

# The M. A. C. Record.

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NUMBER 2.

## Institutes.

### HARRISVILLE.

The Alcona County Institute opened in the court house at Harrisville on Tuesday morning, Jan. 5, with Roland Morrill as conductor and J. Van Buskirk, president of the County Institute Society, chairman. Owing to a combination of circumstances, the attendance was very light at the first session, but better in the afternoon and evening. Mrs. Mayo, as usual, had a room full for the woman's section, and her addresses were fully appreciated. The afternoon session was brought to a sudden close by the announcement of the murder of a prominent farmer of the town, and the subsequent excitement seriously affected the second day of the institute. Considerable interest was shown in the subjects presented by the "outside speakers," but few of the local speakers responded to their names at all, and it was uphill work from beginning to end. The county is in a transition state, no one branch of agriculture predominating; but fruit trees, especially plums and apples, are being set each year in large numbers; and here and there in the county individual farmers are showing that the soil and climate, combined with intelligent management, can be made to yield excellent results.

### ALPENA.

The State Farmers' Institute for Alpena county closed a two days' session this afternoon. The attendance was good at each session, and the interest unabated. The intelligent, progressive farmer is just as much in evidence here as in the lower and older tiers of counties. Prof. A. A. Crozier, of the Agricultural College, was a wide-awake conductor and kept the work constantly up to the top notch. E. O. Avery is the president of the county society, and a hustling presiding officer. Prof. Crozier lectured on "Green Manuring" and "Growing Small Fruits." Plum growing is destined to become a prominent industry in this section. Mrs. Mary A. Mayo, of Battle Creek, lectured before the women's section on "Home Life on the Farm" and on "Mother and Daughter." The ladies of Alpena and pupils of the high school attended the women's section in large numbers. Prof. W. B. Barrows, of the College, spoke on "Insects in the Garden and Orchard." He was kept busy for some time answering the questions fired at him by the interested farmers. J. H. Brown, Detroit, spoke on "The Home Dairy" in the forenoon, and "The Silo: Its Construction," and the "Feeding of Silage to Dairy Cows" was discussed in the afternoon. The discussion of topics was led by such prominent men as E. O. Avery, A. R. Blakeley, Jas. Olds, J. L. Sanborn, L. J. Sylvester and W. L. Churchill.

### TAWAS CITY.

A two days' session at Tawas City of the second annual meeting of the State Farmers' Institute for Iosco county closed this evening; conductor, Roland Morrill, of Benton Harbor. His topics were "Small Fruits for Market" and "Business Methods in Farming." Prof. A. A. Crozier talked on "Green Manuring." J. H. Brown, of the *Michigan Farmer*, spoke on "Dairying as Adapted to Mixed Farm-

ing." Mrs. Mary A. Mayo conducted the women's session as usual. Prof. W. B. Barrows, of the Agricultural College, lectured on "Insects of the Garden and Orchard" and "Parasites of Domestic Animals."

The attendance has been good and the farmers much interested in the various topics discussed. There are many good farms in this section, and hustling, progressive farmers manage them to the best possible advantage. Times are very hard, they all declared, and the farmers deplore the excessive high rate of taxation. John Preston is president and George C. Anschutz secretary of the county society. Among the leading local workers and speakers were Rev. A. C. Kay, J. M. Walker, and John Anderson.

### A Busy Day in the Dairy.

I visited the dairy rooms last Thursday morning and found it a very busy and interesting place. There were seventeen short-course students at work, two of whom were from Amherst College—one a graduate in '93, and the other the Japanese student mentioned in last week's *RECORD*. All were busy; some running the Babcock tester to find the percentage of butter-fats in the milk used; some separating the cream from the milk; others churning, working butter, stamping butter, or attending the ripening vats.

Instructor G. H. True is a very busy man from 8 a. m. to 11 a. m. each day. This is especially true just now, when the students are learning the ways of the dairy. Each student is required to go through the whole process, from testing milk to packing butter for shipment, and he must keep a complete and accurate record of each step in the process. By starting them in sections at different times the instructor is enabled to have all the various operations in progress at nearly the same time.

The student begins with the separating process. After testing his milk for percentage of butter-fats, he weighs the milk he is to use. Then it is run through the separator, and both cream and skim milk are weighed and tested to determine the amount of butter-fats lost in the skim milk.

Next is the ripening process. The cream is put in vats, around which hot or cold water can be run, to bring the cream to the proper temperature for ripening. Four tests of acidity are made during this process.

The following day the cream is churned. Here again, by weighing the butter and buttermilk, and testing the latter, an accurate record of butter-fat losses is kept, so that at the end of the whole process the student can tell just what percentage of butter-fats has been lost in separating and churning.

Then the butter is washed, salted, worked, and put up for market. Some is packed in tubs, and some put up in cakes, stamped with the College monogram and wrapped in oiled paper. Most of the butter put up in cakes is for home consumption. If the cakes are intended for shipment, each cake is enclosed in a wooden box or, more properly, envelope, which preserves the shape of the cake.

Just before 11 o'clock the students are required to wash and put away all dishes and put the dairy rooms in

good order, for the next hour is spent in the veterinary lecture room, where Dr. Grange lectures to them daily on problems intimately associated with dairy work.

The first two hours in the afternoon on Tuesdays and Thursdays these students are instructed in dairy chemistry by Prof. F. S. Kedzie. From 3 to 4 p. m. each day they have stock feeding, and the next hour stock judging. In addition to this they have library work assigned them, all of which makes the dairyman's day a busy and profitable one.

D. J. C.

### Michigan Engineering Society.

The eighteenth annual convention of the Michigan Engineering Society will be held in Lansing Tuesday, Wednesday and Thursday, January 19, 20, and 21, 1897.

"Every person who is interested in civil or mechanical engineering or surveying is invited to attend the convention, bring his lady and take part in the discussions. The morning and afternoon sessions on Thursday will be held at the Agricultural College and an opportunity afforded to visit objects of interest in and about the College." The officers of the society are: President, Geo. L. Wells, Bay City; vice president, Frank F. Rogers, '83, Port Huron; secretary-treasurer, Frank Hodgman, '62, Climax.

This convention will be of especial interest to M. A. C. people, because a number of M. A. C. men appear on the program. Tuesday afternoon Frank F. Rogers, '83, will have a paper on "A Home-Made Testing Machine." Wednesday morning F. E. Skeels, '78, will present a report of the committee on forestry. At the social session Wednesday evening Frank Hodgman, '62, will take part in a half dozen or more selections of vocal music and will also respond to the sentiment, "Our society." Frank F. Rogers will respond to "The Agricultural College: Its Engineering Faculty."

