The M. A. C. RECORD.

MICHIGAN STATE AGRICULTURAL COLLEGE.

VOL. 10. LANSING, MICHIGAN, TUESDAY, JUNE 20, 1905. No. 39

UNION LIT. COMMENCEMENT FESTIVAL.

On Monday, the 19th, the Union Literary Society celebrated its 25th annual commencement. The society rooms were very prettily decorated with ferns and potted plants which with the predominating white gowns formed a pretty effect. After a short reception the following program was rendered at the society building:

President's Address, Mr. Ford.

Poem, Mr. Salisbury.

Oration, "The Watchful Citizen," Mr. Lambert.

College Paper, Mr. Stringer.

Prophesy, Mr. Glazier.

After this interesting program we adjourned to the dining hall of the Women's Building where a dainty five-course banquet was served.

After the banquet Toastmaster A. J. Anderson took the floor and after a few well chosen remarks opened this part of the program by introducing Mr. Ranney, who toasted, "Bye-gone Days." The next speaker was Mr. J. P. Haftenkamp, who responded to "The Future;" he was followed by Mr. R. G. Potts with "Our Seniors." The last toast on the program was "Our Society," by Mr. A. D. Peters, and after Mr. Anderson's closing remarks, all arose and gave the old U. L. S. yell.

We then adjourned to the building where the remainder of the day and no small fraction of the next was spent in dancing. Prof. and Mrs. Babcock and Prof. and Mrs. W. O. Hedrick kindly acted as patrons for the evening. A number of alumni members were present, those from out of town were Mr. and Mrs. W. K. Prudden, '78, of Lansing, Mr. and Mrs. Ranney, '00, of Greenville and Mr. Lyman Carrier, '02.

Y. M. C. A.

During the past year the membership of the Y. M. C. A. has reached the number of 244. Of this 133 are active and 111 associate members.

In the Bible study department there have been 10 classes with a total enrollment of 204. Classes have been held in "The Life of Christ," "Studies in the Acts and Epistles," "Old Testament Characters," "History of the Bible," and "Christian Evidences."

One class in "Studies for Personal Workers" was held during the first two terms, taking up the study of "Christian Evidences" the last ten weeks.

There have been 54 men in the different mission study classes. The texts used were, "Effective Workers in Needy Fields," "Japan and Its Regeneration," and "The New Era in the Philippines."

The association meetings have been well attended, an average of 60 men being present in the Thursday evening services. The average attendance in the Sunday evening union meetings has been 180.

We will be represented at the Lakeside summer conference by seven men and at Lake Geneva by two more.

A NEW DISPLAY BOARD.

A new board for the purpose of displaying the samples of work done by four and five-year men during the year in the wood shop has been placed in the wood working room. The board is 2 ft. 6 in. by 8 ft. and is stained black, which furnishes a splendid background upon which are fastened the samples. The center piece consists of a highly polished and varnished sample of bird's eye maple, about 12x16 inches in size, set in a neat cherry frame. The words "MECHANICAL DEPARTMENT," a beautiful monogram of the letters "M. A. C.," and the years "'08" and "'09" are inlaid into this in black walnut, the inlaying being done by Messrs. Martin and Musselman, '08, and Bleach and Davis, '09. Around this center-piece are placed samples of all joint exercises made in hard wood (black walnut and maple) which gives a finished appearance to the work. The several pattern exercises are shown as are also a few special exercises. The collection also includes lathe samples and a few of the samples of fancy inlay work, including a vase and gavel made of the two hard woods.

The work has been changed somewhat from that formerly given in that it is aimed to make it more practical, a less amount of the fancy work being required in class.

This display is the result of careful, painstaking work on the part of the students and reflects great credit upon the instructor in charge. We are sure it will be admired by many M. A. C. visitors during the summer.

Professor Andrew J. Patten, lately appointed chemist of the experiment station to succeed Professor Floyd W. Robinson, who has become chemist of the state dairy and food department, has been assistant chemist at the Geneva station for five years, where he was associated with H. J. Eustace and Frank Hall, graduates of this college.

Professor Patten is a graduate of the University of Maine at Orono. After graduation he was assistant in the chemical laboratory under C. D. Woods. He then spent a year at the University of Heidelberg in Germany, where he had the benefit of the tuition of the renowned Kossel. He has made a study of the problems surrounding the nutrition of animals, and comes to us fully prepared to undertake the solution of the very important and pressing questions which confront the Michigan farmers.

He has secured rooms at the residence of Dr. Landon on the Delta.

Mr. J. S. Shaw will remain as his assistant. Mr. E. A. Boyer is also assisting in the laboratory, temporarily.

ALUMNI.

'69.

James Satterlee will make his home in Lansing in the future. His home faces Capitol Square and is the residence formerly occupied by Frank Wells.

'69–70.

On Tuesday of commencement week all of the living members of the class of 1870, excepting George A. Farr, were on the campus. The members present were, Charles W. Garfield, of Grand Rapids, Roswell Lilie, Hammond, La., Ansel H. Phinney, Turner, H. G. Reynolds, Pasadena, Cal., W. W. Reynolds, Cassopolis, Charles D. Sprague, Wacousta, and Charles S. Williams, Owosso. Three members of the class of '69 were also at M. A. C. on the above day. They were, James Satterlee, now of Lansing, John Strange, Grand Ledge, and Henry E. Gibson, of Lansing. These men who graduated 35 or 36 years ago, assembled on Tuesday morning and spent the day on the campus, talking over old times. It is said that in one or two cases introductions were necessary, so great was the change which had taken place. On Tuesday afternoon they were grouped in front of Dr. Edwards' residence, where they were photographed. In the evening they gathered at the Hotel Downey for tea, after which all spent the evening at the home of Mr. Satterlee in the city.

Had it not been for the serious illness of his wife, Mr. Farr would also have been present on this occasion.

'70.

H. G. Reynolds, a former secretary of the College, who was here for commencement, has just returned from a two years trip through Europe with his daughters, and is now journeying through the United States with his two younger sons. He will spend the greater part of this month in Michigan, and will go from here to the Yellowstone Park.

'87.

W. C. Hall, of the firm of Gibson and Hall, called on College friends one day this week. Mr. Hall is interested in the sale of "Michigan Forest Products," and makes the handling of hard wood lumber a specialty. His office is at 422 Widdicomb Building.

'03.

F. M. Morrison, '03, writes interestingly of his year's work as director of manual training and drawing at Kittanning, Pa., and states that he has been re-elected for another year. He is spending the summer at his home in Detroit.

An unusually large number of the parents and friends of the graduating class were at the commencement exercises.

Invitations have been issued for the wedding of Miss Katherine F. Gunn and Mr. Richard L. Yates, Wednesday, June 28, at four o'clock p. m., at the home of the bride's mother in Collegeville.

'75–'78.

E. Cass. Harrington is principal attorney for the Colorado Fuel and Iron Co., of Denver. Mr. Harrington has met with splendid success in his work, and is a very prominent professional man in Denver. He was attorney for Gov. Peabody in his recent campaign for the governorship.

'76.

J. D. Stannard is engaged in irrigation engineering in Colorado and makes his home in Denver, Colo.

'94.

J. W. Rittenger, '94, was married on Wednesday, June 14, to Miss Anna McDuffee, at South Bend, Ind. Mr. Rittenger has been principal of Olive township high school, located at New Carlisle, Ind., for the past four years, but will have charge of the department of history in the South Bend high school next year. Mrs. Rittenger has had charge of Latin and English in the New Carlisle high school during the past four years. Mr. and Mrs. Rittenger were visiting the former's college friends a few days last week.

'96.

The following interesting information is furnished by Prof. R. L. Clute, '96, whom we mentioned as a teacher of agriculture in the Philippines: "Each pupil is given a plot 5–30 ft., plants one row of all common vegetables, cultivates and irrigates the same, and has all vegetables he can raise. We succeeded in raising from American seed, yellow dent corn, egg plant, onions, lettuce, beets, radishes, cabbage, okra, carrots, string beans, tomatoes. The cotton ball weevil destroyed all buds of cotton. In the laboratory we studied seed germination, plant food, fruits, soils, insects, drainage and irrigation. All the pupils of the second year took this work (105) and met daily throughout the entire year. The boys and girls were from 15 to 22 years of age. The most highly prized vegetable was the large purple egg plant. Large bamboo hats were used when the sun was too hot. Every month we had a union meeting and were addressed by members of the agricultural bureau or specialists in the government laboratories. At these meetings the culture of sugar, hemp, tobacco and rice were discussed. Dr. Barrows, chief of the educational bureau, is in favor of organizing an agricultural school. The boys and girls take great interest in the work, both in the class room and in the field." Mr. Clute spoke at the last Hort. Club meeting of the term, where many interesting features of his work in the island were explained.

'06–'07.

Mr. Channing Beal, with '06, and Miss Bertha Graham, with '07, were united in marriage Wednesday evening, June 14, at the home of the bride's parents, near Adrian, Mich.

THE M. A. C. RECORD.

PUBLISHED EVERY TUESDAY DURING THE COLLEGE YEAR BY THE MICHIGAN STATE AGRICULTURAL COLLEGE

B. A. FAUNCE, MANAGING EDITOR

ASSOCIATE EDITORS.

PAULINA RAVEN, '05.
EDITH HUTCHINS, '06.
CALLA KRENTEL, '07.
H. I. GLAZIER, '07.
G. C. DUDLEY, '07.
T. H. McHATTON, '07.
OIE STEPHENSON, '07.
B. B. CLISE, '07.
O. I. GREGG, '07
BERENICE MAYNARD, Sp.

Subscription, - - - 50 cents per year.

Remit by P. O. Money Order, Draft or Registered Letter. Do not send stamps.

Address all subscriptions and advertising matter to the College Secretary, Agricultural College, Mich. Address all contributions to the Managing Editor.

Business Office with Lawrence & Van Buren Printing Co., 122 Ottawa St. E., Lansing, Mich.

Entered as second-class mail matter, Lansing, Mich.

This paper is occasionally sent to non subscribers. Such persons need have no hesitation about taking the paper from the post-office, for no charge will be made for it. The only way, however, to secure the paper regularly is to subscribe.

TUESDAY, JUNE 20, 1905.

COMMENCEMENT.

The weather during commencement week was all that could be desired and the exercises passed off very smoothly and pleasantly. The baccalaureate sermon on June 18 was well attended and much appreciated. We publish the sermon in full elsewhere in this issue. A number of alumni and former students were back for the society reunions, all of which were thoroughly enjoyed. The reception given by President and Mrs. Snyder on Tuesday evening was attended by the seniors and their friends, members of the faculty and others. The decorations were very attractive, the music was good and a very pleasant evening was spent. The refreshments consisted of ice cream, cake and punch.

