

The M. A. C. Record.

VOLUME I.

LANSING, MICHIGAN, TUESDAY, FEBRUARY 25, 1896.

NUMBER 7.

MECHANICAL ENGINEERING AND AGRICULTURE

PROF. C. L. WEIL.

In the catalog of one of our large technical schools you will find noted that the mechanical engineering student of this school elects at a certain point in the course of his work whether he will make a specialty of mill, marine, or locomotive engineering. We note, that the locomotive is considered by some of our foremost engineering educators as furnishing a field of work large enough for many individuals. There is a tendency today to specialize all professional work.

Up to the present time, however, little or no effort has been made in this country, to train specialists in the designing, construction, and so on, of agricultural machinery. Courses in agricultural engineering are maintained, but such courses offer work more closely allied to that of the civil engineer than any other branch of engineering—that is, work in land surveying, methods of irrigation, drainage, etc.

Does not the need exist for a quite extensive course, in some of our agricultural colleges, of such a nature that young men may be trained in what might be called "Mechanics of Farm Machinery?" We propose the consideration of a course at our colleges in which the student shall be trained to understand not only the principles underlying the proper construction and design of farm machinery, but also the needs of the farmer, with regard to machines by practical experience with such machines.

The need for men trained as above mentioned is certain to increase, and not only is there a field for such men in the shops and draughting rooms of agricultural machinery concerns, but also on large farms and plantations. An officer of a state institution, where instruction is given in both agriculture and mechanical engineering, states that on visiting a prominent agricultural machinery manufactory, he found three of his former students doing designing work that served to keep employed a force of 1,800 men.

Farm work often demands machinery of quite intricate nature as far as mechanism is concerned—machinery that seemingly thinks for itself. We need men who have been carefully trained on both the agricultural and mechanical sides who shall devote themselves to perfecting and cheapening farm machinery.

Some will say, after reading the foregoing, that there is much farm work which could never be done profitably by machinery, but we know that an immense amount of work of varying nature was accomplished during the past year with the aid of machinery, concerning which work similar remarks were made twenty years ago.

Mechanical Department.

THE "ROUND UP" INSTITUTE.

Agricultural Section.

The closing institute of the series held by the State Board of Agriculture opened at Grand Rapids Tuesday night, Feb. 11, and continued in session until Friday night.

In addition to a large attendance from Kent county, there was a good representation from other parts of the state, including delegates from county institute societies of twenty-five counties.

The main session of the institute was held in Lincoln Hall, while a Mechanics' Section met upon two evenings in the Y. M. C. A. building, and there was a Women's Section held at the same place upon three afternoons. Among other attractions, the exhibit of dairy machinery in actual operation was not the least. It was under the immediate charge of Mr. G. H. True of the College, and included a Babcock tester, a separator, power churn and butter worker. It afforded an excellent illustration of the workings of a large dairy, 1,000 pounds of milk being used each day. The other exhibits included seeds and grains, weeders and cultivators, patent fences, and spraying pumps and outfits in variety. In the main hall there was a carefully selected exhibit of apples, most of them shown by M. Nelson of Menominee.

On Tuesday evening, after an address of welcome, Gov. Rich spoke upon the State Institutions and State Appropriations. He explained the duties of some of the newly created state officials, and the benefits that were expected from them. Regarding the appropriations and present high taxes, he claimed that one-half

of the tax was returned directly to the people through the primary school fund.

Dr. Edwards of the College then gave an address upon "The Purpose of the Agricultural College." He explained the ideas of the founders of the Agricultural Colleges of the country, and the manner in which the ideas are being carried out in our own College. The character of the instruction and the benefits that young men would receive were touched upon. Contrary to the general impression that the College educates young men away from the farm, he showed that while only 11 per cent upon entering expect to follow agricultural pursuits, over 35 per cent of the graduates are actually engaged in farming, besides a large number who are teachers in this or other agricultural colleges, or are engaged in mechanical engineering lines.

W. L. Rossman (M. A. C. '89) Chemist of the Dairy and Food Commission, read a paper upon "Food Adulteration," showing the extent to which it is practiced, the adulterants used, and the improvement that has been found since the work of the commission began.

The first day of the session was devoted to horticulture and brought out a large local attendance of fruit growers. The speakers of this and following days were either from the College, or were farmers and horticulturists who had been selected by the superintendent of institutes, on account of their success along special lines, to attend the various county institutes.

The first speaker was Roland Morrill of Benton Harbor, President of the State Horticultural Society, upon the "Cultivation and Care of Peaches." He briefly outlined the methods by which he has grown large crops of fruit that have sold for the highest prices. He advised the selection of sandy loam or light clay loam soil, upon a slope where the air drainage is good; the use of trees of known purity and health, budded from bearing trees of varieties that have been tested in the locality. He planted 20 by 20 feet, and grew some crop the first year; after that the land was given up to the trees, and after a shallow plowing in the spring received a cultivation once or twice a week up to the middle of August. He practiced heading back the new growth one-half, and the thinning of the fruits so that they would stand eight inches apart. The use of a liberal amount of wood ashes and ground bone was advocated.

