PUBLIC DOCUMENTS OF MAINE:

BEING THE

ANNUAL REPORTS

OF THE VARIOUS

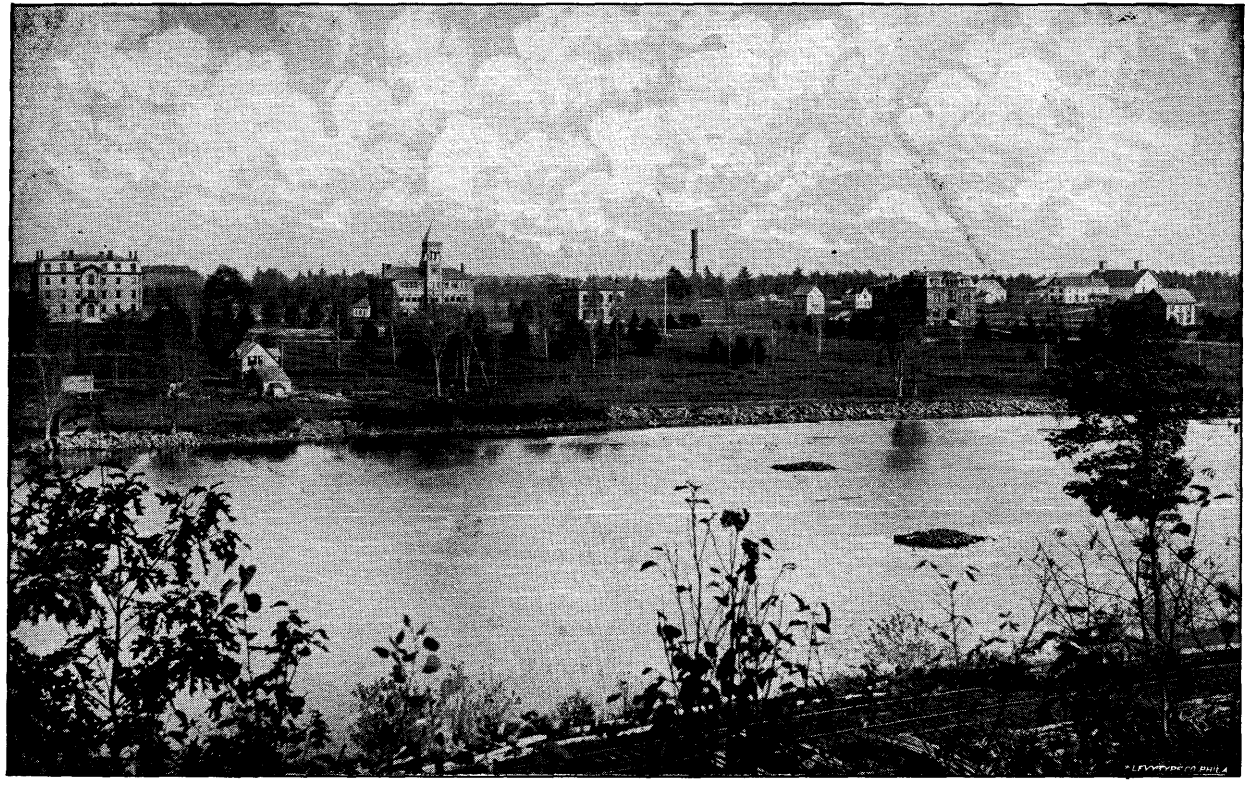
Public Officers and Institutions

FOR THE YEAR

1894.

VOLUME II.

AUGUSTA:
BURLEIGH & FLYNT, PRINTERS TO THE STATE.
1894.



PRINCIPAL BUILDINGS.

OAK HALL. WINGATE HALL. CHEMICAL LABORATORY. COBURN HALL.

ANNUAL REPORT

OF THE

MAINE STATE COLLEGE

FOR THE

YEAR 1893.