At the College Thursday morning, President Snyder will address the society, and C. C. Pashby, '94m, will read a paper on "Highway Bridge Legislation." In the afternoon John F. Nelligan, with '96m, will present "Roads in Western Michigan," and Instructor A. L. Westcott "Some Notes and Observations." The program is an interesting one, and the sessions should be largely attended by College people.

### Amazing Vitality of Seeds.

P. A. Spicer, of Marshall, Mich., writing to the *Literary Digest* says: "I have no doubt as to the vitality of all perfect seeds under certain conditions. The growth of seeds, under some conditions named would seem at first thought almost incredible; yet I have seen an instance which may appear still more impossible to believe."

"Thirty-nine years ago when Kansas was still a territory, certain lands, in what is now Franklin county, belonging to several Indian tribes, were surveyed, held in trust, and sold by the United States government for the benefit of these tribes. I was one of the first after the survey to examine these lands to select a homestead. There was quite a high hill on the top of

which was a "buffalo wallow," and extending in a beautiful slope from this to Hickory Creek was the land I selected.

"Dr. Isaiah Pile, from Missouri, joined me on the north, and our cabins were erected near each other, on the highest ground. Dr. Pile, after a short time, contracted with certain parties to dig a well near his house. The work proceeded from day to day until at a depth of a little over one hundred feet a limestone rock was struck, but no indications of water. The men hesitated whether to give up the job or to go on; finally, the rock appearing thin, they worked through; and found, to their great surprise, a fine rich surface soil; digging through this they found gravel, clay, and plenty of water.

"The earth which was under the rock, when thrown out, in the course of a few weeks was covered with a rich growth of tropical vegetation.

"There were little date trees and other varieties of palms, besides shrubs, plants, weeds, and grasses in great numbers, all totally unlike anything which grew or could grow in the open air throughout the year in that climate.

"How many millions of years those seeds had been entombed, I leave for the geologist to determine."

### Civil Service Examination.

The United States Civil Service Commission will hold an examination in Washington, D. C., and other large cities where there are applicants, commencing at 9 a. m. on January 27, to fill a vacancy in the position of first assistant in the division of chemistry, department of agriculture. Two days will be required for the examination. The salary of the position is \$1,800 per annum. The subjects of the examination will be as follows:

Essay and report writing.  
French and German.  
General and analytical chemistry.  
Agricultural analysis.  
Industrial and agricultural chemistry.

Persons who recently took the assistant chemist examination, and employees of the department of agriculture, will be admitted to the examination if they file applications.

Persons desiring to compete should write to the United States Civil Service Commission, Washington, D. C., for an application blank and file their application as soon as possible.

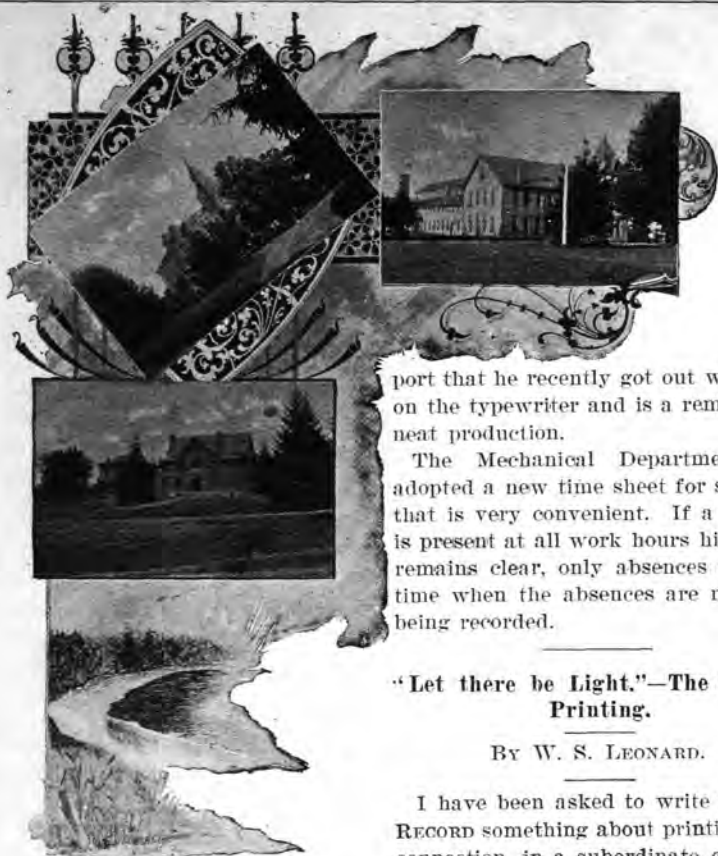
### The Y. M. C. A. and Y. W. C. A. Reception.

A new and promising field of College amusements was entered into at the Y. M. C. A. and Y. W. C. A. reception last Friday evening. One of Howell's farces, "The Mouse Trap," was presented by a company composed of College talent in a manner creditable to themselves and pleasurable to their listeners. The composition is exceedingly humorous and was faultlessly presented. Miss Bristol and Mr. Crosby were leading lady and gentleman respectively, and were ably supported by Misses Monroe, Smith, McGillivra, Phelps and Chase. We bespeak the pleasure of more entertainments of this sort during the winter.

H.

The College is shipping butter in tubs to Chicago.





At the College.

Mr. Hoyt has 39 freshmen in each course in the woodshops.

The Y. M. C. A. held a series of prayer meetings last week.

F. W. Ball, of Grand Rapids, visited his son, Waldo M. Ball, '99, Friday.

Two new lathes were added in the machineworkshops at the beginning of this term.

Quite a number of the Lansing Exchange phones burned out one night last week.

Matt A. Crosby, of Elbridge, has been spending a week with his brother, D. J. Crosby.

Enrollment cards have been taken out by 213 regular students and 43 short-course students.

A disease of the eyes that seems to be contagious, has been going the rounds for over a week.

There are in the Dairy course 17 students, in the Live Stock Husbandry course 14, and in the Fruit Culture 15.

Hon. Rolland Morrill, of Benton Harbor, gave two talks to the juniors and special students yesterday on fruit culture.

Mrs. Landon wishes to announce that the RECORD exchanges will be put in the cases on Friday of each week—not before.

The forcing houses now contain a fine lot of radishes and lettuce ready for use; also tomato plants and cucumber vines in blossom.