Hon. R. D. Graham of Grand Rapids, spoke upon "Marketing Peaches," giving the methods that are used at that point and urging that steps be taken to extend the market in order that the crop may be properly handled when the young trees come into bearing.

"Peaches in the Interior of Michigan" was handled by H. P. Gladden of the College, who explained the care necessary to secure good crops. He claimed that they were nearly as profitable in suitable locations as in the "Peach Belt," since they could be sold, without expense for transportation and commissions, in local markets at prices that would average as high as could be obtained in the large cities.

Prof. W. B. Barrows was to have spoken upon "Bees and Horticulture," but was kept at home by sickness, and the subject was discussed by J. A. Pearce of Grand Rapids, who urged their importance in fertilizing the flowers of our fruits.

The best methods of handling "Currants and Gooseberries" were explained by J. N. Stearns of Kalamazoo, while R. M. Kellogg of Ionia spoke upon "Successful Strawberry Culture." Both gentlemen urged the importance of a suitable soil, thorough preparation of the land, an abundance of plant food and frequent cultivation.

Prof. Taft upon "The Value of Spraying in Horticultural Economy" placed particular stress upon the necessity of understanding the nature of the insect or disease to be treated, and the proper remedy. For success it was also necessary to spray early and to do it thoroughly.

In the evening H. W. Mumford of the College, explained the benefits of the Farm Home Reading Circle; Thos. Gunson of the College read a paper upon "Forcing Vegetables under Glass," in which he referred to the growing demand for lettuce, radishes, mushrooms, asparagus and rhubarb, and the promising opening for business; while Hon. F. W. Redfern of Maple Rapids, made a "Plea for Unity of Action Among Farmers," urging organization, and in particular that they stand by the Dairy and Food Commissioner and the Tax Statistician.

(Concluded next week.)

Mechanical Section.

The series of institutes inaugurated this winter for the benefit of mechanics and engineers of the state, closed with two evening sessions at Grand Rapids, Wednesday and Thursday, Feb. 12 and 13. The preliminary advertising had been well attended to by Secretary Ward of the Young Men's Christian Association. We are also indebted to the Association for the use of its hall.

Several days previous to the opening of the institute, an exhibit of work of students in the M. A. C. shops was prepared and placed in a conspicuous place in the Y. M. C. A. building, which did much towards attracting attention to and exciting interest in the institute.

The department of Mechanical Engineering was represented by four men, Professors Weil and Chamberlain, and Instructors Newell and Westcott.

The first evening there was an attendance of over one hundred and twenty mechanics. Mr. Fox, of the Fox Machine Works, opened the institute with a short talk. The speaker commended the idea of institutes of this kind as encouraging the mechanic to study and think for himself. The difference between the high priced mechanic who always has employment, and the low priced man who can scarcely hold a position, consists largely in this, that the one uses his brains as well as hands and studies how to improve and increase his usefulness, while the other does not.

Following Mr. Fox, Prof. Weil addressed the audience, briefly outlining the purpose of the institute, also describing the nature and purposes of the course in Mechanical Engineering at M. A. C.

Following Professor Weil, Mr. Westcott spoke on the subject of "The Materials of Engineering Construction." The character of the work done in testing materials at the College was dwelt upon, and points of special importance were brought out and emphasized.

Prof. Chamberlain next took the floor and gave a very interesting talk on the subject of Machine Design. The difference between the crude, "rule of thumb" methods largely in vogue, and scientific designing of machinery was brought out.

A discussion of the course of work in the M. A. C. shops by Mr. Newell, was next on the program. Mr. Newell's talk describing the nature and extent of the work and the number of hours devoted to it, was specially appropriate in view of the specimen shop work on exhibition.

Prof. Weil closed the evening's program with a talk on Steam Engineering. Some fundamental facts and ideas were given as to the nature of heat, the efficiency of the steam engine, cylinder condensation, and the real object of increasing the steam pressure, and compounding.

The second meeting, Thursday evening, was well attended, about 100 being present, and the program was similar to that of the first night but the work was of a more advanced nature and was listened to with marked attention.

Mr. Westcott spoke again on the subject of Materials of construction. The practical application of knowledge gained was illustrated in the design of a riveted joint.

The subject of Machine Design was further exemplified by Prof. Chamberlain in the design of a steam engine crosshead. Diagrams were used, and the methods pursued in the designing room were shown.

Following Prof. Chamberlain, Prof. Weil spoke, his subject being Steam Engineering. Indicator diagrams were presented, showing defective valve setting, and the use of the indicator for the purpose of measuring the power of an engine. Prof. Weil related a number of personal experiences in connection with boiler and engine trials.

Mr. Newell closed the program with a talk on the subject, Shop Kinks. Screws, and screw cutting, methods of calculating the proper change gears for cutting any thread, were described.

After the close of this meeting, the scheme of starting a Mechanic's Club was talked over. As a result of Prof. Weil's efforts, about thirty men gave in their names, and expressed a willingness to take part in the movement.