Commencement day was one of the most pleasant days of the term and the exercises were well attended. Following is the program rendered:

Music.
Invocation.
Overture to Tannhauser . . . . . *Wagner*
(2 pianos, 8 hands, arranged by Roques)
Miss Freyhofer Mr. Neal Perry
Miss Mack Miss Northrop
Address, The Forward Movement in Plant Breeding . . . . Victor R. Gardner
(*Agricultural Course*)
Address, The Development of Electric Traction . . . . . Horace S. Hunt
(*Mechanical Course*)
Address, History of Woman's Education in the United States . . Bon Bennett
(*Women's Course*)
Vocal Solo, When the Heart is Young, *Dudley Buck*
Miss Cornelia Porter
Address, The Panama Canal
Hon. Charles E. Townsend
Jackson, Mich.
Vocal Solo, When Celia Sings . *Frank Moir*
Miss Cornelia Porter
Conferring of Degrees

The piano selection "Overture to Tannhauser" was well rendered and received much favorable comment as did also the solos by Miss Porter. The addresses by the members of the graduating class were intensely practical and showed careful preparation on the part of each. The address by the Hon. Charles E. Townsend as orator of the day on "The Panama Canal" was very interesting coming from one who is so well acquainted with conditions as they actually exist in the region of the proposed canal.

The degree of Bachelor of Science was conferred on the following:

Adams, Ethel Mae, w, Armada.
Anderson, Arthur J., a, Shelby.
Auten, Clyde I., m, Clyde.
Baker, Helen Deborah, w, Agr'l College.
Bell, R. Floyd, m, Mason.
Bemis, Bessie E., w, Ionia.
Bennett, Bon C., w, Lansing.
Bennett, Franc C., w, Lansing.
Bennett, Wilmer C., m, Bad Axe.
Benton, Zoe, w, Washington, D. C.
Bolte, John Willard, a, Lakeside, Ill.
Bos, William M., a, Forest Grove.
Brown, Jessie, w, Grand Rapids.
Burk, Oliver W., m, Smith.
Burrell, Orange B., a, South Haven.
Bushnell, Leland D., a, Bronson.
Butterfield, Mary A., w, Detroit.
Campbell, Clara S., w, Lansing.
Carl, Roscoe J., a, Bath.
Coad, Kate M., w, Williamston.
Davis, Elva R., w, Ionia.
Dunks, Fred S., a, Union City.
Feldcamp, Cora L., w, Ann Arbor.
Ferguson, Robert Earle, a, Lansing.
Fisk, Alexander A., a, Colling.
Ford, Clem C., m, South Haven.
Fowler, Richard C., m, Detroit.
Fryman, George R., m, Berrien Springs.
Gardner, Victor R., a, Lansing.
Gunnison, Alta, w, Dewitt.
Gunnison, Eddy J., m, Dewitt.
Hach, Charles A., m, Saginaw.
Haftenkamp, Joseph P., m, Grand Rapids.
Hinds, Sherwood, m, Stanton.
Hinkson, Bertha, w, Lexington.
Howard, Frederic B., a, Ionia.
Hunt, Horace S., m, Jackson.
Jackson, Bernice M. w, Gregory.
Johnson, C. Ernest, m, Lansing.
Johnston, Frederick L., m, Reading.
Jordan, William F., m, Morrice.
Kenny, E. Gerald, a, Chief.
Kratz, Frank J., m, Albion.
McAlpine, Bruce, m, Jackson.
McNaughton, Katherine, w, Middleville.
Newton, Robert S., m, Jonesville.
Nichols, George W., m, Grand Rapids.
Oven, Harry C., a, Dearborn.
Paddock, Bessie K., w, Three Oaks.
Palmer, Joel G., a, Orleans.
Phillips, Bessie, w, Davison.
Pickett, Anna E., w, Okemos.
Place, Edward C., a, Lansing.
Raven, Paulina, w, Brooklyn.
Reed, Clarence A., a, Howell.
Richardson, Sadie, w, Bath.
Robinson, Walter P., m, Detroit.
Rupert, Edna, w, Dunkirk, N. Y.
Schaefer, John E., a, New York, N. Y.
Smith, Nelson J., a, Frankfort.
Southwick, Sophia I., w, Houseman.
Stephenson, Mark G., m, Memphis.
Sterling, Clarence D., m, Detroit.
Stevens, Ralph T., a, Santa Barbara, Cal.
Stimpson, Clarence A., m, Mackinaw City.
Stringer, Clyde W. m, Otisville.
Strong, Wilfred, m, Kalamazoo.
Swales, Charles E., a, Detroit.
Taft, Lillian, w, Agricultural College.
Talladay, George F., f, Auburn, N. Y.
Thomas, John L., Hopkins.
Tuttle, H. Foley, a, Detroit.
Wessels, Phillip H., a, Flint.
Wilcox, Ernest A., m, Washington.

The degree of Master of Science was conferred upon James G. Moore, of Shepherd, Michigan. The subject of his thesis was "Effects of Super-heated Soil on Plants."

The degree of D. Sc. was conferred upon Prof. A. J. Cook, of California. President Snyder in conferring this degree said in part:

"This College recognizes in Albert J. Cook, of the class of '62, who for twenty-seven years served this institution as Professor of Zoology and Entomology, one of its oldest sons whose loyalty has never wavered; whose tireless energy and indomitable will, whose keenness of intellect and conscientious fidelity to duty have placed him in the first rank of his profession. I am authorized by the State Board of Agriculture to confer upon him the degree of Doctor of Science.

President Snyder was enabled, on the plea that the faculty should be represented upon the rostrum on this occasion by its senior member, to induce Dr. Beal to accept a seat with the speakers of the day. He was therefore taken completely by surprise when asked to arise and listen to the following words:

"William James Beal—You have served this institution for thirty-four years very faithfully and very efficiently as professor of botany. You have, by your writings and your investigation, brought to it honor and fame. In recognition of your standing as a scientist, of your ability as a teacher, and of your great service to this institution, it gives me great pleasure on behalf of the State Board of Agriculture to confer upon you the degree of Doctor of Science."

PLEASURE: ITS LEGITIMACY, LIMITATIONS, AND COSTLINESS.—Ecclesiastes 11:9.

BACCALAUREATE SERMON BY REV. W. B. JENNINGS, OF DETROIT.

Pleasure; its legitimacy, its limitations, its cos'liness,—this is the reading of these words, words spoken originally to young people: not as *young* people only, but as those standing at the beginning of life, the point "where brook and river meet." The text is a wise man's counsel for life, for the whole life. In a sense they are the key to life, and worth our study.

I. Pleasure, as one of the ends to be sought in life, while not the highest, is entirely legitimate.

1. In the very constitution of human nature God has so planned that every natural function gives pleasure. Indeed, one remarks that "pleasure is Nature's premium on healthy exercise of function." Eating, drinking, muscular exercise, what sources of real delight they are to us! The same thing is true of our mental faculties, of memory, reason, will. Some of the keenest and most lasting joys come from their normal working. And love in its various forms, friendly, conjugal, filial, parental, which is the outgoing of our hearts to other hearts, is the chief human joy. Sin has to an extent perverted all these functions of body, mind, heart; but still in their exercise along the lines of the divine intent they give pleasure, because God ordained it so.

2. The constitution of the outside world, also, attests the legitimacy of pleasure. The world, as well as man, is God's workmanship. The one corresponds to, fits, the other. The two constitute the whole hinge, each being useless, inexplicable, without the other. The world ministers to man's joy in the exercise of all his functions. Much of our delight comes through the eye trained to see things; and the world is painted in colors correspondent to, sympathetic with every mood of the soul. The delights of the ear in harmonious sounds finds abundant gratification in the wealth of music with which the brooks, the birds, the winds, the ocean waves, the gentle rainfall, the pealing, booming thunder, sing to the soul. A comparatively colorless, musicless world would have done quite as well as a place to live in and work in; but O! how much less gladsome it would have been. God made his world in its multifarious, ever varying beauty that his children might be glad in it.

3. The Scriptures prove the legitimacy of pleasure. The Bible is the brightest, gladdest of all books. Strange that any man should think it gloomy. Strange that any should feel like coming to it in trouble-time only. True it does record the dark, depressing account of man's sin; but this is for background only to bring out the glad and gladdening story of God's love. The one burden of the Book is love, God's love for man. Surely this ought to provoke joy. There are messages of joy, "I bring you glad tidings of great joy." There are commands to joy, both in the Old and New Testaments, "Rejoice in the Lord alway; and again I say, Rejoice." The Book tells of Christ's gift of joy; "My joy I give unto you, that your joy may be full." It abounds in directions for the pursuit of pleasure, that men may be saved from seemingly promiseful avenues that quickly issue in utter disappointment. Pleasure, what it is, where it is found, how it is to be obtained, the modes and manner of its communication—this is the purpose of the Bible, and this very fact attests the legitimacy of pleasure. The very first word of the risen Lord, in which He greeted His disciples, and which sums more completely than any other word the spirit and intent of the higher life, is, not "All hail!" as in our English Version, but, literally, "Rejoice," "be glad!"

4. If we needed anything more to confirm us in our opinion as to the rightfulness of pleasure, we have it in the practice of Jesus. John Baptist came as an ascetic, clothed in coarse clothing, fasting, dwelling apart from men. Christ came in just the opposite spirit and led a totally unlike life—came eating, drinking, mingling with men. He led no hermit life, but frequented public places where men met in crowds, travelled the thronged highways, repaired to synagogues and temple, was present at feasts, weddings and religious festivals. He delighted in flowers, birds, music, and little children. He rejoiced with those who rejoiced as often and as genuinely as He wept with those who wept. Not only did Christ take pleasure, but He gave pleasure. Mrs. Oliphant says of old Giotto, one of the cathedral builders of Florence, that, "He strayed about Italy from town to town, among the feastings and the fighting, here leaving a mild-eyed madonna, there a group of saints in glory; * * * jogging cheerfully along for pleasure and profit, everybody's friend, * * * and betraying his course wherever he went by something beautiful, some bit of rude common wall blossomed into an immortal thing." So Jesus walked up and down the world, "shedding joy and gladness wherever He went."

Good words, like good people, sometimes fall into bad company, and then are judged by those with whom they associate. So it is with the word "Pleasure." Itself without fault and indicative of a thing essentially good, it has come to be looked upon as synonymous with certain forms of worldly indulgence, with revellings, and even with unbridled sensuality. We need to restore the word to its right meaning,

we need to rescue the thing itself from the captivity into which it has fallen. Charles Wagner says somewhere, "Our fathers delivered the holy land from the infidel. There is another holy land which brigands, thieves, the profane, pollute every day. It is the land of laughter and pleasure. They have so thoroughly ravaged and disfigured it that it is not recognizable. But by the God of springtimes and of the stars, by the loving kindness which gives the fresh laugh to the lips of childhood and the sweet intoxication to the heart of youth, this holy land shall not remain in the hands of infidels. It is ours, and we shall regain it." Pleasure is not "heresy" as another charges.

It is right to be glad. What this old sin-blighted, sorrow-driven world of men and women want and should strive for is more pleasure. Pleasure is duty! Have the courage to be happy!