Three new students have enrolled in the women's course. They are Misses Kate Nichols, Artie Lockwood and Gertrude Gunnison.

The junior agricultural students have been taking lectures in grafting, preparatory to the practical. They begin practical work in the grafting shop today.

Prof. Philip B. Woodworth is receiving a visit from his father and mother from Caseville. Mr. Woodworth is one of the electors who voted for McKinley and Hobart in Lansing yesterday.

The Union Literary society has presented the library a complete file of *The Union Lit.*, which will be bound. Mrs. Landon respectfully invites the other societies to contribute their publications.

Hon. T. T. Lyon, who is in charge of the sub-station at South Haven, is 84 years of age and has just begun to learn type-writing. The station re-

port that he recently got out was done on the typewriter and is a remarkably neat production.

The Mechanical Department has adopted a new time sheet for students that is very convenient. If a student is present at all work hours his record remains clear, only absences and the time when the absences are made up being recorded.

### "Let there be Light."—The Story of Printing.

By W. S. LEONARD.

I have been asked to write for THE RECORD something about printing. My connection, in a subordinate capacity, with printing-press construction does not warrant a very extensive acquaintance with "the art preservative of arts." The subject is a most interesting one, and worthy of a more graceful pen than I can wield.

It was fitting that the Bible, or portions of it, should have been the first work done with "movable type," and no quotation from the sacred volume could have been more appropriate than the words said to have been the first printed, "Let there be light." Whether or not the tradition be true, these sublime words have certainly proved a splendid prophecy of the conquests of the printing press. This latter observation will be the more apparent if we consider the darkness and superstition of the people who could refer to printing as "the black art," and when we consider further the vast amount of labor required in writing books by hand, what a contrast with the marvellous book-making machinery of the present day.

#### GUTENBERG THE INVENTOR OF PRINTING.

Like other great works, the account of which has been handed down to us through centuries, the origin of printing is involved in dispute. The Chinese have been credited with the invention long before its discovery in Europe; but, if their claim is well founded, it would seem that they cannot escape the charge of having "hid their light under a bushel," for previous to the time of Gutenberg, every book and every public document in Europe had to be executed by the slow process of handwriting.

Even in Europe there were other claimants of the honor beside the reputed inventor; but the bulk of monumental and documentary evidence refers the invention to Gutenberg, and this is not the place to reopen the discussion. If Gutenberg was not the inventor of printing, certain it is that the world is not far wrong in ascribing to him the chief place in connection with this noble art. It was Gutenberg who introduced it to civilization; it was Gutenberg who developed and perfected the art, and made it possible for the common people to own books.

Who does not like to read of the picturesque river Rhine? Here stands Strasbourg with its famous cathedral, Notre Dame. Here stands Bingen, "Fair Bingen on the Rhine." The beautiful natural scenery of the river, its historic memories, its ruined cas-

ties—all lend a tinge of romance and charm to this noble stream. Here in the city of Mentz, about 1405, was born the hero of this sketch.

But little is known of Gutenberg's childhood. He is represented as being serious and devout, and at an early age dominated by a desire to deliver the people from the darkness and ignorance in which they were held captive. Said he, "Let us break the seal which holds the holy things; give wings to the truth, that by means of speech no longer written at great expense by the hand that wears itself, but multiplied as the air by an unwearied machine, it may fly to every soul born into the world!"

A nature pregnant with so noble a purpose could not fail to stamp its impress upon the world. But great and worthy deeds are not accomplished without travail of soul. The law of sacrifice extends throughout nature. If we would be of lasting benefit to our fellows, we may count it inevitable that they will misunderstand and misrepresent us, and "cast us out of the synagogue." The true hero recognizes this, and Gutenberg was not long in learning it. Untold worries, disappointments and litigations awaited him. One form of litigation, however, would seem to reflect discredit upon his character, if we look no further than the meager accounts furnished by the encyclopedias. He was sued by the father of his betrothed for breach of promise. A more candid investigation will absolve Gutenberg from insincerity in this affair. He truly loved Anna Von Iseneau Thur, but, overtaken by misfortune and poverty, he, like many another sensitive nature, hesitated to involve his betrothed in his own increasing troubles. Forced marriages do not generally conduce to happiness, but this case was an exception. Despite this untoward circumstance they lived together in mutual affection and peace.

#### ENGRAVINGS AND STENCILS USED LONG BEFORE MOVABLE TYPE.

We make a distinction between engravings, stencils, et cetera, and "movable type." While it might seem but a step from one to the other, technically the difference is an important one. Seals and engravings had been used to a limited extent centuries before the time of Gutenberg; and he investigated with deep interest these methods of duplicating impressions on paper. On one occasion he was sitting by his fireside absorbed in the examination of a playing card. Anna, observing his interest, said in a pleasant way, "Prithee, John, what marvel dost thou find in that card? One would think it the face of a saint, so closely dost thou regard it." "Nay, my little wife; but didst thou ever consider in what way this is made?" "I suppose it was drawn in outline, and then painted like other pictures." Gutenberg explained how the image had been made from a wood engraving, and also told her of the "Biblica Pauperum" which he had seen in the cathedral. The Biblica Pauperum consisted of forty pictures illustrating Bible events and accompanied with written explanations.

"And canst thou not make a Biblica Pauperum?" asked Anna. Encouraged by his wife's interest, Gutenberg engraved some simple letters and pictures, saying, "It remains that I try thy name, my Anna. I cannot fail to engrave that name on wood which has been so long traced on my heart." Thus saying, he wrote his wife's name on a block and cut the wood away between the lines, leaving the name in re-

lief. He then moistened it with ink, and gently pressing the engraving upon a bit of paper, made a clear imprint of his wife's name. She was delighted, and warmly praised his skill, at the same time prophesying great things for the new art.

Hitherto, engraving, with the exception of simple monograms and seals, had been applied exclusively to pictures. But Gutenberg had now conceived a more extensive and valuable application of this art; and ere long we find him making full pages of reading matter from engravings on wood. He had associated with him three other artisans in that craft, and such was their success that Gutenberg conceived the idea of printing the whole Bible. Anna greatly encouraged him in the enterprise. "All thou wouldst have to do," said she, "would be to make more blocks,—a block for a page. A monk can write only two Bibles in a long life-time, and printing from blocks is much greater speed than that."