Besides the work of the two evenings, outlined above, a large number of shops were visited, and shopmen interviewed. On the whole, the institute was a decided success. The attendance was good, and the interest shown was marked.

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PUBLISHED WEEKLY BY THE

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To be entered as second class matter at Lansing, Mich.

At a recent faculty meeting it was resolved to recommend to the Board of Agriculture that the next alumni catalog contain the war records of all graduates of the college who participated in the war for the preservation of the union.

The number of such students is of course small, but their record is a glorious one. Some of these men left college to respond to the call to arms and were graduated without having fully completed their course. Others returned at the close of the war and took up college work again. Still others did not enter college until after the close of the hostilities.

I remember well when a freshman copying the records of some of these men for Dr. Abbot. Of Dickey, who fell at Gettysburg, it was written that he was found "foremost among the slain in front of a redoubt that had been stormed." But the whole of heroism is not told by a record of gallantry in action. There came to some of these boys many weeks of illness in the hospital or months of starvation in southern prisons, more trying than facing death on the battle field. A good many of the students who went into the army never returned to take up work at this college. Some of these have achieved distinguished positions.

There has been no attempt at a lasting public recognition by the college of the war records of its students. Other colleges whose sons went out to do battle for their country have done something toward perpetuating their memories, a memorial hall, a tablet on the wall of the chapel, or a monument on the campus. Something to say to students as they go about their daily pursuits "These men, your brothers, went out in the days of darkness and trouble to give themselves for the common good. Your line of duty leads not to the battle field, but in the path of peace there is honor and reward for the one who leads an earnest and upright life."

It is hardly likely that this college will ever erect a building suitable for a memorial hall. The State, of course, would not do it, and private individuals do not seem inclined to make bequests of such importance to this school. So this form of monument is out of the question.

Should a good building ever be erected in which was a chapel or assembly room worthy to receive a memorial of such a nature, a bronze tablet upon the wall reciting the names and services of our soldiers would be an appropriate form of memorial. Or a monument with an appropriate group of sculpture placed in some suitable position on the campus, say on the quadrangle between Williams Hall, College Hall and the Library, would be well.

This matter would be a good thing for the Alumni Association to consider in the near future. Such a memorial, let it take whatever form it may, would come more appropriately from the alumni than from any other source.

We need not go outside of our own body to find a sculptor to execute a commission of this kind. The college has a graduate who as a sculptor has received recognition abroad and is a fit man to work into enduring bronze a monument to the memory of our soldiers. I refer to B. K. Canfield, '89.

Something should be done in this matter without much delay.

CLASS ANNOUNCEMENTS.

Agriculture for Freshmen, Prof. Mumford. Meet at Agricultural lecture room at 9 a. m., Tuesday. Bring note books.

Agricultural Chemistry, for Juniors, Dr. Kedzie. Meet in Chemical Lecture Room, 8 a. m. Tuesday.

Algebra, Second term for Agricultural Freshmen, Instructor Pashby. Meet on third floor of College Hall; Sec. B at 8 a. m.; Sec. A at 11 a. m. The class will continue with Van Velzer and Slichter's School Algebra, and every member of the class should procure a copy of Jones' Logarithmic Tables. No lesson for first meeting.

Advanced Algebra, for Mechanical Freshmen, Prof. Babcock. Text, Van Velzer and Slichter's University Algebra. Class room, second floor, south side, College Hall. First meeting of class at 8 a. m. Tuesday, for which a lesson will be assigned by announcement on College Hall bulletin board.

Examinations in Mathematics, 9 a. m. Tuesday, Entrance Arithmetic and Plane and Solid Geometry; 2 p. m. Tuesday, Algebra.

American Literature, will probably be transferred to last half of term.

Analytic Geometry, for Mechanical Sophomores, Professor Babcock. Text-book, Wentworth's Analytic Geometry. Class room on second floor of College Hall, south side. Class will meet daily at 10 a. m. First meeting Tuesday morning, for which prepare on pp. 1-4 of text-book.

Botany, for Sophomores, Dr. Beal. Text, Bessey's Botany for High Schools and Colleges. The class will meet in the Botanical Laboratory on Tuesday at 4 p. m.

Civil Engineering, elective for Agricultural Seniors, Professor Vedder. Johnson's Surveying should be obtained by each member of the class, but instruction will be largely by lectures. Class will meet in Engineering class room in College Hall. The time of meeting cannot be announced until elections are made on Monday evening. Provide note book for first meeting.

Drawing, Prof. Holdsworth. Students will come according to catalog, all meeting in the class room, third floor, north end, College Hall.

Mechanicals have Mondays, Wednesdays and Fridays. The material for first day is a tablet of free-hand drawing paper and any pencil you happen to have. The instructor will discuss material with the class.

Electrical Engineering, elective for Mechanical Seniors, Prof. Woodworth. Text, Slinger & Brookers Electrical Engineering ('95 edition). Meet at Physical Laboratory at 9 a. m. Come prepared to take notes and make calculations. Only those who have passed differential calculus are eligible to this class. Laboratory work four hours per week at time to be arranged.