II. In adding the word "but" to the word "rejoice," as the text does, there is the suggestion of some limitations to pleasure. Yet even these limitations must not be thought of as intended to curtail, but rather to regulate, and so, in the end, both to intensify and perpetuate, our joy. I think that the goodness of God and His desire for our happiness are nowhere more manifest than in the fences which he has put about us.

1. The pleasurable exercise of any function must not be carried to the extent of overtaxing, and so injuring, the organ or faculty involved. There are many homely proverbs in the Bible collection which bears that name, which express much wisdom. Here is one;—

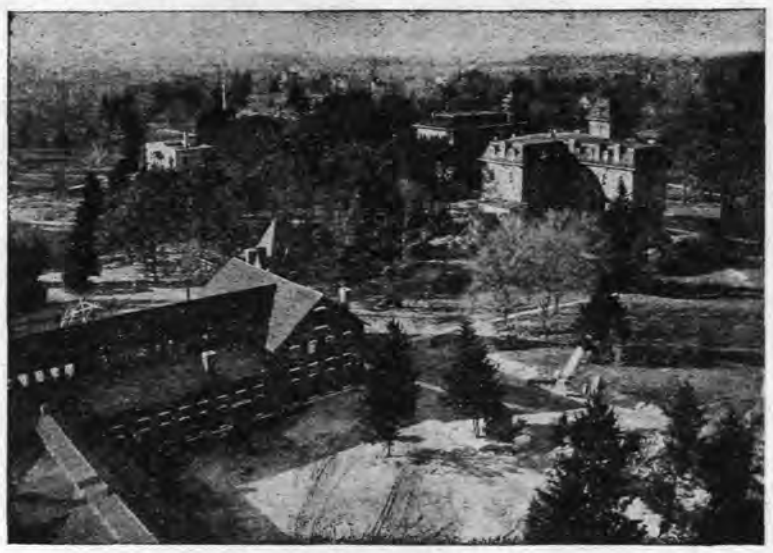
"Hast thou found honey? Eat so much as is sufficient for thee,
Lest thou be filled therewith, and vomit it," (25:16).

Commenting on this, one says: "There is no denial of the goodness and sweetness of honey. Not one word is spoken against the thing that is found, or against the appetite that desires it. We are not told that honey is a bad thing and dangerous to take; nor are we to'd that the appetite which desires honey is a bad appetite and needs to be crucified. Honey is good. So to eat it is perfectly proper; but the text tells us that we ought only to eat sufficient, because if we eat to excess we shall surely punish ourselves. That is a wonderful law of nature. It is marvelous to notice how our appetites are our constables—taking us up, arresting us with a strong hand, if we overindulge them. The beginning is very good. You say it is impossible to eat too much of this, it is so sweet; and before the clock has gone half-round you blame yourself almost for beginning the feast which was so delicious (Parker's People's Bible, p. 358). This is a good illustration of my meaning, that pleasure is never to be indulged in to the extent that it injures the organ or faculty involved. There are many disregardings of this limit. Novel reading is a pleasure right in itself and needed in our day of stress and strain. It is a sort of intellect-honey. But one may overread in the realm of fiction with the result that the mind is enfeebled and made unequal to the severer tasks which make up most of life. Even in our life work, worthy of the best that is in us, in the doing of which we find one of our chief joys, the very ardor of pursuit may urge to over-work, which issues in threatened or partial breakdown.

2. Pleasure must be limited also at that point where its enjoyment hurts any other part of one's nature. Man is a triparbibe creature. Or, if you question that, you admit the duality of his nature. He is body and spirit. To the healthy soul no joys are comparable with those found in spiritual exercises, the exercises of religion as we call them. But — and I am sure you will not misinterpret what I am going to say—our delight in song and prayer and Bible study may be indulged to the degree of injuring the body. Too long vigils, too great religious excitement, these rob the body of its necessary exercise and sleep, disarrange its digestion, and result otherwise disastrously. There is such a thing as too much pleasure in religion. You agree with me and say that it is very candid and praiseworthy of a clergyman to admit such a thing. Now I ask you to be just as honest, and admit that there is such a thing as indulgence in bodily pleasures to the extent that the soul is in consequence shriveled, stunted, starved. Legitimate college athletics may be allowed to rob the mind. Delight in out-door sports—and this is a temptation of vacation time—may lead us to spend the first day of the week in other ways than the worship of God and the soul's culture in holiness. Pleasure pursued to the point of invasion of some other department of one's being becomes sin.

3. Pleasure finds a third limit when in its enjoyment a fellow-man is hurt. A man is not a mere individual. He is a member of a great social organism. He is bound with all other men and women. He is under consequent obligation to regard their pleasure as well as his own. The divine command is the fundamental law of sociology, "Look each of you to his own things, but each of you also to the things of others," (Phil. 2:4). And yet how often is it that in seeking some personal pleasure one is utterly regardless of others. President Hyde, of Bowdoin College, says forcefully, "We may not buy pleasure with the life blood of our fellows; we may not purchase it at the cost of human degradation. * * * Against opera or drama [as such, we may interpolate] no lover of his fellows has a word to say. When, however, for the spectacular embellishment of the performance, woman is asked to put off that modesty which is her robe and crown, when the accessories of the exhibition are such that we would be unwilling to have one dear to us take part in it, then we are buying our pleasure with the red blood of a human heart and the stained whiteness of a sister's soul, —a price no true man will let another pay to procure for him a passing pleasure.

The real reason why a true-hearted, noble man cannot walk in ways of licentiousness is not the selfish fear of physical contamination or social reprobation. It is because he cannot take pleasure in the banishment of a daughter from the household of her father; in the infamy of one who might have been a pure sister in a happy home; in the degradation of one who ought to be a wife, proud of the love of a good man and happy in the sweet joys of motherhood. On this point our social standards are still barbarous and our moral insight undeveloped. The man who has eyes to see things as they are; the man who can realize the cost of shame and degradation to others which they involve; the man who can see this and still seek pleasure there, is a man whose moral affinities are with the bygone brutality of the Roman populace that found delight in seeing Gladiators die, with the slave-drivers who forced human beings to labor with the lash. I care not how high such a man may stand in social circles. He is a man with a cold, hard, cruel, callous heart; a creature capable of finding a beastly satisfaction in drinking human blood." (God's Education of Man, pp 94, 95). A man recently said to another, as they "passed a poor, painted creature of the street, 'the man who won pleasure by the degradation of that woman is a modern cannibal.' 'No,' he continued firecely, 'he is worse than a cannibal, for he not only destroyed her body, he ate her very soul.'" (Hunter, Poverty, p 253).



BIRD'S-EYE VIEW OF A PORTION OF CAMPUS.

There are some limitations to the enjoyment of pleasure. Let me summarize them. Pleasure must not be indulged to the extent of injuring the organ or faculty, in the exercise of which the pleasure is had; it must not do violence to any other part of man's composite nature; nor must the price paid for it be any wrong done to a fellow human being. Transgressing any of these bounds, pleasure is sin and quickly becomes pain. An old writer put it thus, "Pleasure must first have the warrant, that it is without sin; and then the measure, that it is without excess."

III. A third great fact is implied in the text, rather than written upon its face as were the two truths already considered. It is, the costliness of pleasure.

In one of Robert Louis Stevenson's prayers is this petition, "Deliver us from fear and favor; from mean hopes and cheap pleasures." Are pleasures ever "cheap?" In the sense of more or less enjoyment —perhaps. For there are gradations of delight. Physical pleasures stand lowest in the scale. Then come pleasures of the mind. Vastly superior are these. But above them, far in the heights, are spiritual pleasures. When the wise man speaks of the pleasures that are above valuation in terms of wealth, he means pleasures of soul, really, the pleasures of religion. It is indisputable that religion is the chief pleasure. In comparison with this all others are cheap, in the sense of a lower sort. So said Solomon, no theorist, but one who had explored to the end every avenue of pleasure, who had sounded every shoal and depth of delight. O! I envy not the joy of him who has known to the utmost of rational indulgence every bodily pleasure; nor his whose experince embraces the highest pleasures of the mind; if with these they have not known the diviner delights of him who is right with God.

But there are no pleasures which are cheap in the sense of being without cost. John Foster said long ago, "All pleasure must be bought at the price of pain. The only difference between false and true pleasure is that for the true the price is paid before you enjoy it—for the false, after you enjoy it." These words are weighty enough to merit repetition.

See how large is the cost of false pleasure, which is only another name for pleasure which has gone beyond the limits already indicated. Drink costs at the first but a few cents. The last cost one finds to be health of body, clearness, balance of mind, the sacrifice of the soul's life. Other forms of physical pleasure may be had seemingly at low price, a few dollars will suffice, but the real cost is one's soul-whiteness, one's self-respect, and the respect of all noble men. The pleasures that lie beyond the bounds indicated are as illusionary and disappointing and enslaving as was the imagined liberty that lay beyond the ten commandments to the young man in our Lord's story. The real, the heavy, the frightful cost of false pleasures is nowhere more vividly, more awfully told than in our Lord's unanswered and unanswerable question, "What doth it profit a man, to gain the whole world, and forfeit his life? For what should a man give in exchange for his life?" (Mk. 8:36, 37).

Now contrast the costliness of false pleasure, not at their first enjoyment, but at the end, with the costliness of true pleasure. The price of every true pleasure must be paid, in heaviest part, before you enjoy it. Every true joy has its price. Religion is no exception. In one sense Lowell was right when he sang:

"At the devil's booth all things are sold,
Each ounce of dross costs its ounce of gold;
For a cap and bells our life we pay,
Bubbles we buy with a whole soul's basking;
'Tis heaven alone that is given away,
'Tis only God may be had for the asking."

But in a sense much more important this is not true. Christ tells us the cost, "If any man would come after me, let him deny himself, and take up his cross and follow me. For whosoever would save his life shall lose it; and whosoever shall lose his life for my sake and the gospel's, shall save it. (Mark 8:34, 35).

This is my message to you today. In view of the rightness of pleasure I beg you, in the word of the Shepherd of Hermas, "Put on, therefore, gladness that hath always favor with God, and is acceptable unto Him, and delight to thyself in it." But know that the domain of pleasure, though wide extended, is yet bounded. Let not these boundaries be to you what Emerson says a fence is to a schoolboy, "an irresistable temptation to jump." Remain gladly within them. And be wise enough to look far ahead, even to the ultimate cost. Be wise enough to buy the real pleasures, the payments for which are heaviest at the beginning, but lighter ever as you go on, while the degree of enjoyment grows ever greater and greater; rather than the false pleasures glitteringly alluring, which constantly decrease in delight, but demand ever heavier payments, the last which is heaven and the soul's life. The pleasures of the man who loves God, like the path of the just, "shineth more and more unto the perfect day." *Buy that!*

THE PANAMA CANAL.

COMMENCEMENT ADDRESS BY HON. CHARLES E. TOWNSEND.

I am greatly pleased with the honor which has been given me by the invitation to address the Class of 1905 and its friends on this occasion Not that I am burdened with benefits to confer upon you, for I confess I have been much perplexed in my efforts to prepare something which you will be willing to hear; but I am pleased because it brings me in touch with young men and women educated to do things.