They were both greatly disappointed when he computed 30 years as the time required to engrave blocks enough to print the whole Bible. Time and money alike would fail him in the accomplishment of so arduous a task, and his partners had already complained of the labor and time involved in the small works which he had published. Nevertheless he prevailed on them to attempt the Gospel of Matthew; and one day when Gutenberg had nearly completed a page a slip of his chisel split the block asunder. His partners upbraided him with this great loss, and he endeavored to fit the block together in such a manner as to save the greater part of the finished work.

#### THE FIRST CONCEPTION OF MOVABLE TYPE THE RESULT OF AN ACCIDENT.

While cutting away the few damaged characters, and fitting in new ones, he conceived the idea of making separate type. He was quick to see the great value of this expedient. Having printed one page, he could reset the same type and print a second and third page, and so on. Not only could he use the same type on different pages of the same book, but after once making a complete outfit of type he could print any book. Of course it would require more than one of each character; but still the labor of making a sufficient quantity of separate type would be incomparably less than if each page of every book had to be engraved in full. And besides, errors could be more easily corrected in the separate type system.

Thus did Gutenberg reason, "Thus did the patient hero seize upon the idea of 'movable type'—the keystone of the art of printing." But this was only the conception. The process of making separate type, though apparently simple, was attended with great practical difficulties.

When all the characters of a page were engraved on a single block it was easy to get a true face. Also the form thus made was substantial and compact, requiring no apparatus to hold the type together. But new problems had to be solved when the "movable type" system was adopted. It was tedious and difficult to accurately size the separate type and more difficult to bind them together in such a manner as to present a square and true face to the material to be printed upon. Bitterly did his partners, whose chief ambition was money-getting, complain of his long-continued and costly experiments. Often did they threaten to leave him to fight his battles alone. Even his faithful Anna, hitherto hopeful, began to show despondency. She had left her



patrician home, where she knew nothing of want or worry, and had, by the course she had taken, involved herself in trouble as well as increased her beloved John's cares. She reproached herself for encouraging him in his visionary schemes, which she feared would end in his being imprisoned for debt. To soothe her Gutenberg named a day when, if prospects were not more favorable, he would temporarily abandon his experiments and return to his trade of lapidary, which he had learned in his youth.

But the tide again began to turn in Gutenberg's favor. One by one the difficulties were overcome, and soon he was able to show a complete font of type firmly and accurately held in a square frame, and presenting as true a face as if made in a solid block. Anna took courage, his partners grew more hopeful, and his creditors, hoping for a large share of the results of final success, granted him further aid.

Hitherto the actual printing had been done in the crudest manner possible. Gutenberg now contended for some sort of press for this purpose. His associates assenting, he set out to devise a press, and after numerous experiments and failures, and just as his supporters were again ready to give up, he settled upon a successful design, which was completed without further trouble.

#### A PERIOD OF TRIAL AND DARKNESS.

Having the type and the press, they now began to do actual printing once more, and it seemed that they would soon reap substantial reward for the years of toil and disappointment. But alas! further troubles awaited them. A brief experience proved that wood was not a suitable material for the type. The ink softened it and caused it to make blurred letters. When his principal partner first noticed this he was overwhelmed. "It is my mind," said he, "that the bubble has burst. We may as well give up." To add to their troubles, one member of the firm died, and his heirs entered suit against the surviving members. The particulars of the inventions had hitherto been known to only a few trusted friends. Now there was danger that all would be made public by the necessity of legal inquiry into the company's affairs. Poor Gutenberg! What would he do next? He could no longer continue his experiments; all his time was taken up in connection with the legal proceedings. As in the exigencies of war great treasures are sometimes destroyed to prevent them from falling into the hands of the enemy, so Gutenberg finally deemed it expedient to destroy every vestige of type and press. What a pathetic spectacle! What grief, what heartaches, he must have felt as he consigned to the flames the result of years of consecrated genius!

We will not discuss the ethics of this transaction. He felt that God had intrusted him with the introduction of printing, and though all seemed lost, he hoped it would yet, he knew not how, be brought to a successful issue.

The trial aroused much fanaticism, and Gutenberg was accused of being in league with the devil. "What superstition!" exclaimed he. "This comes of ignorance and the scarcity of books." The nature of his experiments was known previous to the trial, but the processes were not understood. Neither were they disclosed during the progress of the case; and while the verdict was in his favor, the trial left him overwhelmed with debt and prejudice. The prejudice was the more pronounced because of his efforts at se-

crecy respecting his art—"the black art," so called.

What will Gutenberg do in this hour of darkness? Will he give up in despair? Will he acknowledge defeat? No, such is not the character of our hero. There is a great work to be accomplished. God has looked among the sons of men and chosen Gutenberg for this work, and "the gates of hell shall not prevail against it."

As intimated, Gutenberg had learned the trade of lapidary—a very lucrative one. He now betakes himself to this calling, resolving to give every florin beyond the barest necessities to his creditors. And so he toiled from week to week, and from month to month; but when the day's work was done he would spend the evening hours in cutting type, ever faithful to the conviction that he was to be instrumental in spreading knowledge among the people.

#### SCHOEFFER AND FAUST.

All Gutenberg's experiments had been carried on in Strasbourg, whence he had fled while a young man on account of his political opinions. Here he still resided, and it was here that he first met Peter Schoeffer, who was destined to play so conspicuous a role in the introduction of the new art.

It was not long before he had cut another font of type, but the prejudice against him was so great that it was useless to attempt any important printing in Strasbourg. A score of years had passed since he left Mentz, and believing that it would be safe for him to return, he again took up his abode in his native city. Emily Pearson, from whose writings I have liberally quoted, describes with much pathos Gutenberg's return to the scenes of his childhood, but there is not space for such reflections here.

While plying his trade of lapidary in Mentz he became acquainted with Faust, another name famous in connection with the development of printing. Faust was a wealthy capitalist, and quick to seize upon the new art as a promising investment. He supplied means to start printing on a large scale, securing himself by a mortgage on the equipment. He also became a partner in the business with Gutenberg, and the new firm soon issued some very creditable productions. Among these were the "Doctrinale" and a "Manual of Grammar."

#### METAL REPLACES WOOD IN THE MANUFACTURE OF TYPE.

As the work proceeded, Gutenberg encountered his old difficulty of the softening of the type, and substituted lead for the wood. But he still continued the slow process of cutting the type. The lead proved but little better than the wood, and further experiments were necessary. Peter Schoeffer, the designer, had been admitted to the firm. Schoeffer was not only a designer, but also somewhat of a metallurgist. He suggested a "mixture of regulus of antimony and lead," which was soft enough to cut, and yet sufficiently strong to stand the impression. This was an important step in the process of the art and was soon followed by another important improvement, viz., that of casting the type instead of cutting it.