Elementary General Chemistry, for Agr'l and Mech'l Sophomores, Prof. F. S. Kedzie, lectures in Chemical Lecture Room at 11 a. m. No text-book required at first. Bring note books. All who expect to pursue chemistry this year should begin with this course.

Ethics, 1st half term, for Agricultural Juniors. Prof. Hedrick. Meet at 11 a. m., Tuesday in class room A.

French, Time to be arranged later. Text-book same as last term.

German, Dr. Edwards. Meet according to catalog in classroom A. Text-book same as last term for first week.

Horticulture, for Agricultural Juniors, Prof. Taft, lectures. Meet at the class room in the Horticultural Laboratory at 9 a. m., with note books; and at the same place at 1 p. m. for laboratory work. Arrangements will be made for a class in Senior Horticulture, the hour to be announced later.

Hydraulics, elective for Mechanical Seniors, Professor Vedder. Text, The Mechanics of Fluids in Church's Mechanics. Engineering class room, College Hall. 9 a. m., first meeting Tuesday morning. No preparation required for first session of class.

Mechanics of Engineering, Mechanical Juniors, Professor Vedder. Text, Church's Mechanics. First session of class Tuesday morning, for which the lesson will be pp. 1-7 inclusive of the text-book. The class will meet in Engineering class room, College Hall, daily at 8 a. m., unless this hour should be changed to accommodate a rearrangement of other studies in the mechanical course, in which case announcement will be posted on the bulletin boards.

Mechanical Department.

SENIORS. Tuesday, Feb. 25, 8 a. m., Kinematics. Text-book, Stahl & Wood's Elements of Mechanism. 10 a. m., Advanced Machine Design. Text-book, Low-Bewis' Manual of Machine Drawing and Design. 1 p. m., Steam Engineering Laboratory.

JUNIORS. Days and hour for Advanced Machine Design will be announced at the chapel Monday evening, Feb. 24. For day and hour for Boilers, see bulletin board at Mechanical Laboratory; students in this subject must procure A Treatise on Steam Boilers, by Wilson-Flather. Class will meet in Machine Shop on Tuesday, Feb. 25, at 1 p. m.

SOPHOMORES. 1 p. m., Wednesday, Feb. 26. Drawing. Text-book, Klein's Machine Design. Class will meet in Machine Shop, Friday, Feb. 28, at 1 p. m.

FRESHMEN. Class will meet in Wof Shop, Tuesday Feb. 25, at 10 a. m.

Physics, for Agricultural and Mechanical Freshmen, Prof. Woodworth. Text, Atkinson's Ganot. Meet in Physical Laboratory at 4 p. m. on Tuesday, Wednesday and Thursday of this week. Laboratory practice two hours per week for Mechanical Freshmen, at time to be arranged.

Plane Geometry, for Mechanical Freshmen. Profs. Babcock and Pashby. The class will meet on second floor, south side of College Hall, Tuesday morning at 9 a. m. for registration and division into sections. Bring Beman and Smith's Geometry. No lesson assigned.

Political Economy, elective for Seniors, Prof. Hedrick. Text, Walker's Political Economy. Time to be arranged.

Rhetoric, for Sophomores, Prof. Noble. Text Genung's Practical Elements of Rhetoric. Meet in English class room at hours announced in catalog; agricultural students at 8 a. m. and mechanical at 9 a. m. Lesson for Tuesday pages 193 to 198 on "The Paragraph." Only those who have passed freshman rhetoric will be eligible to this class.

For the benefit of students wishing to take this course who have not yet passed freshman rhetoric, an examination in the latter subject will be given Tuesday afternoon. All such students should consult Prof. Noble by Tuesday noon, at the latest, to arrange an hour for the examination.

Rhetoricals, for Sophomores, D. J. Crosby. Burke's Speech on Conciliation with America. Meet at hours given in the catalog. Mechanicals on Wednesdays and Agricultural on Tuesdays.

Rhetoricals, for Mechanical Freshmen, D. J. Crosby. Hamill's New Science of Elocution. A division will meet at 3 p. m., Wednesday, and B. division at 3 p. m., Thursday. Examinations for advanced standing in both Sophomore and Freshman work in Rhetoricals will be given on Tuesday afternoon to those who arrange for the same with the instructor by Tuesday noon.

Shakespeare, Read Hamlet. Meet in class room A. at 4 p. m. Thursdays.

Stock Feeding for Juniors, Prof. Smith. Meet in Agricultural lecture room at 11 a. m., Tuesday. Bring note books. Provision will be made later for assignment of student labor.

RECEPTION TO PRESIDENT SNYDER.

Last Friday evening fully one hundred people gathered in the library to welcome our new president, Dr. Snyder. The guests as they arrived were received in the reading room by Hon. C. J. Monroe, Dr. Snyder, Prof. and Mrs. Barrows, Prof. and Mrs. Holdsworth, Prof. and Mrs. Weil, and Secy. Butterfield.

After the company had arrived and shaken hands all around they repaired to the library and partook of light refreshments, while from the galleries above came the music of mandolin and guitar furnished by Messrs. Partridge and Eastman.