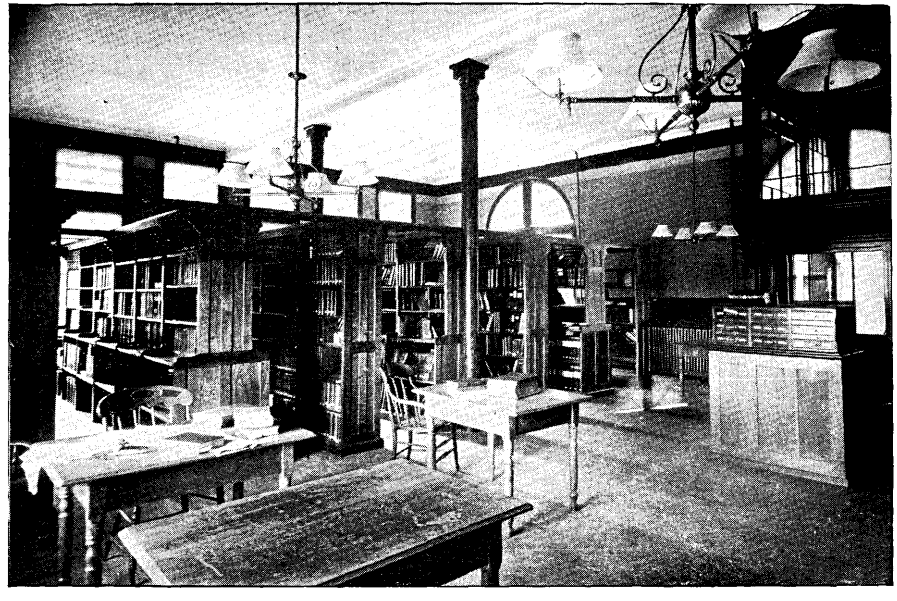
PART I.

PART I–Reports of Trustees, President and Treasurer.

PART II–Report of the Director of the Agricultural Experiment Station.

AUGUSTA:
BURLEIGH & FLYNT, PRINTERS TO THE STATE.
1894.

CONTENTS OF PART I.



LIBRARY.

REPORT OF TRUSTEES.

To the Honorable Governor and Executive Council of Maine:

The Trustees of the Maine State College of Agriculture and Mechanic Arts, respectfully submit their twenty-fifth annual report, with the reports of the President and Treasurer. The past year has been one of prosperity with the college. There have been no changes in the Board of Trustees, and but one in the faculty—a very important one, a change of presidents. Upon September 1st, President Fernald severed his connection with the college, after a continuous service of nearly twenty-five years. Commencing his duties with its foundation, he devoted his time and ability for a quarter of a century to the upbuilding, developing and maintaining of this institution. To him, more than to any other person, are its present success and high position due. Its many graduates gratefully recall his efforts in behalf of the college and its students, in the years that are gone; and testify, whenever opportunity offers, their respect and love for him who, for so many years, was the head of their beloved alma mater. For more than a year after President Fernald, because of impaired health, had placed his resignation in the hands of the Trustees, they were in constant search for a man possessing the character, ability, and other necessary qualifications to fill his place. More than a score of candidates were considered, and finally the choice of the Trustees fell upon Prof. A. W. Harris of Washington, D. C., then at the head of the Office of Experiment Stations in the Department of Agriculture. Just in the prime of life, with the strongest endorsements, and apparently possessing every qualification required, he was selected. A ripe scholar, having received the advantages of American and European institutions of learning; and for years connected with the Department of Agriculture of the National Government, holding an official position, the duties of which brought him in contact with the work of all the