Gutenberg had experienced difficulties from the first with unsuitable ink. The firm now began experiments to discover a mixture that would obviate these difficulties, and finally settled upon lamp-black and linseed oil, which gave excellent results. In the meantime Gutenberg had improved on the old press which was destroyed at Strasbourg, and the firm felt encour-

aged to attempt the publication of the Bible. This work was begun in the spring of 1450; but it was not until five years later that the first copy of the famous Mazarine Bible was completed.

About this time Faust became dissatisfied with Gutenberg's management and sought to retire him from the firm. Litigation followed, ending in the complete financial ruin of the inventor. One of the legal documents connected with the case begins as follows:

"To the Glory of God. Amen. Be it known to all those who see or read this instrument, that in the year of our Lord 1455, third indiction, Thursday, the sixth day of November, the first year of the pontificate of our Holy Father, the Pope Calixtus III, approved here at Mayence, in the great parlor of the Barefooted Friars, between 11 o'clock and midday, before me, the notary, and the undersigned witnesses, the honorable and discreet person, James Faust, citizen of Mayence," etc.

When the verdict was finally pronounced which transferred the whole plant, type and presses to Faust, Gutenberg was well nigh heart broken. For a time he was oblivious to his surroundings. His noble Anna, who had grown strong in the school of adversity, soothed and quieted him until he regained his self-possession. Like a ministering angel she spoke to him of the meekness and patience of Christ, and bade him cast his burdens upon Him, "without whose notice not even a sparrow falleth to the ground."

Having rid themselves of Gutenberg, Faust and Schoeffer hastened the work of printing the Bible, and Faust visited Paris and sold a large number. The king purchased the first copy for 750 crowns; but the price was rapidly reduced until a Bible could be bought for six crowns. All Paris was aroused by this mysterious new art; and soon the old cry of witchcraft was raised. Doctor Faust was summoned to appear in court and answer the charge of being in league with Satan. "May it please your honor, it is not the black art I practice, but the art of printing." As he proceeded with his defense he gained the sympathy of the people, who shouted, "Vive le Docteur! Vive le Docteur!" The excitement soon subsided and the accused was honorably discharged.

Encouraged by success, Faust soon published other works, among which was "Cicero de Officiis" in Greek type. This was much prized by the professors at the university, and on his second visit to Paris he was received with great enthusiasm. Alas! in the midst of this enthusiastic reception Faust was seized with the plague and died in a few hours.

The death of Faust made a deep impression upon Schoeffer. It is said that he had repented of the part he had taken against Gutenberg, and sought and obtained reconciliation. Nevertheless, he continued the business as before, and issued various publications up to 1502, in which year he died.

Never did Gutenberg give greater evidence of his consecration and magnanimity than after his desertion and prosecution by Faust. While the latter was in the zenith of his fame Gutenberg expressed gratitude that the work that he, Gutenberg, had planned was being so ably executed by Faust. Thus it ever is with the heaven-sent hero. He is willing to die unknown, and his deeds unsung, if the mission of his life may still be accomplished. The mere time-serving worldling, however talented he may be, understands not the philosophy of such a life. Inapt with the swaddling clothes of a selfish spirit, this higher life is to him as an unexplored country.

After a time Gutenberg, aided by admiring friends, once more took up the work so dear to his heart. But great were the difficulties he encountered. He had not only to start at the bottom again, but had to compete with well-established and powerful rivals. To further add to his difficulties, Schoeffer had carried with him the formula for the type mixture. The lack of this necessitated further experiments on the part of Gutenberg. Nevertheless he had succeeded in publishing some works of importance when death claimed his faithful wife. Alas for the struggling hero! This was a greater grief than any he had yet known, and he did not long survive her. But it was enough. He had lived to see books in the homes of the common people; and as his name was in the "Lamb's Book of Life," he must needs be summoned to the supreme tribunal to receive the plaudit, "Well done, good and faithful servant."

(To be continued.)

## 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

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# The M. A. C. Record.

PUBLISHED WEEKLY BY THE

MICHIGAN AGRICULTURAL COLLEGE

EDITED BY THE FACULTY,

ASSISTED BY THE STUDENTS.

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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.

The RECORD has received volume V, No. 1, of the *Asa Gray Bulletin*, which is edited by Miss Constance G. Du Bois, Waterbury, Conn.; Mr. G. H. Hicks, '92, Washington, D. C.; and Prof. C. F. Wheeler, '91, M.A.C. The bulletin is devoted to the science of botany, and numbers many eminent scientists among its contributors. It is published by W. Roscoe Kedzie, '98, of the Agricultural College, is neat and attractive.

Our thanks are due Superintendent of Public Instruction Hammond for a neat little booklet commemorative of the 60th anniversary of the statehood of Michigan. The souvenir contains a history of our State, a study of its nomenclature and resources, together with discussions of other related subjects by Senator McMillan, President Angell, ex-Gov. Rich, and Gov. Pin-gree. We heartily support the author's hope "that the spirit of pride in our native state may thrill through all our hearts and result in practical work for its future advancement."

## The Governor's Message.

Governor Rich, in his retiring message, makes several recommendations that are of especial interest to readers of the RECORD. Three of these we take the liberty to publish:

### FARMERS' INSTITUTES.

"The \$5,000 appropriated by the last legislature for each of the years 1895-96 has all been expended, and institutes held in practically all the counties of the State. That they have been popular is shown by the increased demand for institutes in 1896, over the previous year, and it is reasonable to suppose a large amount of valuable information has been disseminated in this way. I would suggest in this connection that not only professors from the Agricultural College and practical agriculturists be secured to deliver talks at these institutes, but those from the University, as well, who can teach sanitation, physics, plumbing, drainage, rudiments of law, and such other matters as may be instructive and valuable to those in attendance. The State Board of Health could also furnish lecturers who could give much valuable information in relation to the preservation of health, and the prevention of diseases, especially of communicable diseases. This would not only be the means of a general diffusion of much valuable knowledge, but it would bring the people of the State and these institutions and boards clos-

er together, give each a better understanding of the others, and be valuable in many respects.