The remainder of the evening was spent in making the acquaintance of our new executive and in renewing old acquaintances. Quite a number of students who had just returned from the long vacation were present—all glad to get back. Among the visitors present were Mr. and Mrs. C. A. Gower and Mr. and Mrs. Elgin Mifflin of Lansing; Mr. F. H. Stone of Hillsdale; Mr. R. M. Bates, '85, of Hastings, and Mr. L. C. Brooks, '92, m., of Stronach.

Dr. Snyder leaves at once for Pittsburg to get his work in shape for moving here the first of April.

"THE SPRAYING OF PLANTS."

REVIEWED BY PROF. L. R. TAFT.

E. G. Lodeman, '89, Instructor in Horticulture at Cornell University, has just issued a work entitled "The Spraying of Plants." It was written as a thesis for the degree of Master of Science.

It gives the early history of liquid applications in this country and Europe, with particular attention to the introduction of the copper salts and Bordeaux mixture. The use of Paris green and other arsenites is also traced.

Considerable space is devoted to the materials and formulas used in spraying and to spraying devices and machinery. One chapter treats of the action of spraying mixtures upon insects and fungi, upon the host plant, upon the soil and upon the value of the crop. The more troublesome insects and diseases of a great variety of our cultivated plants are described and illustrated and specific directions for treating them are given.

It is the most complete treatise upon the subject ever

published in the country, and with the large experience of the author, the recommendations, which are well up to date, cannot fail to be of value to every fruit grower.

COPPER PANS FOR BOILING SAP.

Ithaca, Mich., Feb. 10, 1896.

I am thinking of using copper pans for making maple syrup. Are copper pans all right for this purpose? Some think copper would color the maple syrup. Your answer would be greatly appreciated. W.

Copper pans are better than those made of sheet iron or galvanized iron, because copper is a better conductor of heat than iron, and evaporation will take place more rapidly in copper pans. If the copper is kept clean and free from oxide it will not color the syrup.

DR. R. C. KEDZIE.

AT THE COLLEGE.

Born to Prof. and Mrs. Noble, Saturday, February 22, a daughter.

The Bachelors now think they have the nicest dining-room and the nicest club on the grounds.

Chace Newman, clerk for the Mechanical Department, spent Sunday, Feb. 15, at his home in Portland.

Miss Clara Steele who was obliged to give up school work last fall on account of sickness will again enter school today.

Mrs. C. S. Brooks has been visiting at her former home in Saginaw for a couple of weeks. Her mother will return with her.

The new dynamo in the Mechanical Laboratory is giving excellent satisfaction. When the shops are all lighted up at night the effect is very brilliant.

The M. A. C. Board of Visitors, Messrs. C. A. Gower, Lansing; F. H. Stone, Hillsdale, and R. M. Bates, Hastings, were at the College last Thursday and Friday.

The Eclectic society rooms are undergoing extensive repairs. A new hard wood floor will be laid in the auditorium and the whole suite of rooms will be fitted with oak casings and moldings, and be repapered.

L. C. Brooks, '92, *m.*, had the misfortune to lose his schoolhouse by fire last Wednesday. He is at present visiting his father, and does not know what provision will be made for the remainder of the school year.

Since the arrival of the cold wave the ice house has been filled with a very good quality of ice. On Wednesday, the coldest day of the winter, Thomas Durkin tried the temperature of the water by stepping in waist deep and found it a little cool.

Monday morning, Feb. 17, the thermometer at the south end of the Chemical Laboratory, which can not go lower than 20° below zero, was found with its red lemonade filling all drawn into the bulb, while over at Howard Terrace the thermometer registered 22° below.

A wedding a week—some weeks. Last Wednesday M. W. Fulton, Instructor in Agriculture, was married to Miss Annie Tucker at the residence of Mr. and Mrs. William Tucker, parents of the bride, Highland Park, Mich. Only near relatives of the bride and groom were present. Mr. and Mrs. Fulton will reside at Prof. Smith's for a short time and then occupy the Herdman's house.

Not everyone is aware that we have at the College a society of King's Daughters. The membership of the society, of which Mrs. Gunson is president and Mrs. Weil secretary, includes ten of the College ladies who meet once in two weeks for the purpose of doing what they can for the advancement of any Christian work that they may find to do. The next meeting will be held at Mrs. Weil's March 3.

Mr. Magnus Nelson, an extensive fruit grower and dairyman from Menominee in the Upper Peninsula, visited the College Saturday, Feb. 15. He remarked that he owed his orchard entirely to the good advice given him by the Station bulletin on the matter of spraying. His trees were on the verge of destruction by the oyster shell bark louse, when he sprayed with kerosene emulsion and saved them.