State colleges of the nation, he seemed by training and experience to have a peculiar fitness for the presidency of the college. He assumed charge at the commencement of the fall term and received, as was to be expected, the hearty coöperation and assistance of President Fernald and all of the college faculty; and under his direction the affairs of the institution appear to be progressing favorably, and with every indication that the new President will in no way disappoint the high expectations of his friends and the Trustees. His elaborate report, herewith appended, with its suggestions and recommendations, should be read with care by the people of the State, and especially by those who are interested in the present and future welfare of the college. Some of the recommendations made by him, have been made in the past, by President Fernald and by the Trustees. Their importance is emphasized by the endorsement of President Harris, who has been quick to perceive the needs of the institution, and the weak places that need strengthening. His recommendations are all worthy of careful consideration. The appropriations made by the last legislature have been prudently expended. The improvements to the campus are extensive and noticeable. The President's house, which was seriously damaged by fire since the last report was submitted, has been remodelled and improved, both as regards architecture and its conveniences. A safe and satisfactory embankment in rear of the target range has been built within the sum appropriated for that purpose. The want of a drill hall and gymnasium is as great to-day as in the past, and the neglect on the part of the State to fulfill the spirit of the national law under which the college was established, is again referred to by the Trustees, with the hope that the next legislature may in their wisdom appropriate sufficient money for the erection of a building that shall enable the students to perform their drill in the winter, as by law required, as well as in the summer, and that such building shall be constructed in a manner to constitute a proper gymnasium. The condition of the dormitory is such that quite extensive repairs will soon have to be made; and the question will then have to be decided as to whether it will be wiser to simply repair the building, or to remodel it, and thereby make it more convenient and better adapted for the purposes for which it will be used.

The number of students in attendance the past year has been greater than that of former years, and would doubtless have been considerably larger but for the severe business depression. All

indications point to an increase of numbers the coming year. The work of the college is worthy of much commendation. Its faculty are conscientious, faithful and able. The institution, it is believed, is growing in favor with the people of the State, and the Trustees are very hopeful regarding its immediate future. Every year it is better fitted to perform its work. It is believed students can here acquire a liberal, practical education, for a smaller expenditure of money than in any other educational institution of its standing and character within the limits of New England. The training it gives insures remunerative employment to a majority of its graduates, while all are better fitted to meet life's duties successfully. May the young men and young women of the State who shall avail themselves of its advantages, constantly increase in numbers. May its friends multiply, and the State and nation continue to make generous provision for its maintenance. Then shall it become, as the years go by, the grand institution its founders intended, a College of Agriculture and Mechanic Arts, whose graduates shall be a credit to the State and a power for good, wherever their lot in life shall be cast.

HENRY LORD,
President Board of Trustees.

REPORT OF THE PRESIDENT.

To the Board of Trustees of the Maine State College:

GENTLEMEN:—I have the honor to submit my annual report to the Trustees of the Maine State College, for the year ending December 31, 1893.

From January 1, 1893, until August 31, 1893, the College was under the charge of President Merritt C. Fernald. September 1, I assumed the office of President in accordance with the election of your Board. It gives me great pleasure to bear testimony to the admirable condition in which I found the institution at that time. I wish to express my appreciation of the courtesy shown me by the members of the faculty and the retiring president, and to acknowledge my especial indebtedness to him for the care with which he arranged numberless details, so as to cause me the least embarrassment at the beginning of my administration.

I was well received by the body of students, and greatly gratified to find in them so gentlemanly and earnest a body of young men.

THE CONDITION OF THE COLLEGE BUILDINGS.

In most cases, the College buildings are in excellent condition. The repairs on the President's house have been completed, and seem to be thoroughly satisfactory. The Chemical Laboratory will need some changes in the heating apparatus, which is insufficient to warm the building properly. During the present winter it has been necessary to place stoves in two rooms. It is imperatively necessary to clear out the cellar of this building and cement the floor. It now has a common dirt floor, which is damp both in winter and summer, making the cellar nearly useless and rendering the whole building unwholesome. The Dormitory has been in use for twenty-three years. It is still a strong building, but shows marks

of wear, and will call for extensive repairs soon. The floors are bad, the walls are broken, and the ceilings need continual patching. In plan, the building is unsatisfactory, and it is highly desirable to remodel the interior. The long halls should be taken out, and the space saved, after providing for stairways, used for alcoves and bed rooms, the plastering done over in the most durable manner, provision made for better ventilation, perhaps by means of fireplaces in the rooms, and the cellar cemented. The most imperative need is for new waterclosets of approved form.