### FORESTRY.

"Michigan, once covered with a wealth of forest, has been almost completely denuded, and much of the land from which the timber has been stripped, is of little value for cultivation, especially in these times when even good lands will hardly pay the expense of cultivation. There are still some forests left, and much of the land could be utilized in the production of valuable timber in the future, as well as for the preservation to some extent of game and fish. This could very properly be placed under the general direction of the commissioner of the State land office, with perhaps some assistance from the State Board of Agriculture, who have under their charge quite a large body of land yet unsold. This would in a few years prove of great benefit to the State, besides assist in reclaiming vast tracts which have become practically desert. Foreign countries are much ahead of us in this respect, as are the New England states. The times are hard for making very much of an appropriation, but a moderate appropriation looking to some plan for finally establishing a forestry department of the State is well worthy of your earnest consideration.

### STATE AGRICULTURAL COLLEGE.

"This College continues its high rank among the other agricultural colleges of the nation. There have been some radical changes made, which promise to increase the usefulness of the institution, although they have been on trial too short a time to determine definitely what the result will be. It does seem, however, that an institution so well endowed, and affording such a wide range of opportunities for education, should be more liberally patronized by the great agricultural classes of our State. It would seem that they do not fully realize the great advantages to be obtained here, or the attendance would be larger than it now is, or ever has been."

## Care of Farm Machinery.

[Read before the Farmers' Institute at Cassopolis by H. Cobb, of Edwardsburg.]

The subject of the care of farm implements is one considered on many farms as being of little importance. But if so considered, we should remember that the small things of life go to make up the great ones; if we could know the exact amount of money wasted each year by the farmers of this country, through neglect in caring for farm implements, the most of us would be astonished.

Riding along the country roads we see a hundred dollars in the form of a binder going to waste lying in the corner of the field, in another field is a mower, cultivator or plow in the same condition, and all because of the neglect of the farmer to put them in their proper places when through using them. During the time an implement is lying idle it may receive more injury than while in actual use.

Who can say how much is taken from the value of a farm wagon in a single season through exposure to the hot sun and rain which comes upon it if left unsheltered? Yet it is noticeable how soon such a wagon becomes useless, paint gone, iron work rust eaten, and every part weakened or ruined. The man of means may invest in the most fertile farm in the land, he may equip it with the most improved implements

and procure the best seeds and plants to be found, but if he pays no attention to the less important details of the farm, his investment will not pay in a financial way at least. On such a farm the tools used are certain to lie in the field, exposed to the weather, uncared for. And how comparatively easy it is to stop this waste. There is no farmer so poor but that he can afford some kind of shelter for his farm implements. It surely is not economy to leave these unprotected for any length of time, since they become useless by so doing, and it becomes necessary to procure new ones when the old ones should still be in use. Then, after the shelter is provided, care should be taken to thoroughly clean and oil the bright parts of each tool as it is put in its place.

Not infrequently it costs the farmer ten times as much time as it should to get his plow to work properly the first day he starts it, all because he neglected to oil the mold-board when he laid it by; and at the close of the day he is neither satisfied with the quality nor the quantity of work done.

When the binder is stored away, the sickle should be removed, oiled and placed as far from moisture as possible; the edge of the sickle is very delicate, it may be injured more by rust in one season of idleness than in two seasons in actual use.

Many machines that appear to have passed their days of usefulness may be repaired and adjusted so as to give good use for several seasons. As an example of this, there is a case of my own. My binder got in such a condition that it would not bind one bundle in a hundred. I found by investigation that one strand of the twine passed outside of the fingers that forms the knot; when the twine was cut this strand pulled out of the knot and left the bundle unbound. I related the trouble I was having with my binder to several that were using or had used the Appleton binder, but none of them could tell me what to do for it. All agreed that the binder was worn out, and I began to think so myself, and yet I could not but think the knoter could be made to work if properly understood and adjusted, for surely nothing was broken. I finally concluded to make one more effort to adjust it. I found that the notch in the cam that should hold the twine in line with the fingers was so far back that it threw one strand of the twine, and sometimes both, outside the fingers. I soon found that the plunger bolt controlled this cam, and, after loosening the set screw that held it in place, I turned it three or four times around to the right; this brought the notch in the cam in line with the fingers and carried the twine to its proper place. I have cut twenty acres of grain with it since and it works as well as it ever did. I came very near buying a new binder, and now I am satisfied that it will last five or six years yet. I relate this circumstance to show that we sometimes condemn our implements without giving them a fair trial.

But there is another side to this question; it is not economy to spend time and money in repairing an implement that is sure to give out just when it is most needed. We should use judgment, and not undertake to repair an implement that is comparatively worthless.

When the farm implements are put away it is well to take notice of any needed repairs and when the winter season comes on, time can conveniently be used in making them.

It is very important to keep the burs turned up tight on all bolts in the farm implements. Many break downs have been caused and much time lost by this neglect alone.

It pays to keep the farm implements painted. One or two coats of paint each year on the wagon felloe will save four times its cost in blacksmith bills in resetting the tire, besides the preservation rendered the wood. A good, durable and inexpensive paint for this purpose can be made by using one part red lead to three parts of Venetian red.

Too much care cannot be used in oiling farm machinery. Many of the journals are placed near the ground and necessarily have to run in the dust and dirt, causing extra wear, besides the tendency to fill the oil holes in the boxes; and unless the operator is very careful about opening them the journals will not receive any oil. Thousands of dollars' worth of farm machinery are ruined each year entirely through neglect in keeping it properly oiled. For the purpose of oiling machinery, good oil is more economical than poor, cheap oil. The harness should be cleaned and oiled at least twice a year. For this purpose I have never found anything as good as cotton-seed oil. It renders the leather soft and pliable and will not crack it in the least.

Keep the tools and farm machinery in perfect order. By so doing we make an economical use of power as well as muscle. The use of power always costs money, and too great a use of muscle always causes fatigue, and fatigue in either man or beast always causes the work to lag.

## To Save the Forests.

HON. C. W. GARFIELD SOUNDS A NOTE OF WARNING.

"Legislation cannot solve all our problems, and I have little sympathy with people who expect to secure a perfect condition of society through legal enactments," said Hon. Charles W. Garfield this morning. "But there are some important steps of progress involving the rights and betterment of many generations of people, which will hardly be undertaken by individuals. I have in mind now the conservation and development of forests.

"In our own State the destruction of forests has been indulged in so long, and with no thoughts beyond the immediate income from the marketable products, that an area of lumber is rarely looked upon except with a view of measuring its marketable value. The trees were in the way of the pioneer who came here to hew out a career, and he treated them as a common enemy, and literally 'fired' them out of existence. Lumber products were of so little value in the early days that the lumbermen cut only the best stock and left the balance to stand and dry, becoming tinder for the first spark of fire, and a menace to all the good timber in the neighborhood. This has resulted in the most gigantic waste this State has ever known. Hundreds of thousands of acres of land in the north half of the lower peninsula of this State bear witness in desolation to this terrible and ruthless destruction.