The last of January, Mr. W. A. Brotherton of Rochester, Mich., sent to the Botanical Department for identification a bundle of Western weeds, twenty-seven in number, taken by him from baled hay sold in that village said to have been grown in Arizona. Several of these weeds are being introduced into Michigan by means of Western grown seeds, and now we have the proof that the most dangerous means is in the baled hay received from the West. Among the weeds sent by Mr. Brotherton are the following, viz: Buffalo bur,

tumble weed, barn-yard grass, switch grass, old witch grass, two Boutelouas, and a ragweed new to the State. The character of the weeds shows that the hay could not have grown so far west as Arizona but in all probability was sent from Indian territory or Missouri. The seeds of all these weeds will be planted in the spring to test their germinative qualities.

The Department of Physics and Electrical Engineering has just received a fine piece of electrical apparatus ordered last year. It is a Wattmeter capable of being used in a variety of ranges. It is either for direct or alternating current work, has a range of from 0 to 50 amperes and three voltage ranges, 0-75, 0-150, and 0-750 volts. The maximum range is about 50 horse power. The instrument will be used as a check on other instruments, to calibrate commercial Wattmete and for street car motor testing.

PROCEEDINGS OF THE BOARD.

February 20.

The Farm Department was authorized to set out a row of pines along the entire west side of the farm for a wind break, and to plant to white pine the two and one-half acres on the east side of highway and south of the river.

Secretary Butterfield, Dr. Beal and Prof. Vedder were elected delegates to the Good Roads Convention, March 3.

Mr. Garfield was elected delegate to the National Organization of Institute Workers at Watertown, Wis.

The recommendation of the Special Faculty Committee regarding the publication of the RECORD, viz., that the President of the College be ex-officio chairman of the Committee on Publication; that the students be invited to cooperate in the publication of the RECORD, according to a plan subsequently to be formulated; and that Prof. F. S. Kedzie, Prof. C. L. Weil and Prof. L. R. Taft be the committee on publication from the Faculty, was adopted.

Lieut. Lewis was authorized to continue during the spring term at his discretion a course in physical culture for the students, provided that no extra expense be incurred for instruction.

Of the report of the Special Faculty Committee the following recommendations were adopted:

That short special courses be provided as soon as practicable;

That something be done to get in touch with the district schools;

That a short preparatory course be provided;

That a course for ladies be provided as soon as the finances of the College will allow;

That the experiment be tried of organizing a boarding hall under private management, with a single requirement that the board be not over two dollars per week, and with board in said hall entirely a matter of choice on the part of students, the details being left to the Special Committee and the Secretary.

That a committee of the Faculty, of which the President shall be chairman, shall consider and recommend some method of handling text-books.

That an earnest, united, and persistent effort be made to discourage expensive entertainments at the College, and to encourage plain, simple, and inexpensive social and individual life.

And that the President and Secretary of the College and Dr. Edwards be a committee to consider the matter of advertising, and make a special report to the Board.

NEWS FROM GRADUATES AND STUDENTS.

Students in Mechanical Course designated by "*m.*" and specials by "*sp.*" after name.

Frank T. Beaver, *m.*, with '94, is city editor of the Niles Daily Star.

Guy L. Stewart, '95, is doing editorial and local work for one of the Gaylord papers.

Clark Hubbell, '88, is now located at Rathdrum, Idaho, and is still practicing law.

C. R. Tock, with '96, writes from 525 River St., Hoboken, N. J., for his chemistry note book.

Chas. W. McKenny, '81, is professor of history and principal of the normal department at Olivet.

H. A. Martin, '89, Lawrence, Mich., will send a girl and two boys to his alma mater in a few years.

Edward Monroe is the name of the son born to Mr. and Mrs. Geo. A. Hawley, '92, *m.*, Hart, Michigan.

E. W. Redman, '87, has been compelled to go west on account of his wife's health. He is located at Pasadena.

L. B. Hall, '82, for the past several years superintendent of schools at Belding, Mich., is at present in the insurance and real estate business at Ionia, Mich. Last

summer he showed the farmers of his township how to successfully raise potatoes at a profit.

Geo. J. Jenks, '89, is secretary of the recently organized Harbor Beach Resort Association with headquarters at Sand Beach.

G. F. Bristol, with '90, is assistant engineer in the office of D. L. & N. and C. & W. M. R. R. Headquarters at Grand Rapids.

Homer Skeels, *sp.*, '97, of Grand Rapids, is chairman of the standing sub-committee on botany of the Kent Scientific Institute for the ensuing year.

E. C. Peters, '93, of the firm, Seeman & Peters, Saginaw, E. S., reports business on the boom. Ten hours a day and half the night for the past few weeks.

Much credit is due Mr. Campbell, '94, for the spirit and enthusiasm which pervaded the meeting.—From the Saranac Advertiser on the Teachers' Institute of Feb. 8.

The Cannonsburg, Kent Co., school, in charge of F. P. Normington, '95, was closed February 11, on account of an outbreak of diphtheria. Four cases so far with no deaths.

A fifty acre farm just out of Grand Rapids occupies the attention of Ben C. Porter, '84. He pays particular attention to dairying and does all the work of the farm himself.

Tom Squier, '97, *m.*, since October 1, has been attending the Parrish Business College at Grand Rapids. Having finished the bookkeeping course he will take up stenography next.