Probably the fundamental and principal benefit derived from educational training is the habit of thinking honestly and reasoning legitimately, and when the habit is acquired from contact with natural laws, thought must be honest and reason will not evade. In the laboratory of the microscopic cell, the bursting bud, the ambitious plant and spreading tree there is no deception. The purpose is fixed; the plan is complete and the execution faithful to the formula of the great chemist. There are no devious ways in nature's path. Ignorance, superstition and bigotry may blind the student's eyes but the way is there and it leads direct from premise to conclusion, and he who has learned mathematics and language; the natural sciences and logic, amidst the illustrated lectures of nature's teachers has learned to think and reason safely and well.

He has, however, done more than learn to think. He has learned to do. He has been stupid indeed if he has failed to see a purpose in every weed and vegetable, in every shrub and tree; in every microbe and living thing; in compost and in blight; in climbing sap and falling rain; in so-called animate and inanimate substance, for in the broader sense all things live and move and have their being. Each has a work to do, and doing it fulfills its destiny. No opportunity is neglected. Quarter is neither asked nor given. You have learned that the myriad forms of life which day and night, year in and year out have swarmed about this magnificent farm are ever active, never tiring. A stronger force may for a season hold it in check, but it is ever alert to find an opportunity for renewed expression. Under such circumstances and with such teachers you have been truly fortunate. Strong in body, keen in intellect and ambitious to do, you will find a place in the world. It needs you; much of its work is not even well done. Many of those who are engaged at it are drifting away from the principles which you have learned are the correct ones and you will need to be strong indeed if policy or unworthy desire does not induce you to compromise with the ideals which you have learned are realities.

The temptations of wealth and power are most enticing, and their acquisition many times seems to have violated all laws and principles which you now respect and cherish, but the end appears to have justified the means. Be not deceived. Many of the so-called most-successful are the greatest failures. Wealth and power are desirable when properly acquired and rightly used. They become merciless taskmasters and cruel despots when allowed to control. He who has gained wealth by a proper application of the principles of wise economy, honest effort and superior wisdom, not for the sake of having, but for the purpose of using it as a means for greater and more efficient being and doing, has done well. Probably he has increased his opportunity for doing good. But he who has become rich through devious ways and then uses his money as a passport into veneered society, and as a means to purchase that for which worth not wealth is the equivalent, has gold but not true riches and it can never buy one of the priceless possessions which you enjoy, health, strength, worthy ambitions and the glorious consciousness of having in your possession a clean book in which you may write the story of a good and therefore successful life. In such a presence on such an occasion I feel it an honor to stand as commencement orator.

I have said that you have been taught to do some things, and thus have necessarily acquired the desire to do more. I take it you will be interested in knowing something about the greatest industrial and commercial project of the world, and so I have selected as the subject of my address The Panama Canal.

* * * *

After the treaty with New Granada was entered into, but before it was ratified, an exclusive privilege of building a railroad across the Isthmus was granted to a French company in May, 1847. This privilege afterwards was transferred to an American company consisting of William H. Aspinwall, John L. Stephens and Henry Chauncey who organized the Panama Railroad Company under the laws of New York and in 1855 the road was completed with a length of about 48 miles extending from Aspinwall or Colon on Limon Bay to Panama on the Pacific. France and the United States continued active in their efforts to determine the best possible location for a canal. Congress appropriated money several times for surveys and examinations. The growth of commerce and settlement of the west seemed to demand an all-water communication between the Atlantic and Pacific seaboards, but up until 1850 no records of surveys or scientific explorations suitable to form the basis for undertaking so gigantic an enterprise were found. In 1850 the American Atlantic and Pacific Canal Company employed a Philadelphia engineer by the name of Childs to make a careful survey for the Nicaragua route and his report was a valuable addition to the world's knowledge of the Isthmus. This survey and report became the basis of future canal work and was of real value. In 1869 the President in his annual message to congress suggested that the United States build an American canal on American soil for the American people. Congress took the matter up and appointed a commission to further explore the Isthmus. Tehuantepec, Nicaragua, Panama, and Darien were investigated by different subcommittees. The first was reported impracticable; the second, or Nicaragua route was reported favorable with an estimated cost of the canal of one hundred and forty million dollars. The Panama route was also reported feasible at a cost of ninety-four million, five hundred and eleven thousand, three hundred and sixty dollars. The Darien route was also reported favorably but the commission favored the Nicaraguan route above the others.

While the United States was conducting this investigation a provisional company was organized in France for the purpose of inaugurating a scheme to connect by canal the two oceans. Lieut. L. N. B. Wyse, in behalf of said company, obtained in 1876 the exclusive right from Columbia to build and operate a canal across the State of Panama for 99 years. This was a right without restriction, except if the company should select the route occupied by the Panama Railroad Company it should make satisfactory arrangements with that company. This concession was transferred to the Panama Canal Co. organized in 1879. For several years the various other routes heretofore mentioned were discussed and investigated by new companies from different nations, but it is with the French Panama Co. that our interest lies, and to it I desire to direct your attention briefly. The geographical features at the place where the canal is contemplated show that the Isthmus runs nearly east and west, and therefore the line of the canal is nearly north and south, the Pacific end being somewhat east of the Atlantic. The Cordillera mountains parallel the Pacific and are about six miles distant therefrom at Panama. From its Atlantic mouth in Limon Bay at Colon the French canal extends through low grounds or swamps to Old Gatun, a distance of six miles, where it intersects the Valley of the Chagres; it follows this valley for twenty-one miles and then takes the course of a small tributary through the mountains at Culebra which was originally 330 above mean tide at the Pacific; after passing through the mountains the course of the canal is down the valley of the Rio Grande to the Pacific at Panama. The high part through the mountains is about 6 miles long. The Chagres rises in the mountains and at its mouth near Colon it is about one-half mile wide. It is subject to great variations, rising many feet in a few hours. I personally saw it rise 12½ feet in five days.

The isthmus is covered with a tropical jungle, and the climate ranges from 69 to 95 degrees. The average annual rainfall is 150 inches. It was along this line and subject to these conditions that the Panama railroad was built in 1850 to 1855, and it was along the same line practically that the French Canal Company, which had purchased the Wyse concession was finally begun. Before the French Canal Company was formed a congress of delegates, many of whom were distinguished engineers from various nations, met in May, 1879, at Paris to discuss the question of an isthmian canal. The moving spirit of this congress was Ferdinand De Lesseps of Suez canal fame. He dominated the congress by his commanding personality and national reputation as a canal builder. After being in session two weeks it was decided that a canal could be built at sea level on the Panama route. After the congress adjourned the Panama Canal Company was organized and the Wyse concession purchased for ten million francs, or about two million dollars.

The company issued six hundred thousand shares at 500 francs each and it was all sold in 1880. In 1883 work on the canal was commenced on an extensive scale. The two great physical obstacles were the river Chagres and the Cordillera mountains. To complete the project De Lesseps had stated it might require $127,600,000, but that was the outside. The engineers of greatest ability at the 1879 congress had stated the cost would be near $240,000,000 and that the time required for completion would be 12 years. But De Lesseps' opinion prevailed and the work was begun and continued until the latter part of 1887; at that time it became evident to everyone and admitted by De Lesseps that a sea level canal could not be completed within the 8 years and so a change in plans was made and a lock canal was to be built. Under these revised plans they proceeded until 1889 when the company became bankrupt and a liquidator appointed to take charge of affairs.

Up to this time by issuing new obligations and by sale of lottery bonds under sanction of the French government nearly two hundred and fifty million dollars were raised and expended on the project. 72,000,000 cubic yards of earth and rock were removed out of an estimated total of 157,000,000 cubic yards; this estimate was for a sea level canal 29½ feet deep and 72 feet wide on the bottom which is about two-thirds of the size of the canal to be built by the United States which will require it is estimated the removal of 260,000,000 yards of earth and rock. Of the 77,000,000 yards removed by the French Company old and new, it is thought that 40,000,000 yards will be of value to the new canal, or in other words, 40,000,000 cubic yards have been removed which will not have to be removed again, or one-sixth of the work has been done; undoubtedly nearer a fifth of the work has been performed.

To him who has visited the canal zone and seen what the French

company has done, and then become familiar with its methods and principles or lack of principles, there comes the conviction that that company had a genius for extravagance. Much of the distance from Colon to Panama the railroad is lined on either side with expensive machinery, spoiled with rust and overgrown with tropical verdure. Thousands of iron dump cars, scores of steam engines, iron boats taken there in sections. On the top of Culebra is a large iron diving bell; why it was placed so far away from the water I cannot tell or why it was purchased at all is unexplained. At Emperador is a building containing, I am told, forty thousand dollars worth of steel writing pens. Well equipped machine shops where engines and cars can be built and repaired; store-houses filled with almost every implement or kind of supply which could have been bought; steam shovels and dredges. In the waters of the ocean at either end of the canal dredges and boats of the most expensive kind have been rusting and rotting for years. Over 2,400 buildings are standing along the line. Aucon Hill at Panama is literally covered on its eastern side with hospital buildings. Two palaces built for officers in a forest of palms at Colon were being eaten up by wood ants and the elements when the United States came into possession. Extravagance and wanton reckless waste was everywhere visible. Millions of dollars were spent for management and display at Paris and millions more in Panama and New York. Licentiousness and corruption of every kind run riot on the Isthmus and sapped the lives and energies of the workmen.

The misrepresentations, or at least the reckless statements made by De Lesseps to obtain money in 1880 characterized the whole work and when the French company passed into the hands of the liquidator in 1889 it was financially bankrupt, morally ruined and without credit or decency. The liquidator endeavored to rehabilitate the scheme and complete the work, but failing in this he kept the Columbian franchise alive, hoping he might be able to sell it and realize something out of it for the creditors. It had something of real value. It had acquired nearly all the stock of the Panama railroad and this was worth about $16,000,000. It had done much valuable work on the canal; for instance it had cut Culebra down from its highest point 333 feet to about 150 feet above the level of the sea. It had some machinery and tools of value; it had buildings that could be used; in fact it had about $40,000,000 worth of desirable property, but the liquidator could not realize upon it unless some purchaser could be found who could use it on that particular canal.

Where was the person or power that would attempt the enterprise? Experience had shown that nothing less than a great, wise, rich and powerful nation could hope for success. The world needed the canal and all its eyes were on the United States; she had the wealth, the engineering ability and a chief executive fitted for the work. The Spanish War emphasized the need of the canal by the United States. When Cevera threatened our eastern coast one of our greatest battleships was at San Francisco and she had to make the journey clear around Cape Horn, a distance of seven thousand miles further than would have been necessary if she could have sailed through the Isthmus. The requirements of trade demanded that the people should not be at the mercy of transcontinental roads, in fact the needs of peace and the necessities of war forced upon the country the construction of the canal. But how were we to build it? We might buy out the French Company, but its franchise or concession only extended to 1910 and probably only to 1904. A new concession must be obtained from Columbia.