The house used by the Beta Theta Pi Society needs a bath room. The boarding house should have new cooking machinery. The present appliances are anything but modern, and to do the best work it is highly desirable that they should be replaced by proper ranges and ovens. In an institution where so much time and attention are given to the study of the proper feeding of plants and animals, the feeding of students should receive the greatest care and the most scientific study.

THE FINANCES.

Upon assuming office, I found that the College had been anticipating its income, and that a portion of the money which should have been available for expenditure during the present college year had already been spent or provided for. This has made it necessary to observe the most rigid economy. The necessity for such a course has been very unfortunate in some cases, but I am persuaded that nothing is so unwise as to allow the expenses of the College for any time to exceed its income for the same time. To do so is to require future contraction instead of a healthy and wholesome growth.

The College formerly kept four sets of accounts, those of the treasurer's office, those of the boarding house, those of the farm, and those of the horticultural department. The inconvenience and disadvantage of such a system are evident, and I have now brought all accounts to the treasurer's office and his books will show in detail all the receipts and expenses of the College whatsoever.

THE EXAMINING COMMITTEE.

I suggest that I be authorized to request suitable persons, citizens of the State, to act as an Examining Committee, to visit the College at the time of the spring examinations shortly preceding

the Commencement, to prepare a written report to your body in regard to the College, its courses, its buildings, its facilities, its teachers, its students, and any other matters that they think best to call to your attention.

THE COMMENCEMENT.

At the Commencement in June, 1893, degrees were conferred upon the following persons.

BACHELOR'S DEGREE.

Hosea Ballou Buck, Stillwater; Walter Wilson Crosby, Bangor; Charles Frederick French, Glenburn; Charles Henry Gannett, Augusta; George Weymouth Hutchinson, Orono; Walter Dows Jack, Topsham; Charles Prentiss Kittredge, Milo; Hugh McLellan Lewis, South Berwick; Charles Clark Murphy, Hampden; George Freeman Rowe, Bangor; Orrin John Shaw, Hampden; Harry Maubec Smith, Bangor; John Milton Webster, Augusta; Hiram Williams, Portland; George Ansel Whitney, Madison.

MASTER'S DEGREE.

Francis Stephen Brick, Bernardston, Mass.; Frank Edwin Emery, Raleigh, North Carolina; Chandler Cushman Harvey, Fort Fairfield; Arthur Dean Page, St. Cloud, Minn.; Frank Adelbert Smith, St Cloud, Minn; Winfield Scott Webb, Gallitzin, Penn.; Nathaniel Estes Wilson, Reno, Nevada.

WORLD'S FAIR EXHIBIT.

The College made an exhibit in the Liberal Arts Building at the Columbian Exposition, and the Station made an exhibit with other Stations, under the auspices of the United States Department of Agriculture in the Agricultural Building. For these exhibits the institution received the highest commendation.

THE GOVERNMENT OF THE COLLEGE.

The College is maintained at public expense for the public good. Those who participate in its benefits should therefore be required to fulfill faithfully their obligations as loyal members of the institution, of the community and of the commonwealth. All students owe to the public for its expenditure in their behalf an equivalent in the form of superior usefulness and prompt performance of their

duties. As members of the community they are amenable to the law. The College recognizes its relation to the commonwealth as a State institution and a part of the State government, and will in no case shield students from the consequences of any acts in violation of the State laws. This attitude is expressly recognized and commanded by an act of the Legislature of the State which requires that in the case of offences against the public order students, like other persons, shall be responsible for their deeds to the officers of the law. It is my purpose loyally and faithfully to obey this command of the State, and not only to refrain from placing any obstacles in the way of the execution of the law, but, on the contrary, to do everything in my power to assist in its administra ion.