Dwight S. Cole, '93, *m.*, has left Detroit and is now located with the Fox Machine Co. as designer and machinist in the tool department. His address is 212 Ottawa St., Grand Rapids.

Harry A. Haak, with '93 *m.*, Luther, Mich., is a member of the firm of Haak Bros., hardwood lumbermen, chair makers and Holstein cattle breeders. Harry A. has charge of the machinery in the chair department.

T. F. McGrath, '89, is engaged with the civil engineering department of the Northwestern Elevated Railway Company and expects to continue in that capacity for some time. His address is 34 Pearce St., Chicago.

W. W. Smith, with '95, *m.*, who left in '94 to take special work at Purdue, is now an assistant draughtsman and civil engineer for the Standard Oil Refining Company at Whitney, Ind. This plant is the largest in the world.

W. L. Cumings, '93, has for the past seven months held a position of inspector on the Yazoo-Mississippi Delta Levee Board. Since residing in that State he has spent one month in the hospital where he underwent extensive repairs.

F. W. Hastings, '78, is a railway postal clerk with a route between Frankfort, Mich. and Toledo, Ohio. He also operates a farm at his home in St. Louis, giving special attention to the breeding of Poland China swine in which he is quite successful.

Prof. A. J. Cook, '62, of Pomona College, California, has his hands full. Besides his college duties he has charge of institutes for lower California and has been requested to take charge of the work over the whole state. He has organized sixteen farmers' clubs and every one is vigorous and growing. Then as if this were not enough he also superintends the Chautauqua summer school for California.

From a Kalamazoo paper we clip the following regarding one of our '94 men: The schools are in the best of condition. There are 230 pupils enrolled at present. Five teachers are employed. Mr. C. B. Smith is a self made man, and as superintendent, will make Lawton schools one of the best in the state. Since the beginning of his first year last September, he has added revised courses in German, French, botany, chemistry. He has also formed a bookkeeping class of about fifteen. A small laboratory is in the course of construction. C. B. Smith, superintendent of the schools, was born in Howardsville, St. Joseph county, Mich., September 21, 1870. At the age of 12 his parents moved to Montmorency county, where he attended school in a log school house. It was at this time he earned money to pay his schooling at Port Huron. He afterward worked at bookkeeping at Alpena, scaling logs and doing other work in the woods, but his thirst for knowledge was stronger, so he entered the Agricultural College at Lansing, until money ran short. The next we hear of him he was at Gaylord, as superintendent of the schools. He then went back to Lansing, remaining in the college, where he graduated with the class of 1894. He remained one year longer as post graduate obtaining the degree of Master of Science. Although young in years, Mr. Smith is old in experience, and Lawton should put forth every effort to retain Mr. Smith for years.

GLEANINGS FROM INSTITUTES.

C. M. Pierce of Elva, Mich., who took a prominent part in the Tuscola County Institute, thinks farmers do not hold together enough in their organizations, "are too fickle minded, go off on too many tangents to make a success when they come in competition with other classes. I have come to the conclusion that the only thing that will ever take them out of these ruts is an education equal to or *better than other classes have.*"

And this is what one of Tuscola county's farm daughters thinks about keeping the boys and girls on the farm: "As to the best means of keeping the boys and girls on the farm, I have only to judge by my past inclinations. I have a good home and all that a girl need have, but as far back as I can remember if I had an opportunity of earning something for myself there was more satisfaction in it than if I had had twice the amount given to me in ready money. Suppose a father says to his son: 'Johnny, there is that calf, I don't know as I will bother with it; if you want it and will take care of it you may have it.' How the little fellow's eyes will brighten and what care he will give it because it is his. Give him a puny, sickly lamb that is good for nothing in your estimation and he will make it worth something if it is possible, *because it is his.* In other words, let your children go in partnership with you. If you want to put an extra building on your farm and you can hardly afford it, discuss the subject with the whole family; do not leave out even the little fellow. Make it a mutual affair and thereby cause him to feel that he is a part owner in this bank stock, and I doubt if there will be any trouble in keeping the boy or girl on the farm."

Mr. L. E. Slussar, President of Mancelona village, in his address of welcome to the Farmer's Institute, says:

"I know of no more honorable calling than that of farmer. There are times, perhaps, when you have envied the merchant, or the lawyer, or the banker and wished yourself in a position to take life as easy as they. But did it ever occur to you that the merchant, and the lawyer, and the banker have all envied the life of the farmer and that throughout the country today will be found thousands of business and professional men spending their vacations and their holidays upon farms of their own—and there are thousands of others who would do so did they but possess the farm.

"It is true that the comic papers crack jokes at the expense of the tiller of the soil and take delight in picturing Uncle Silas or Uncle Reuben with an old fashioned carpet bag in one hand and a dilapidated umbrella and lunch box in the other, falling an easy victim to the wiles of the bunco-steerer on his first visit to the city. They take delight in ridiculing the farmer and belittling his calling, but the fact remains that there is no line of business today which requires as much brains to make it a success as the one you have chosen. A great many people have an idea that when a man has made a failure of everything else, he should, as a last resort, turn his attention to farming. To successfully grow beets and bagas and potatoes they imagine that all that is necessary is to first stir the ground a little with a plow and then to plant and cover the seed, and that the Almighty with the aid of a little sunshine and rainwater will do the rest; but, doubtless the most of you have discovered that sunshine and rainwater are not always to be depended upon, and that he who trusts everything to the power that opens wide or keeps hermetically sealed the flood-gates of heaven, is liable, quite liable, to meet with bitter disappointment.