Furthermore the Clayton-Bulwer treaty between Great Britain and the United States in 1850 was still in force and must be terminated or modified, for it provided that neither country would ever obtain or maintain for itself over any communication by canal between the oceans at Panama exclusive control, or would use its influence to obtain rights or privileges which the other did not enjoy. Whatever was to be done must be done for their mutual good. Now the United States was thinking about building the canal and it realized that while it was to be for the good of the world it must be under the control and protection of the United States. The Clayton-Bulwer treaty was terminated by the Hay-Pauncefoot treaty so that the United States could build, operate and control the canal; then at the suggestion of Columbia a treaty was entered into between Columbia and the United States whereby Columbia was to concede to the United States a strip of land 7 miles wide from Colon to Panama for which the United States were to pay Columbia $10,000,000 in gold and $250,000 a year after the canal was built and the United States took it subject to the rights of the French.

After Columbia presented the treaty to the U. S. it was modified in some details and accepted, but returned to Columbia for her ratification, which was expected promptly. But instead of ratifying it she demanded more than her original price and raised it to $15,000,000 and then to $20,000,000 and finally to $25,000,000. She broke her faith with the U. S., not by a majority vote of her congress, but by the unanimous vote showing there was concerted action in her infamy. Had she seen visions of the fact that her extention of time to the French company was not binding, and that she could forfeit the concession and add $40,000,000 to her price to the United States? She knew the United States had negotiated with the French company for its property for $40,000,000 conditioned upon the United States getting a concession from Columbia. In the meanwhile events were shaping themselves rapidly at Panama. The state of Panama was a part of the Columbian Republic. She was not a part by her own volition, but had been practically forced into the union without her consent. The proposed canal ran through her territory, and Columbia's course in trifling with the United States was causing Panama serious trouble. The United States was now again discussing the Nicaraguan route, and Panama's hopes and visions of prosperity and growth were disappearing. She had little in common with Columbia. She was further from Bogota when measured by time in reaching that city than she was from Washington. She therefore resorted to the South American republic's remedy, revolution, as she had done on several previous occasions and withdrew from the union. Columbia sent troops under the traitor Huertis to put down the rebellion, but he sold out to his country's enemies and the Republic of Panama was born. She was promptly recognized as a separate and sovereign republic by all the leading nations of the world, and shortly afterwards under authority of congress President Roosevelt entered into practically the same treaty with Panama that he had attempted to make with Columbia.

BIRD'S-EYE VIEW OF A PORTION OF CAMPUS.

The United States owns and operates the panama railroad, owns all the property of the French Canal Company and all the work it has done. It has a strip of land ten miles wide across the Isthmus; has agreed to protect the republic of Panama against invasion and proposes to build the canal.

It now seems probable that it will be 47 miles long, 35 feet deep, 150 feet wide on the bottom and with an average width of 300 feet at the top. It may cost $300,000,000 and may take 15 years to dig it, but will it be dug? Will it pay?

These questions quickly and universally asked are difficult to answer. I have however to my own satisfaction answered the former in the affirmative. The latter is more difficult and in the nature of things must be a rough estimate.

From the beginning of the XVI century the civilized world has recognized the great importance of a direct all water route around the world. Western Europe has been especially interested in it, and the United States has come to require it. It is necessary for us, in order as I have said, that the needs of commerce and the demands of safety of both of our s aboards may be met. Our interests are not now confined to the continent, they also extend into the far East and into the middle of the Pacific. The Philippines and the Hawaiin Islands are under our control and must be guarded. We are now a factor in the problems of the orient as well as the occident and we must be a prime factor, without which the problems must not be solved. From the days of President Monroe we have adhered to the Monroe Doctrine to enforce which the canal may be needed. Our outposts have been multiplied and our responsibilities increased. The time may come when we shall need the combined strength of our east and west. With the canal built our strength will be greater and the probabilities of peace enlarged. We are now as never before a great world power. The greatest world power. Greatest, first because it guarantees the widest individual freedom to the best, most patriotic and intelligent class of citizens to be found in the world. Second, because while its policy is one of peace it is able to defend those rights the submission to a violation of which means weakness and national disaster; and third because it is progression and ever on the alert to promote the general welfare of its citizens, and to lead in the world's march of material and moral development.

Every worthy motive appeals to our government to complete the enterprise. It has undertaken the work, it will be difficult to abandon it. It has the disastrous experience of the French company before it. The mistakes of this company will be valuable lessons to the United States. The climate is hostile to northern labor, but acclimated workmen can be obtained. They are not the most desirable. One American laborer is worth two of the South Sea kind. Thousands of men were sacrificed under the French contractors, but the laws of health were ignored and pestilence was an invited guest. Already under United States control the cess-pools of filth and the breeding places of disease are being destroyed and made clean.

At the time the Interstate and Foreign Commerce Committee of the House of Representatives visited the Isthmus last November they found 400 marines at Emperador on the line of the proposed canal where they had been for over 10 months and no death or serious sickness had occurred among the number; this shows what the observance of the ordinary laws of health will do.

There are some stupendous obstacles in the way of the proposed canal, but they are not insuperable. At the time of the original estimate of $180,000,000 for the cost of the waterway a canal with locks was contemplated. I believe the wisest engineers now believe that a sea level canal should be constructed. This will mean more work and greater expense, but the cost of maintenance and operation will be greatly lessened and the benefits greater. The best is the cheapest in the long run. But the cost will depend largely upon the ability, integrity and honesty employed. Too frequently public jobs are the opportunity for public graft. The management and control of so great

an enterprise will have the disbursement of millions of dollars for supplies and work. Temptations to profit from such disbursement will be great, and the government may suffer. But with our present great Executive at the head the way of the transgressors will be hard. Already some wholesome lessons in civic righteousness have been taught, and the work will be inaugurated under a system best calculated to get full value for every dollar expended.

Ladies and gentlemen, I have occupied more of your time with this great subject than I should, but the greatest industrial and commercial enterprise in the world's history, having its origin in the 16th century demands for its discussion even more time than I have consumed. It is not the only subject which you will have an opportunity to study. Others are pressing for attention. The ability, honesty and integrity which I have mentioned as requisite to a successful canal are needed in all. Character and ability in every duty and vocation helps, not only to build canals but to build up a people worthy of the greatest respect and honor. I congratulate you upon your deserved advancement and trust you will become the useful citizen, which the State expects you to become.

THE FORWARD MOVEMENT IN PLANT BREEDING.

VICTOR R. GARDNER.

When we consider that one-half of all human effort is employed in the food and textile industries and that the materials of both are agricultural products, the larger factors at least which enter into their production will be seen to be of the greatest importance. Anything which will lessen the cost or better the quality of a fabric or a food must of necessity interest a majority of the people. Improvement in the articles of these industries has come about through better methods and through better materials. It is with this improvement of materials that plant breeding has to do. Indeed, plant breeding is at the bottom of most progress along agricultural lines, for without better plants and *more* of them improvement in methods of handling them would be limited.

Formerly the plant breeder was regarded with suspicion. He spent the most of his time in promiscuous hybridizing, cultivating foreign plants, or producing rare and monstrous forms. Charmed by the novelty of the phenomena he produced, he kept on experimenting, forgetful of any definite object which he may have originally had. It became a mere game of chance with nature, played for the gratification it afforded. Many important varieties and types of plants have originated in this way, and this kind of experimenting has been far from unfruitful. But as the laws of Nature have come to be more fully understood and her various phenomena have been explained one by one, as she has gradually disclosed her secrets to the careful investigator, plant breeding has lost some of its mysteries. New men have gone into the workhouse of nature and, armed with the teachings of science, have demanded that under their guidance she shall produce forms to meet their ideals. With definite ideas as to the yield or chemical content of a cereal, the shape or quality of a fruit, or the color, size, or fragrance of a flower, they have set about to so combine the forces of nature as to produce these results, and they have succeeded. Plant breeding is no longer a game of dice, loaded perhaps against you. It is a definite process for a definite end.

Probably no class of plants is worthy of so much attention as the cereals — wheat, corn, oats, rice. They receive, at least, half the cultivation given to the plant kingdom. In the United States alone over 2½ billion bushels of corn are raised annually. Selection is without doubt carried on more carefully with this cereal than with any other. Every careful farmer selects his seed corn. Yet in Illinois alone, systematic concerted efforts have been made to improve it. Here individual growers, corn breeder's associations, farmers' clubs, private companies, and even school children have united in an attempt to breed corn which will yield more to the acre and contain a higher per cent. of oil and protein. Observation has shown these people that long, slightly tapering ears, with small cobs and deep firmly packed, wedge shaped kernels in straight parallel rows yield the most shelled corn to the bushel. Chemical analysis has shown further that there is great variation in the chemical content of kernels from different ears, but that the composition of different kernels from the same ear is fairly constant.

Now corn starch is worth about one cent per pound, corn protein about a cent and a quarter, and corn oil about five cents. This at once suggested selecting seed ears not only with good conformation but with high percentage of oil and protein. It was also found that the oil is contained mainly in the embryo of the kernel, and hence selection sought on for larger embryos. This process has been kept up season after season till today types of corn have been developed yielding 25 per cent more oil and 15 per cent more protein than formerly. The result has been that within the last 15 years 25,000 square miles of corn land has risen $5 per acre in value, due alone to the improved types of maize. This means seven million dollars of added wealth to Illinois in the valuation of her land alone, to say nothing of the wealth accruing during these 15 years from the increased yields.

In Minnesota at the present time efforts are being made by the experiment station to increase the yield of wheat. Already varieties have been secured which will yield a fourth to a third more than the old sorts. Every year this increased product will mean two or three millions added income to the farming population of that state; and if this practice were extended over the entire wheat-producing west it would mean a hundred millions to us annually. (Within the reach of every farmer lie the means to greater wealth; yet too often it is not until we see ourselves being pushed to the wall by the industries of our neighbors, that we spur ourselves to action).

Thirty years ago it was thought that Georgia and the Carolinas were the only states that could raise rice. They could not produce enough for our home consumption and millions of dollars worth was imported annually. Then someone discovered that better rice could be grown in Texas and Louisiana than on the Atlantic seaboard. In 15 years ten million dollars was added to the wealth of those states through the rice industry; and the indications are that we will soon export this cereal.

For years the great staple of the South has been cotton, and well might the southern plantation owner be proud of his cotton fields at harvest time. Yet the cotton industry has not been without its discouragements. A few years ago it was hampered by the prevalence of a fungous disease which attacked the roots of the cotton plant, ruining whole plantations. The boll weevil was completing above ground the work that the fungous left undone below. Plant breeding came to the rescue. Types resistant to the disease were selected and bred. Today the cotton weevil is no longer a terror to the cotton grower, and indications are that the ravages of the boll weevil may finally be held in check. In addition to this, cotton with a longer and finer staple has been produced. South (?) Sea Island cotton has been brought here, cultivated, hybridized with our own sorts and expensive foreign importations reduced.