The Order of the Year.—During the year there has been but one serious conflict between the students and the College law. It is but due to our students that I should here state that my experience embracing many colleges has never brought me into acquaintance with a body of students more orderly and amenable to proper regulations; and lest the following account may give a false impression, I wish to state expressly that the practice of hazing is almost entirely banished from this institution, and I believe that no institution in the State or in New England is more free from serious and malicious offences on the part of some students against the rights of others.

The disturbance above referred to occurred in the fall term. Some members of the Sophomore class engaged in an attempt to frighten one of the Freshmen, who had made himself unpopular with them. They did him no bodily harm, and so far as I was able to determine, had no intention of so doing.

The names of two of the Sophomores engaged in this attempt became known to the Faculty. Although there was not proof which would have been taken against them in a court of law, the facts were not disputed, and they readily acknowledged their part in the offence After investigation, these two students were suspended. Before this action was taken, a committee of the Sophomore class called upon me and stated that the whole class were guilty, either by act or by sympathy, and that they thought it but right that they should bear the same punishment as the two young men who were known to us. No member of the class, however, made an individual confession.

When the suspension of the two students was announced, the members of the Sophomore class absented themselves from recitations, notwithstanding the fact that the committee had expressed to me its opinion that "something should be done," and notwithstanding the fact that these two men had voluntarily stated that they thought themselves not unjustly treated.

I was presented with a paper signed by every member of the class with the exception of the two students suspended, stating that they had voluntarily taken upon themselves the suspension which the Faculty had imposed upon their classmates. The matter was referred to the Faculty, and I was instructed to explain to the Sophomores that they had no right to suspend themselves, but that in the opinion of the Faculty, they were "absent from college duties without excuse." I was also directed to order the members of the class to return to their work upon the next day, and to state that those who were of age and failed to do so, would be expelled; that others who failed to do so must immediately return to their homes to consult with their parents and return to college work within a week, and that those who did not obey the directions would be expelled.

Two members of the class went home, but returned within the week. All others resumed their college work the following day.

College Regulations.—The Faculty has adopted new regulations for the government of the College in regard to the selection of studies standings and grades, absences from recitations and examinations, rhetorical exercises, entrance conditions, leave of absence, attendance upon church and chapel, penalties, examinations and athletics. These regulations are printed in full in the appendix to this report.

By these regulations, the quota of regular studies for each student is made to be such as to require, for a minimum, seventeen hours and, for a maximum, twenty hours of class room work each week. In the application of this rule, two hours of laboratory work and of other exercises not requiring preparation, count as one.

Most colleges in New England require from fourteen to seventeen hours of class room work a week, with a much smaller proportion of exercises to be estimated at one-half. Our requirements are therefore much more severe than those of most other collegiate institutions.

The character of the work of members of the Sophomore and Freshman classes will be announced by numerical standings on a scale of one hundred. But only the general character of the work of members of the Senior and Junior classes will be reported by assigning each student to one of four grades.

Excuses for absence from individual exercises will not be required. Each student will be expected to pursue his work in a manly way, absenting himself from college exercises only when he has sufficient reasons for doing so. Of these reasons he is to be the judge, but if a student shall absent himself from ten per cent or more of the exercises in any study, he will not be admitted to the final examination. A student who fails to pass at any examination, is absent or is excluded from any examination will have two opportunities to take special examinations, one immediately before the beginning of each of the next two succeeding terms. If he be absent without sufficient reason from both these special examinations, or fail to pass at one or the other, he will be required to recite with the next class. Students are required to attend church and chapel, but as an experiment the Faculty have announced to the Senior class that no requirement will be put upon them in regard to church attendance.

ADMISSION TO THE COLLEGE.

Entrance Requirements.—The Faculty, at my suggestion, recommend for your action that the entrance requirements, for the next class be increased by the addition of physiology, and that those for the next succeeding class be further increased by the addition of elementary botany.