"The State is rapidly acquiring title to immense areas of this land; add to these the possessions it has never parted with and the trust lands held for public institutions, all of which have no care beyond the occasional collection of a serious trespass, and we have a surface representing a great



value if it could only receive the care an individual would give his land.

"The lumberman when remonstrated with for his careless methods and the danger he incites through his slovenly ways of removing the timber, asserts that he cannot afford to clear up after the choppers. If he should remove all the waste there would be no money in his business, and because he can do as he will with his own he practically is responsible for the great menace to his neighbor's possessions. There may be some truth in this, still the large fortunes that have been taken out of Michigan woods testify strongly against this defense of the reprehensible practices which have prevailed in the removal of our grand heritage of pine. But with the selfishness that is inherent in mankind, we cannot expect the average man to think much about his neighbor. It is too expensive a luxury. We certainly have no reason to expect reform in the management of forest clearing to begin with small owners. Large owners have never in our State shown any disposition to adopt a policy that will not give immediate returns.

"But the State can do better. It can take a long look ahead and by a careful policy in the management of its waste lands add immensely to its wealth simply by saving from destruction what is now valuable in timber and by ordinary methods of protection allowing nature to again cover the burned areas with a growth of timber. The simplest elements of economy should dictate this policy. The proper use of the fallen trees and the wise cutting of mature timber would, in the hands of business men, furnish ample means to protect the growing forest on a major portion of the State lands, and thus, without expense, the State could grow into wealth by simply protecting nature in her work of rehabilitation.

"It is admitted by the most competent foresters that work of this kind can only be accomplished with holdings in large quantity under one management. One has only to look at the maps in the State Land Office upon which are registered the descriptions of lands that have reverted to the State from owners who have swept off the valuable timber, to see how Michigan fulfills this condition.

"The auxiliary questions of protecting hillsides from waste; utilizing land of no agricultural value in growing timber; holding back the waters of our streams and preventing destructive freshets; protecting our agricultural values by maintaining proper climatic conditions which are conserved by keeping a certain portion of the surface in forest, and the protection of our game, are all connected with the one, of what shall the State do to protect its own lands and enhance their value?

"There is no question that can come before our legislature of greater importance than this. The matter of cutting down the appropriations asked by our public institutions in the interests of economy, sinks into insignificance when compared with this. The annual loss by neglect would care for them all. Michigan cannot afford to let this go any longer. It should at least recognize the steps taken by New York, Ontario, Wisconsin and Minnesota as indicative of what it should do, and hasten to check the worthless destruction which in no state has been so manifest as in our own.

"What shall the legislature do? Well, I have no formulated plan; but a thrifty landholder, under like circumstances, if he did not know what to do

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would secure the services of some one who did to work out his problem. It is not to be expected that in our legislature there will be one member who has distinct ideas of the best method to pursue, but it is to be hoped that there may be some one who shall comprehend the importance of the problem.

"We have a land office with all the equipment for carrying on a work of this kind. Add to this the services of some man or men who have been educated for this kind of work and there need be no time wasted in getting at it. New York set a good example in the selection of a commission to look over the Adirondack region, study the situation and make recommendations for the state upon which it acted promptly.

"Michigan might do well to begin the solution of so great a problem by having a commission selected to gather information concerning the needs and through a presentation of the methods pursued elsewhere that have been successful, settle upon a policy that would be wise and of long duration.

"I know the mere suggestion of such a plan would be met at the outset by the criticism, 'Oh, yes, you are just like all the other fellows, arranging for more offices.' All I have to say in reply is to call attention to the method of the wise lumberman when he is about to purchase an area of timber. He does not put it off because he does not know how much timber there is on the land; he does not trust his own judgment unless he is an expert, but he employs a competent woodsman to estimate the value of the timber, and upon his report he bases his judgment concerning the purchase. The State cannot afford to adopt a less careful method than an individual in caring for its property.

"I certainly hope the press of the State will take up this important matter and help to awaken an interest commensurate with the importance of the large amount involved.

"Incidentally, I might say that the query raised by the *Evening Press* not long ago with regard to the destruction of our game could be completely solved in the establishment of a forest preserve of several townships wherein animals could not be hunted, and in which they would be safe in nurturing their young. Other game restrictions with this established condition would be unimportant."—*Grand Rapids Evening Press*.

Among the visitors at College last week were the following representatives in the State Legislature: William J. Oberdorfer, Stephenson; George W. Rulison, Hancock; George E. Gillam, Harrisville, and John Caldwell, Man-  
ton.

#### Dendrobiums Growing Upon Bones.

A writer in the *Gardners' Chronicle* says he recently came across "a remarkable instance of an orchid growing upon the skull of a sheep, the species being *Dendrobium Parishii*, which from the size of the old pseudo-bulbs, was a very small piece when fastened to the skull. This is its second year of growth, and the length and stoutness of the new pseudo-bulbs, the extensive network of roots around the jaw bones and teeth, in and out of the eye-sockets and other indentations of the skull, show plainly that the bone suits requirements. Equally luxuriant is a plant of *D. pulchellum* growing on the skull of a dog; where in general instances the bulbs usually attain a length of three or four inches, the plant under notice has this season made bulbs approaching seven inches in length. This information may at the present time be all the more interesting, as it will materially strengthen the arguments put forth by Doctor Kedzie, of Michigan Agricultural College, that the growth of epiphytal orchids is stimulated by their absorbing mineral matter through the agency of their roots."

#### Why Stick in the Mud.

During the holiday week and since then the condition of the roads near the College, and probably all over the State, has been wretched beyond expression. Terrible, impassable, knee-deep mudstreaks are they, almost without exception. The query arises, do not poor roads help make hard times? And would not all classes of business men, merchants, farmers and others, do well to consider the effect of this little stretch of unfavorable weather on their profits. Probably an expenditure of the combined losses for a few years would be sufficient to provide paved streets in the more thickly populated districts,—surely broken stone surface for nearly all roads. And the effect of such rains as we have had upon the perfect road would be what? Why, simply to wash it nice and clean, saving the expense of cleaning it some other way. If every man will honestly answer the question, "How much do bad roads cost me," good roads will not seem so costly and impossible, even in hard times.

#### Weighing Living Fish.

A visitor at the aquarium who had wondered how they managed to get the weight of a live fish accurately, learned that that was really a very simple thing to do. The fish is put into a pail of water, which is weighed with the fish in it. Then the fish is taken out and pail and water are weighed without it.—*New York Sun*.