But if plant breeding has done much for the cereals and fiber plants, it has done even more for the fruits. When the necessities of life are provided and its luxuries sought, more attention is paid to quality and less to quantity. Thus, after the cereals have provided us with the necessary food for existence, we seek to satisfy our higher physical wants with fruits. Plant breeding must meet these demands with better qualities, finer flavors, and more delicate tints and aromas.

Probably no fruit better illustrates progress in plant breeding than the grape. The story of its evolution in America reads like a romance. A century ago grape culture in the United States was practically unknown. All attempts to grow the European varieties were without success. Then someone began cultivating the wild species. Seedlings were raised. Among them appeared the Catawba; then Ponds Seedling; and then the famous Concord. Viticulture in America was now on a sound basis. The next step was to hybridize these standard American sorts with the European species, but the cross was too violent for the best results. Then followed the method, which is now being employed, of crossing these hybrid plants with our own sorts. Gradually the Vinifera blood of the European species is being infused into that of our native species through these attenuated hybrids and a superior family of American fruits produced. Already we have fully a thousand varieties suited to a wide range of soil and climate conditions.

With over 4,000 varieties of apples there isn't a farmer in America that should be without this king of fruits. A hundred years ago the pioneers of the great northwest took along apple seeds and planted them. The seedlings grew, but soon the hot, dry winds of their arid summers, or the cold of their bleak, cheerless winters withered or froze them. The settlers were discouraged and apparently the northwest was to be a fruitless region, growing nothing but her worthless crabs. But plant breeding came and conquered the northwest, not with irrigation and windbreaks, but in the face of her own heat and wind and cold. Literally millions of seedlings were grown; varieties from northern Russia and Siberia were imported; the native crabs were selected and hybridized; and all these were crossed and re-crossed, till today the northwest has an apple flora of her own — made not of her native crabs, not of eastern varieties, nor of the Russian types, but of all these — best suited to her own conditions.

The evolution of our native plums, our strawberries, and our tomatoes has been even more phenomenal. Suffice it to say that varieties have been produced which aim to satisfy every condition of soil, climate, and market.

Forty years ago a commercial greenhouse was unknown. Today it is estimated that 1,000 acres are under glass for the forcing of vegetables and ornamental plants, representing an annual output of twenty-five million dollars. Go into one of the ranges of greenhouses covering 14 acres near Chicago or into one of the smaller ones near our own Grand Rapids at Christmas tide, see perhaps an acre of roses or carnations or violets in full bloom, and then decide whether or not plant breeding which has made possible these types of plants has not made the world more beautiful and better. Ask the proprietor if it is not profitable.

A discussion of plant breeding would be incomplete without a mention of Luther Burbank, the man who probably has done and is doing, more for plant breeding than any one else. Patiently, tirelessly for the past 30 years he has been at work on his farm at Santa Rosa, Cal. During this time he has raised hundreds of millions of plants, working with over 2,500 species. He has not only given to the world huudreds of valuable new varieties, such as the Wickson plum and Burbank potato, but he has actually produced new species. He found a weed on the hills of New York. He took it home, cultivated, selected and improved it, in ten years the result was the Shasta daisy. He has crossed the plum with the apricot, producing an entirely new fruit, the plumcot. He has produced pitless plums and thornless blackberries of wonderful quality and productiveness. He has made a hybrid walnut, whose nuts are three times the size of an ordinary walnut and which grows as large in a season as its parent will in a generation,—indeed, he has made the walnut the fastest growing tree in the temperate zone. His really superior varieties are many, his novelties numberless. Just now the creation which promises to be of greater economic importance than all his past work put together is his edible cactus. He has taken the cactus of the prairies, bred out its spines and woody spicules, increased its size and vigor, trained it to withstand heat and cold and drouth, and made it a veritable storehouse of wholesome food and nutriment. With it the desert regions may be made to bloom and millions can thrive on food from land heretofore unfruitful. These are but a few of the things he has actually accomplished. He has others planned which promise even more to humanity.

All this plant breeding means two things to the consumer of plant products, — lower prices and better qualities. To the larger part of

mankind will be afforded more of life's luxuries in the shape of wholesome fruits and vegetables and more of its beauties in the shape of flowers and ornamentals. In short, plant breeding is making possible a higher plane of living.

The outlook in plant breeding is bright. Enough has been accomplished to demonstrate that the field is fruitful. Much yet remains to be done. Varieties need to be bred resistant to the inroads of bacteria, fungi and insects. Qualities, flavor, and aromas without end need to be added, taken away, strengthened, or blended. Hundreds of wild species may be made to yield tribute to man. Whether on the arid prairies or the snow-capped mountains of the west, the shifting sand dunes of Michigan, or the dismal swamps of Florida, Nature is there with some form of vegetation. She gives the suggestion, it only remains for man to heed that suggestion, act with her, and make these places one and all contribute to our happiness and welfare. The movement is forward, for a wiser cultivation and a better people.

THE DEVELOPMENT OF ELECTRIC TRACTION.

The nineteenth century was a period of unprecedented growth in the field of invention and scientific discovery. During these years many ideas were suggested and developed which have had a great effect upon a number of long established customs. The steam railroad, the harvesting machine, the sewing machine, the gas engine, dynamite, Bessemer steel and the steam turbine, each of which has had a remarkable influence in its own field, all stand as products of man's genius during the last hundred years.

More wonderful, however, than any others, and more familiar, are the discoveries and inventions made in the electrical field. The telegraph was a marvelous achievement of science and has been far reaching in its beneficial influence. The introduction of the telephone formed a startling departure from the established methods of communication, while the application of electrical energy to illumination soon afterward, was the cause of renewed surprise and interest. Among all of the developments in the science of electricity, however, the one which has had the most remarkable growth and which promises most for the future is its application to the production of power, with special reference to electric traction, investments in which field now greatly exceed those in telegraphy, telephony or electric lighting.

Previous to 1861 experiments with respect to transportation by means of electrical energy were not of much practical importance owing to the fact that the only source of electricity open to experimenters was the primary battery. The large number and consequent cost of the batteries needed to obtain a sufficiently powerful current made commercial success for a time impossible. After the invention of the continuous current dynamo in 1861 and the discovery, a few years later, that it could be used as a means of obtaining power also, if an electric current was supplied to it, experiments in electric traction were made with a more hopeful prospect of success. The pioneers in this new field of electrical science —Siemens, Field, Edison, Van DePoele, Daft and others—made many interesting and valuable experiments and contributed greatly to the rapid development of the electric railway. Between 1879 and 1884 many short experimental lines were built, and their success promised much for a future growth.

The building of electric railroads as a commercial venture may be said to have begun in 1884. In that year one was installed on the streets of Cleveland and entered into competition with the lines operated with horses. The new system was quite successful but its growth was slow owing to the difficulty of establishing public confidence in its practicability. In the next two years a number of improvements were made and electric roads were established in several other American cities. The first important installation of electric motive power for transportation purposes was made in Richmond, Virginia, in 1887, and its success gave a great stimulus to the development of the industry. From that time its future was assured. Its growth was rapid, and from a total of 48 miles in 1887 the mileage of electric roads today has increased to 30,000—certainly a good showing for eighteen years of operation.

The reasons for this growth of electric traction are found in its great applicability, and ease and convenience of operation. The slower transportation provided by the horse car and the increased comfort of the electric car were sufficient grounds for the abandonment of the former in favor of the latter system. The greater cost of establishing a cable line on new streets, as well as the greater simplicity of the electrical system were arguments which operated to its advantage, while the cleanliness and convenience of electricity as compared with steam in the operation of suburban roads have led to its almost universal adoption for this purpose.

From this last application of electricity many benefits have been derived. The facility of temporary escape from the crowded districts of large cities which it offers enables many people to obtain a needed change of scene and the benefits of country air. It furthermore tends to build up the country surrounding the cities, since it makes it possible for business men to reside at some distance from their place of employment. Because of the facilities which electric traction gives, manufacturing industries may be established in the suburban districts, thus aiding in their growth.

At first, electricity was applied to the surface city railways alone, but it was not long until it began to supplant steam in the operation of elevated roads in the large cities, and today it is in general use for this purpose. Besides its use on elevated roads electricity is also used as a motive power in driving cars through tunnels built under the streets of the large cities. Splendid examples of this late development of electric traction are found in New York and London where, after the expenditure of vast sums of money and years of labor, systems of railways have been built beneath the surface of the busy thoroughfares, the whole undertaking standing as one of the greatest achievements of modern engineering skill. Instead of being limited like the surface cars, to a speed depending upon the conditions of traffic on the streets, these underground or subway railroads can be operated at a high speed and on a time schedule, being entirely free from outside influences and stopping only at regular underground stations connecting with the street surface above. The saving of time effected by means of this high speed and regularity of service is of considerable importance and it is probable that the success of the systems already built will lead to the construction of similar subway systems in other large cities. In addition to passenger service electric traction has found an extensive application in mining work and in the hauling of freight on city lines. For this work electric locomotives equipped with powerful motors and hauling trains of several cars are used.

Methods of track and roadbed construction as well as the equipment of the cars, have changed greatly since the first introduction of electric traction. When electricity began to displace the horse as a motive power the old horse-car tracks were utilized and did quite well until the increased speed and weight of later types of the electric car made heavier rails necessary to the comfort of the passengers. The first cars weighed three or four tons and were about four horse-power. today many of the interurban cars weigh forty tons and the horsepower aggregates three hundred. To accommodate this increase in weight and power, more careful attention was given to the grading and ballasting of the track, in addition to using heavier rails and a broader gauge. The present practice of important electric roads is to make use of the standard rail and gauge of the steam railroad, so that their road-bed construction now compares very favorably with the best of the latter.

The cars have also changed greatly. The main object of the first builders of electric railways seems to have been to transport the passengers without too much danger to their lives and without regard to their personal comfort; but the large interurban car of the present time is built to run smoothly, its interior is beautifully finished and everything is provided that tends to increase the comfort of the passengers. Sleeping cars are even provided on some of the long electric roads.

The three best known methods of obtaining the electric current which supplies the cars are: the overhead trolley system, the third rail system and the conduit system. The overhead trolley system consists simply of a copper wire of proper size supported above the center of the track and furnishing current to a small revolving wheel, which is kept in contact with the wire by means of an iron trolley pole. The current, after passing through the latter, is conducted by means of insulated wires to the motors, first being carried through suitable regulating devices.

Although the overhead trolley does very well for city traffic and the small suburban roads it has been found that the demands of interurban traffic are so heavy that some other method of supplying current to the cars is desirable. For this purpose the third rail system has been used on a number of interurban roads and has proven to be very successful. In this system the current is supplied by means of an ordinary rail which is most commonly supported on the ties a short distance outside of the running rails and elevated several inches above the roadbed. An iron casting called a contact shoe is supported on the sides of each truck of a car in such a position that it rests directly upon the third rail. A vertical movement of the shoe, to provide for inequalities in the level of the track, is made possible by means of toggle joints. Current is supplied to the third rail, from which it is conducted to the motors through the contact shoes resting upon this rail. To protect the top of the rail from sleet and snow some roads have been constructed with an iron covering a short distance above the rail, so arranged as to allow a properly shaped contact shoe to enter an opening between the rail and the iron roof.