"Farming, as it is carried on today, is a science, and no man can make it a success who fails to give it the careful thought and study and research which it requires. You all recognize this fact and that is why you are here today, and I believe that you will be benefited by coming, and will glean many valuable points from the able and distinguished gentlemen who are here to address you."

FARMING IN SCOTLAND.

Read at Ionia Co., Institute, Ionia, Jan. 23, '96, by Alfred R. Locke, '91, Belding.]

(Continued from last week.)

Turnips are depended upon as an article of food for cattle and sheep, and are raised extensively in all parts. They are sown in drills, cultivated, and thinned as they acquire size. A failure in this crop, which sometimes occurs from disease, is a great loss to the farmer. They take the place of grain and hay to a great extent, especially for milch cows, and they are carefully gathered and stored for winter use.

Flax is grown in the north and east of Scotland, but I had no observation of its cultivation.

Wheat is raised only incidentally, and then not for

profit, but to preserve a rotation in crops, and to secure advantageous ground for grass seeding.

Cabbages, cauliflowers and similar vegetables grow luxuriantly, and are grown at considerable profits to the gardner. The methods of cultivation do not differ from our own.

Fruits are limited and the people depend almost entirely upon importation from south England, France, Spain, and the Americas for their supply. Gooseberries however grow luxuriantly, and I can recommend to you the Scotch gooseberry tart.

Owing to the mild, moist climate, hay and pasture land is abundant, and in many winters the grass remains green and affords pasture during the whole winter. Rye grass is the principal variety. Clover does not seem to do as well there as here; why, I do not know. In harvesting the crop of hay it is stacked in the field in small stacks, having about a load of hay in each stack, and in the fall of the year these are gathered in and stored in large stacks by the barns and covered with coarse straw or canvas.

In general the Scotch system of agriculture is what is known as the intensive system. Their soil is kept under a high state of cultivation. It is kept well fertilized, and large crops are raised from small areas of ground. This is necessarily so in any country having a dense population.

But their methods of agriculture are rude in many instances, as compared with ours. They depend greatly upon hand labor. Instead of wagons for the handling of produce, they use carts drawn by one horse, and while in many instances they are convenient, yet when one sees both cart and horse nearly concealed by a load of hay or grain, the advantages of our wagons are conspicuous. Their field plows are small, turning a narrow furrow, and the soil is turned only to the depth of four or five inches. This on many farms is necessary as the rock comes within a few inches of the surface. Very few use improved harrows and cultivators, and fewer still harvesters and binders.

Field work is done by both women and men, and it is a very common sight to see women taking up their beat after the sickle or the reaper, or using the hoe and the harrow in tilling the soil. It is also the duty of the housewife and the girls of the family to look after the cows and attend to the milking.

In all the departments of farm work we find neatness and dispatch. The housewife is neat, and although her duties are divided between farm, stables, and the house, there is no negligence in her work. Her butter is the finest, her cheese is the best of any produced. She excels the Danish housewife, as does the Danish the Irish. Scotch butter sells in the market at from four to six cents per pound more than any other make. The pains that are taken in the manufacture of cheeses also brings for them an extra margin in price over foreign made.

There is in Great Britain no tariff system designed to protect the Scotch farmer from competition with the farmers of other nations, his markets are open to the world. British merchantmen bring to his very door the surplus products of all nations, and he must sell at their prices, except as the excellence of his produce brings him a money margin.

So the Scotch farmer has his adversities as well as the American. There is his landlord's factor pressing him for rent, and his lease with its law binding terms, from which he cannot depart, a moist climate which is liable to be excessively moist, competition with four continents flooding his market with cheap butter and cheese from Canada, the United States, Australia, Ireland, and Denmark, beef and pork from the Americas which can be sold in his market for less than the cost of raising on his farm.

Yet the Scotch farmer is well contented. He is a steady, sturdy, plodding, honest person. He loves his home his country, and his church. He is faithful and loyal. He has made of Great Britain what she is as much as any Englishman. His politics are honest; he starts not at the sound of the demagogue's cry for political reform, tariff changes, or free silver, to form a stampede and to rush into that which he knows not.

But he is conservative in his politics as he is in his methods of farming and his religion. He believes in the stability of customs and business, that tinkering in the administration of the laws of trade and commerce will cause only stagnation and uncertainty. He does not expect to make a fortune from his own labor, but merely a good living; nor does he expect to become suddenly prosperous or rich by forcing upon the government some fanatical money scheme, but he does expect constancy in the laws of trade and in the policy of the government, and then by steady, hard and honest effort he rears his family and provides his home and fears not the competition of the world.

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