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#### Report of Football Manager.

Following is the expense and receipt account of the foot ball team for 1896:

Expenditures—	
Postage .....	\$0 67
Telephone .....	1 37
Bus and street-car fares .....	11 85
Board .....	18 70
Advertising .....	8 50
Elton Park .....	3 00
Railroad fare .....	86 10
	\$130 19
Receipts—	
Gate .....	\$29 19
From faculty .....	31 50
From Athletic ass'n ..	55 00
	\$115 69
Indebtedness .....	\$14 50

S. J. REDFERN,  
Foot Ball Manager.

The dairy is now purchasing 800 to 850 pounds of milk daily for use in the laboratory. Through the courtesy of the Lansing Condensed Milk factory we are enabled to get the milk from one of its regular customers, Mr. Stewart, who lives near the North Lansing road.

If you have plenty of good points about you the world won't sit down on you very hard.—*Ex.*



## News from Graduates and Students.

S. L. Ingerson is again in College.

C. D. J. Beck has returned to College.

R. M. Bates, '83, was in the city Friday.

C. A. Jewell, '96, visited the College Friday.

F. H. Smith is again with us as a student.

Fred P. Clark, '93, was in Lansing last week.

Frank J. Porter, '93, is farming in Leelanau county.

C. J. Strang, '78, & Sunfield, visited at M. A. C. Saturday.

F. C. Wells, with '73, is a practicing veterinary surgeon at Warren, Mich.

L. C. Smith, with '97, has returned and expects to graduate with '99.

Wahey Matsura, '96m, sailed for Japan from San Francisco the 29th ult.

Jason Woodman, '81, is lecturing in the interests of the Grange in Oceana county.

C. H. Spring is among the old students who have returned to take up college work.

D. McArthur, of Cass City, a brother of D. D. McArthur, '94, is taking a special course.

Geo. Swift, with '97m, is married and has a carpenter and cabinet shop in Harbor Springs.

We are glad to announce that D. W. Trine, '92, has recovered from his recent severe illness.

Dwight S. Cole, '93, is one of the recently-appointed clerks in the auditor general's department.

Wendall S. Paddock, '93, of the Geneva experiment station, N. Y., visited M. A. C. the early part of last week.

E. D. A. True, '78, is taking special work in the Mechanical course and his wife is enrolled as a short-course student.

F. W. Lewis, with '94, has just finished the work of his course and has been granted a diploma with the degree B. S.

L. C. Brooks, '92m, left Saturday morning for Schenectady, N. Y., to accept a position as draughtsman for the General Electric Company.

Mrs. R. S. Baker, '91, leaves for her home in Chicago today. She will be accompanied by Miss Lillian Wheeler, '93, who will visit in Chicago.

L. B. Hall, '84, has moved from Belding to Saginaw. He has recently been made district manager for the New York Mutual Life Insurance Company.

William Greiner, with '98, will talk on the Michigan Agricultural College at the Teachers' and Patrons' Association in Elbridge, Oceana county, next Saturday.

Married, at the residence of the bride's parents, Hennepin, Ill., November 26, 1896, Florence M. Cecil, to John P. Church, with '91. Mr. and Mrs. Church reside at 2428 Indiana avenue, Chicago.

C. B. Smith, '94, writes from Washington that the New Year finds him unusually happy over a substantial and wholly unexpected increase in his salary. He further says "Frank Hall, '88, has been promoted to the position of Expert Agriculturist with a salary of \$1,500 per year."

A letter from A. R. Rogers, with '97, says: "My brother, J. R. Rogers, with '90, and myself are farming on the home farms. He is devoting his time to horses and to the office of town clerk, while I am at the more profitable business of general farming." The Rogers brothers live at Lime Creek, Michigan.

## 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.

Shakespeare Club—Meets every Wednesday evening. Dr. Howard Edwards, 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. T. A. Chittenden, President. A. J. Weeks, 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 Pearl Kedzie, President. Miss Hattie Chase, Secretary.

Hesperian Society—Meetings held every Saturday evening in the society rooms in the west ward of Wells Hall at 7:00. A. T. Cartland, President. D. E. Hoag, Secretary.

Olympic Society—Meets on fourth floor of Williams Hall every Saturday evening at 7:00. W. R. Goodwin, President. E. R. Russell, Secretary.

Phi Delta Theta Fraternity—Meets

on Friday evening in chapter rooms in Wells Hall, at 7:00. H. A. Hagadorn, President. C. M. Krentel, Secretary.

Union Literary Society—Meetings held in their hall every Saturday evening at 7:00. G. A. Parker, President. F. W. Robison, 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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## New Books in the Library.

Allen, Commercial organic chemistry, vol. 3, pt. 3.  
 D'Anvers, Art guide to Europe.  
 Annals of Botany, vol. 9.  
 Amer. Florist, vols. 10, 11.  
 Amer. Gardening, vols. 16, 17.  
 Abbott, Principles of bacteriology.  
 Berensen, Venetian painters of the renaissance.  
 Berensen, Florentine painters of the renaissance.  
 Bureau of Enthnology, 13th annual report.  
 Birch, Life of Robert Boyle.  
 Burbidge, Cool orchids.  
 Britton & Brown, Illus. flora of the northern U. S. and Canada, vol. 1.  
 Bryant, Business man's commercial arithmetic.  
 Bunner, "Made in France."  
 Conant, The number concept.  
 Child, Delicate feasting.  
 Church, Food.  
 Crafts, Practical christian sociology.  
 Campbell, Easiest way in housekeeping and cooking.  
 Diet. of national biography, vol. 47.  
 Des Cars, Pruning.  
 Drinkwater, Lives of eminent persons.  
 Edwards, Barbara's history.  
 Ewing, Art of cookery.  
 Edwards, Differential calculus.  
 Edwards, Integral calculus for beginners.  
 Emerson, Essays, 2d series.  
 Emerson, Lectures and biographical sketches.  
 Emerson, Miscellanies.  
 Emerson, Natural history of the intellect.  
 Frederic, Damnation of Theron Ware.  
 Flint, Physiology of man, vols. 2, 5.  
 Filippini, The table: how to buy food, etc.  
 Field, Field flowers.  
 Fawcett, Agnosticism.  
 Fowler, Portrait and figure painting.  
 Gibson, Our edible mushrooms and toadstools.  
 Gardner, Hand-book of Greek sculpture.  
 Groesbeck, Crittenden's commercial arithmetic.  
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