In large cities the poles and wires of an overhead trolley system are not only unsightly, but form an obstruction upon crowded streets, and since the use of a third rail is impossible on account of danger of shock the conducting circuit is sometimes placed underground. A conduit provided with a slot running lengthwise in its upper side is built beneath the center of the track and two uninsulated metallic conductors are supported beneath the slot. An iron rod carrying two contact shoes and hanging from the bottom of the car, runs in the slot and presses the two shoes one against each conductor. One of the metallic conducting strips thus acts as a source of supply and the other as a return circuit. In the overhead and third rail systems the rails upon which the cars run form the return path of the current, but because of the difficulty of forming good electrical connection between the ends of the rails some of the current passes through the ground and tends to cause great damage to underground pipes, through the electrolytic action which it induces. For this reason the metallic return system, as exemplified in the conduit construction, is far superior.

With the improvements in track construction and the motor equipment there has come about a great increase in the speed of electric roads. For a number of years the maximum rate attained was 20 miles an hour. Today the large interurban cars can easily travel at the rate of 60 miles an hour, while upon an experimental road in Germany a specially constructed car recently attained the great maximum speed of 130 miles an hour, a result which although quite interesting was secured at too great a cost of operation to be of immediate importance.

The last few years have produced such a great development in electric traction that it is difficult if not impossible, to prophesy what the future will bring forth in the way of further advancement. The alternating current motor gives promise of great results and it is very probable that in a few years many roads will employ the alternating current in preference to the direct current system, which is in such general use now. Some of the leading electrical engineers predict that electric traction will eventually supplant steam on the great trunk lines and that the steam locomotive is doomed to final rejection. While too much faith must not be placed in the truth of this assertion there is no doubt that there is a great future in store for electric traction and that the success of the system is assured.

THE HISTORY OF WOMAN'S EDUCATION IN THE UNITED STATES.

There is perhaps no question of universal interest toward which mankind has been so consistently and unworthily conservative as that of woman's education. It has taken several thousand years for the world to consent to educational freedom for women. Several thousand years to win the mere acknowledgment of the right to think and know; this is the tardy gift to its daughters of a civilization which boasts itself the culmination of the world's life time of development.

We have little evidence that our forefathers of early colonial days felt the importance of education for their daughters. It is probable that in the home many of them learned to read and write, but this was the extent of their education with the exception of the domestic training they received. The Dame schools were, however, open to girls from the start, although their special function was to provide the boys with the rudiments of English as a preparation for the grammar schools.

As time went on grammar schools increased in numbers, but we find only occasional instances where girls were admitted to their privileges until 1784 when Dorchester voted "that such girls as could read the psalter be allowed to attend the grammar school from the first day of June to the first of October."

The eagerness with which the girls availed themselves of any educational privileges granted them was taken advantage of by private teachers and several private schools were opened. At Medford, Massachusetts, an institution for girls dignified with the title of "Academy" was opened in 1789 and was the first of its kind in New England. Bradford Academy founded a little later originally admitted both sexes, but the girls gradually displaced the boys and for many years it has been one of the best known schools for girls in the East. In its early days the course of study consisted of Geography, Rhetoric, Pope's "Essay on Man," Grammar, Composition, embroidery on satin, and the study of the Bible.

In other parts of the country we find less willingness on the part of schools to admit girls than was the case in New England. In the South, the home was generally thought to be school enough for them and the household duties a sufficiently extended curriculum.

When it had been proved beyond a doubt by the academies and seminaries for women, which sprang up during the early part of the nineteenth century, that sex differences were not of so much importance in education as had been supposed, institutions of a still higher grade were founded. Some of the academies by adding a year or more to their course of study became colleges; while at the same time new institutions sprang up in considerable numbers. The colleges for men, too, when the entire feasibility of co-education had been established by the secondary schools, opened their doors to women and today as a result of all the moves in the direction of higher education for women, there are three classes of educational institutions which admit them; first, colleges for women upon distinct and separate foundations; second, women's colleges affiliated with universities for men; third, co-educational institutions in which both sexes have equal privileges.

Of the three classes the first was the earliest in the field, the third but a little later, while the second is the product of the latter part of the nineteenth century.

The so-called "four great colleges for women"are Vassar, Smith, Wellesley, and Bryn Mawr. The intention of Matthew Vassar in founding Vassar was to found and equip an institution which should accomplish for young women what our colleges are accomplishing for young men. At the opening of Vassar in 1865 the trustees and faculty made an honest attempt to discover and introduce certain modifications in the system of intellectual training then in operation in the best colleges for men. They planned from the start to give much more time to accomplishments, such as music, drawing and painting, than was given in men's colleges, and this *example* was followed ten years later by Wellesley and Smith. These accomplishments; however, have gradually fallen out of the course and neither Vassar nor Wellesley allows time spent in them to be counted toward the bachelor's degree. Smith, alone, of the colleges of its class still permits nearly one-sixth of the whole college course to be devoted to accomplishments.

Smith and Wellesley, founded in 1875, are within one hundred miles of one another, yet each has risen to the first rank among colleges for women.

Henry F. Durant founded Wellesley as "a college for the glory of God by the education and culture of women." The first experience of Wellesley coincides with that of Vassar—young women were poorly fitted to do the work offered them, and therefore fitting classes were a necessity and a preparatory department was added. This lasted for five years, but since 1880 only collegiate courses have been offered. The course is very complete and covers four years, including four modern languages, Greek, Latin, science and history, embracing an extended course in political and social science and constitutional history, botany, physics, and mathematics, and a study of the Bible. After the freshman year opportunity for specialization is afforded by elective work throughout the remainder of the course, music, drawing, and painting being offered as extra studies. The course of study has changed but little since the preparatory department was dropped.

The equipment of Bryn Mawr, especially along scientific lines is unexcelled. No preparatory department has ever been maintained, but a larger number of students are pursuing advanced work there than in all the other separate colleges for women of the first rank taken together.

The great advance in the higher education of women made during the last half century could scarcely be overlooked by the older colleges for men. Throughout the west they have accommodated themselves to the movement by opening their doors fully to both sexes and becoming generally co-educational. This plan had some followers in the east and south, yet there conservatism in educational matters is strong and in several of the older universities a compromise was made by the establishment of affiliated colleges for women. They are under the same board of control as those for men and usually have the same faculties, but the women are instructed separately. Five of such women's departments are in operation; among them, Barnard College connected with Columbia and Radcliffe College affiliated with Harvard.

Co-education in higher institutions of learning is a western product and is there very generally practiced. Oberlin, founded in 1833, has the credit for being the first fully co-educational institution of college rank in the world. It was twenty years before another followed its *example* and this time also within the same state. Antioch College, at Yellow Springs, O., was opened in 1853 under the presidency of the renowned educator, Horace Mann. One of his aims was to make its advantages, whatever they were, equally open to both sexes. No one has ever questioned co-education at Antioch, for whether from the point of view of intellectual capacity, or physical endurance, or moral purity it affirms the wisdom of the experiment in co-education.

A new and valuable feature added to the college courses for women in some colleges is the domestic science course.

In the early days besides the ordinary domestic occupations were the making of butter and cheese, spinning and weaving of woolen cloth, and the cutting and making of homespun garments for the family, and every girl was trained to these tasks. Apart from its usefulness the educational value of this training was unquestionable, but with the increase of inventions and machinery these tasks have passed away. This has given women more leisure, but they have lost some of the valuable domestic training and therefore, the domestic science is a valuable addition.

The subject of household economics is by no means narrow. When we consider that the subject may well embrace not only questions relating to food, its selection and preparation, analysis and dangers, but also clothing, health, and the economical aspect of the household, the architecture, equipment and art of the house, the sanitation and ventilation of the rooms, and finally the ethics of our individual lives, we may surely find a full course of study. Such a course may include the general subjects of physics, chemistry, biology, bacteriology, physiology and hygiene, art, architecture, and economics considered with reference to the subjects of cooking, marketing, sewing, food analysis and dietetics.

The higher education of women should not become specialized household economics, but there should also be room enough for culture studies, for languages, history, philosophy, and mathematics. The scope of woman's education should be broad, but there should be the differentiation in respect to the future uses of the education that we find in our men's colleges, and her education is not completed until she has attained a completely fashioned will, which will know how to control and direct her in life, and the mental power to judge and care for herself in every way.

Our American girls will not blindly obey what seems to them arbitrary rules. They can be ruled only by winning their conviction; in other words they will rule themselves, and therefore they should be so educated that they do this wisely.

BOB BENNETT.

Lansing, Mich., June 21st, 1905.

ALUMNI AT COMMENCEMENT.

Prof. C. L. Bemis, '74, Ionia
Prof. J. R. McColl, '90, Purdue University
Prof. J. W. Rittenger, '94, and wife, South Bend, Ind
L. H. Van Wormer, '95, Lansing
R. L. Clute, '96, Philippine Islands
A. T. Swift, '99, Saginaw
Mr. and Mrs. Ranney, '00–'99, Belding
S. L. Christianson, with '00, Scottdale, Pa.
H. B. Gunnison, '00, Detroit
Celia Harrison, '01, West Superior
L. B. Littell '01, and wife
Gertrude Van Loo, '02, Zeeland
Lyman Carrier, '02
Hannah Bach, sp '02-'03, Sebewaing
Blanch Covell, sp '02-'03, Whitehall
C. B. Rose, '02, Detroit.
E. R. Bennett, '02, Conn. Agr'l College
Irving Gingrich, '02, South Bend, Ind.
N. B. Horton, '02, Fruit Ridge
Bessie Buskirk, '03, Wayland
Ora Luther, sp '03-'04, Coopersville
B. T. Hesse, '03, Napoleon
F. H. Sanford, '03, St. Charles
Gertrude Slaght, '04, Davison
Katherine Slaght, '04, Davison
Jewel Lee, '04, Laingsburg
Elizabeth Johns, '04, Wixom
Robert Baldwin, '04, Brown City
G. V. Howard, '04, Wyandotte.
A. A. Rosenberry, '04, Los Angeles, Cal.
Paul B. Pierce, '04, Ann Arbor.
Clark Brody, '04, Fabius.
W. S. Merick, '04, Kalamazoo.
M. W. Tabor, '04, Manistee.
Jessie Palmer, '04, Kalkaska.
Dora Skeels, with '04, Harrietta.
Dorr Skeels, with '04, Ann Arbor.
Helena Laurence, sp. '03-'04, Hudson.
Cara Farmer, sp. '03-'04, Grand Blanc.
H. T. French, with '06, of Purdue.

Little Katherine Hedrick, who was operated upon last Tuesday for appendicitis, is doing as well as could be expected. The operation was of a more serious nature than was anticipated.

With the exception of those who remain at the College to work during the summer, the students have all gone home. Several members of the teaching force have also left and the campus begins to seem quite deserted.

NEW BOOKS IN LIBRARY.

Gulick, Physical Education by Muscular Exercise.
Ice Cream and Cakes.
Johnson, Differential Calculus.
Jessup, Book of the Short Story.
Johnston, History of the Library of Congress.
Jordan, Foot-notes to Evolution.
Johnston, To Have and to Hold.
Landolt, Optical Activity and Chemical Composition.
Leavitt, Facts About Peat.
Leffmann, Structural Formulæ.
Lassar-Cohn, Chemistry in Daily Life.
Lassar-Cohn, Applications of General Chemical Reactions to Investigations in Organic Chemistry.
Lamb, Infinitisimal calculus.
London, The Sea wolf.
London, Call of the Wild.
Leob, Studies in General Physiology. 2 vols.
Langton, How to Know Oriental Rugs.
Laurie, Pre-christian Education.
Laurie, Studies in the History of Educational Opinion from the Renaissance.
Moisson, Electric furnace.

ABOUT THE CAMPUS.

The photograph taken of the Alpha Zeta fraternity is exceptionally good.

Out of nearly 50 sophomores taking ecology not one received a D or an F.

Instructor Holbrook will attend the summer school at the University where he will take work in electrical engineering.

Mr. Floyd Robison was at his old home in Milan last week where he took part in the high school commencement exercises.

Quite a delegation from the Blind School held a picnic on the Campus recently. In spite of their affliction they seemed a merry crowd.

Capt. Burk just missed winning the batting medal this year by one hit. McKenna winning out. Last year he was defeated by Canfield by one hit.

Among the graduates of the University of Michigan in civil engineering are found the names of A. J. Decker and R. L. Bigelow, formerly with the class of '02.

The Horticultural Club at its last meeting elected the following officers for the fall term of 1905: M. J. Dorsey, president; R. L. Pennell, vice-president; D. H. Ellis, secretary.

Prof. Frank Smith, professor of zoology in the Illinois Agricultural College, was a College visitor one or two days the past week. Instructor Myers was at one time a student under Prof. Smith.

On Thursday of last week Dr. Beal and Profs. Barrows and Dandeno met with others at the office of the state geologist to discuss plans of natural history work in Michigan, a small appropriation for which was recently made by the legislature.

Prof. Shaw left Saturday morning, June 17, for Portland, Oregon, and other points in the west. He will visit several agricultural colleges on his trip and spend a few days with his family in Portland. He expects to return the first week in July.

In all branches the work in athletics has been very successful and although the ball game was lost, we did exceedingly well to win second place, considering the fact that we have many new men. Prospects are very bright for another year.

The Industrial School Choir, under the direction of Mr. Burgess, spent a day on the campus recently They ate their luncheon under the shade of the trees, played games on the drill ground west of the armory, and finally were allowed to test the swimming pool in the bath house, which they seemed to enjoy immensely.

Prof. S. A. Beach, of Geneva, N. Y., spent two or three days with Prof. U. P. Hedrick recently. Prof. Beach has been elected to the position of professor of horticulture and forestry at Ames, Iowa, and spent some time here looking over the agricultural course and especially that part of the work relating to horticulture.

The curiosity strip in charge of Instructor McWety contains many interesting things. Among the grains represented are macaroni wheat, einkorn, emmer, speltz, and three kinds of barley. The plat contains specimen plants of all the various legumes, vetches and clovers and it is proving quite interesting to note the growth each is making, as all were planted on the same date.

The State Firemen's Association held its annual meeting in Lansing during the week ending June 17, and on Thursday visited the College in a body, headed by the Clare band. As they were obliged to catch an early evening train, their visit was a hurried one, and they were able to see only a very small part of the equipment of the College.

Mrs. Clarence Smith (Lottie Lee Smith, '97–'98), of Washington, D. C., was a College visitor last week. Mrs. Smith and family will spend the summer with her parents, Judge and Mrs. Q. A. Smith, of Lansing. Her husband, Clarence B. Smith, graduated in '94, and received the degree of M. S. the following year. Mr. Smith is horticultural editor in the office of the experiment station record, Department of Agriculture.

Miss Dori Moxness, who for the past year has held the position of assistant chemist of the experiment station, has returned to her home in Norway. After leaving M. A. C., she spent some time with her brother in Boston, and sailed on Wednesday, June 7, by the Scandinavian American line on the steamer, Oscar, the Second. The steamer sailed direct from New York to Christiana in the north of Norway, which takes about ten days. The many College friends of Miss Moxness wish her a pleasant voyage and trust that she has now reached her old home in Trondgem, Norway, safely.

The annual night shirt parade occurred on Thursday evening, June 15, and the usual program was carried out. Bills were gotten out before-hand announcing the speakers and subjects so that each might prepare his speech. The crowd was drummed together at Williams and Abbot Halls, from which places they proceeded to the greenhouse, to the Women's Building and thence west on Faculty Row, where each resident was aroused by the officers in charge and introduced to the crowd. Dean Gilchrist was unable to appear and after due explanation by Mrs. Haner, the young ladies of the building sang "Home, Sweet Home." Prof. Taft, Instructor Blair and Prof. Vedder were away from home. Prof. King was unwilling to speak unless he could hear the old familiar yell. After her father's response, little Helen Weil favored the crowd with a recitation which was duly appreciated. Red fire was burned at each stopping place and fireworks and balloon ascensions were made a prominent part of the program.

On returning to the hall the usual reception by the Sophomores was tendered, which closed the program for the parade of 1905.

C. P. Bush, '83, was among the alumni here for commencement.

Walter Stanton, '05, will spend the summer working in the botanic garden.

Strawberry picking on the Hort. began June 14. June 15, 44 quarts were picked.

Mr. S. B. Snyder and family are visiting the former's brother, President Snyder.

Mrs. G. A. Lambert, of Niles, spent several days with her son, J. R. Lambert, the past week.

E. Meyer, '09, of Detroit, was called home the past week on account of the serious illness of his father.

G. J. Koch, Geo. A. Brown and Harry Brown have been employed by the agricultural department for the summer.

The seniors, under the patronage of Prof. and Mrs. Sawyer, spent a delightful day at Grand Ledge Saturday, June 17.

Instructor Curtis was at Ann Arbor for commencement, his sister being a member of the present graduating class.

Mr. and Mrs. Loew returned from Allegan county, Thursday, where they attended the funeral of Mr. Loew's father June 21.

Prof. J. R. McCall, '90, professor of steam engineering at Purdue University, spent several days with College friends recently.

The Hort. department has made arrangements for the summer supply of ice to be drawn from the city. The price will be $6 per ton.

Two members of the graduating class are children of alumni. Miss Bemis is a daughter of Prof. C. L. Bemis '74, of Ionia, and Miss Benton, a daughter of Frank Benton '79, of Washington, D. C.

Ralph Graham, '06m, has been elected captain of the track team for the coming year. Mr. Graham has been on the track team for two years and on the relay team for the same length of time.

Prof. and Mrs. W. B. Barrows left Tuesday, June 20, for Cambridge, where they will be present at the graduation exercises of their son, W. Morton Barrows '03, from the Lawrence Scientific School of Harvard University on June 28. They will return about July 1st.

Two interesting bulletins by Prof. L. B. Judson, '03, of the University of Idaho, have recently been received. They are bulletins 43 and 47, and treat on "Planting the Apple Orchard" and "Pruning the Apple Orchard." Both contain many illustrations of the subjects discussed and are well worth careful reading by those interested.

Mr. Robert Kendall, for the past two years foreman on the experiment station, has been obliged on account of throat trouble to give up his position and seek a different climate. He has secured a position at Pueblo, Colo., in connection with a private hospital in charge of Dr. Hubert Work. He will superintend the work of the farm, orchards and lawn, and also the care of live stock. During his stay Mr. Kendall has proven himself the right man in the right place and his friends at M. A. C. trust that he may speedily recover and some time return to Michigan.

Following is a partial list of books added to the library since our last notice in November:

Ames, Theory of Physics.
Appleton, Lessons in Chemical Philosophy.
Abbott, Electric Transmission of Energy. (New edition).
Adams, Dialect Ballads.
" Leedle Yawcob Strauss.
Abbott, Christianity and Social Problems.
Allen, The Mettle of the Pasture.
Baldwin, American Short Stories.
Blyth, Foods; Their Composition and Analysis. (New edition).
Bell, Power Distribution for Electric Railroads.
Buel, Reinforced Concrete.
Bigelow, How Nature Study Should be Taught.
Cajori, History of Physics.
Chase and French, Haes Wael; Book of Toasts.
Considere, Experimental Researches in Reinforced Concrete.
Cunningham, Dock Engineering.
Campbell, A Revolution in the Science of Cosmology.
Chapin, Theory and Practice of Infant Feeding.
Coulter, Plant Relations.
Dexter, History of Education in the United States.
DeVries, Species and Varieties.
Dingee, Science of Successful Threshing.
Doyle, Hound of the Baskerville.
" Sherlock Holmes.
Dunbar, Economic Essays.
Falk, Cements, Mortars, and Concretes.
Farrington and Woll, Testing Milk and Its Products. (Last edition).
Gotshall, Notes on Railway Economics.
Goodrich, First Book of Farming.
Gibson, Calculus.
Hering, Conversion Factors.
Hutchinson, Food and the Principles of Dietetics.
Hillis, Quest of John Chapman.
Hunt, Cereals in America.
Houstan, Dictionary of Electrical Words, Terms and Phrases.
Gray, Absolute Measurements in Electricity and Magnetism. 3 parts.
Groom, Elementary Botany.

CASH ACCOUNT STATEMENT OF THE M. A. C. BOOK-BUYING ASS'N, 1905.

RECEIPTS.

Cash bal. on hand Sept. 21, 1904.	$853 07
Merchandise sold	14,377 20
Membership tickets	252 75
Discounts	65 25
	$15,548 27

EXPENDITURES.

For merchandise	$13,876 23
Business expenses	875 45
Dividends declared	525 54
Cash on hand	271 05
	$15,548 27

MERCHANDISE ACCOUNT STATEMENT.

DR.

Inventory on hand Sept. 21, 1904.	$1,379 50
Merchandise purchased	13,876 23
Excess over cost	1,214 32
	$16,470 05

CR.

Merchandise sold	$14,377 20
Inventory, June 21, 1905	2,092 85
	$16,470 05

COMPARATIVE SUMMARY.

1903-04.	
Merchandise sold	$9,375 79
Business expenses	813 19
Inventory, June, 1904	1,379 25
Membership tickets	233 00
1904-05.	
Merchandise sold	$14,876 23
Business expenses	875 45
Inventory, June, 1905	2,099 85
Membership tickets 340	252 75

Miss Blunt, formerly assistant professor of English at M. A. C., and her mother spent Sunday, the 18th, at the College, as guests of Mrs. Landon.

Mr. A. A. Pattullo, who took the special course in live stock husbandry last winter, is to be married on July 28 to Miss Isabel McVittie at Deckerville, Mich.