The demands upon the institution are constantly increasing. Almost every year sees important developments in the various sciences which make up a great part of our work, and our time is already overcrowded. Our students have been, I found, required to spend each week twenty-eight hours in the class room, counting two hours in laboratory work, shop work and other studies not requiring previous preparation as one. The pace was killing; many of the students dropped out of college, many were forced from the regular courses into special courses, and others accomplished their work either unsatisfactorily or at serious risk to their health. Another disadvantage grew out of the fact that the evils of this overwork fell upon certain studies with disproportionate weight.

Those departments whose work was largely in the laboratory did not suffer, but those departments which require thought and preparation out of the class room and are especially valuable for the general culture, training and development which they give, suffered most seriously.

It therefore seemed absolutely necessary to decrease the hours of class room work required from the students.

But even now our course calls for a much larger amount of work than is required in other colleges, while, on the other hand, our entrance requirements are less than those of classical institutions. It seems best, therefore, to require as a part of the entrance conditions some of the elementary sciences, both in order to insure the proper development of the student before beginning his college course, and to relieve our curriculum by the studies required.

I cannot refrain from calling your attention to one serious defect in the preparation of many of the students who come to us. I do this in the hope that a knowledge of the trouble may come to the teachers of the State. For the engineering courses which form a large part of our work, a thorough preparation in mathematics is essential. It has been the tendency in most colleges to reduce the requirements in mathematics, but in institutions like ours it has been necessary to increase them, as the engineering professions developed more and more difficult problems. In most of the classical colleges of the country, the required mathematics of the college course is less than half the mathematics required from our students. It is evident, then, how important it is that students come well prepared in this study. So much must be accomplished in the time given to our courses, that we can not devote any college time to the improvement of the elementary mathematics, but must begin with the advanced mathematics, on the assumption that the preparatory work has been well done. Unfortunately this is very often not the case. The schools might improve their courses by decreasing the amount of required arithemtic, omitting the puzzles, and the more advanced problems which should be solved by algebraic methods, and increasing the time given to algebra and geometry. The study of algebra should be commenced early in the school course and should comprise at the first only the simplest operations and problems, and then gradually advancing in difficulty accustom the student to the use of algebraic methods for the solution of the more difficult problems of arithmetic, and make him so familiar

with the fundamental principles of algebra that he may be able to use them as readily as the fundamental methods of arithmetic. As its work develops it will be necessary for the College to insist more and more rigidly upon the proper preparation of students in mathematics.

Certificates of Fitness.—The College has been accustomed to accept in the place of entrance examination certificates of fitness from schools which seemed to be qualified to do good preparatory work. The Faculty have thought it wise to adopt regulations in regard to such certificates. Application for the admission of any person on certificate, shall be made by the principal of the school at which he prepared. The school will then be examined by a member of the Faculty, and if the course and work justify such action, the school will be placed upon a list of approved schools from which certificates will be received. This list will be published in the catalogue with the names of the principals. The College will furnish blanks for the certificates. These will call for a statement of the text books used in each study, the methods of instruction employed and the character of the work done by the student.

Distribution of Herbariums.—In view of the proposed requirement of botany as an entrance condition the professor of botany will distribute to the more important academies and high schools of the State which care for them, herbariums prepared by students of the College, as an illustration of the kind and character of the work that we desire done.

FACULTY AND DEPARTMENTS.

The Faculty.—The faculty remains as last year. The work of the departments has been generally without incidents calling for special mention. It is gratifying to note that during the fall term two members of the faculty declined very flattering calls to other institutions. The names of the members of the faculty and much information in regard to the departments will be found in the catalogue which forms part of the appendix to this report. The catalogue has received very thorough revision, and it is hoped that it will present a fair statement of the facilities and work of the institution.

Leave of Absence—Prof. Hart of the Department of Mathematics has requested leave of absence for one year, beginning with July

1 next. It is his purpose to spend the year in study which will be useful to his College work. This request has my cordial endorsement.

The Experiment Station —The report of the Director of the Experiment Station is submitted as the second part of this report. The work of this department of the College I wish to commend in the strongest terms. It commands respect for its scientific care and accuracy, and for its energy and usefulness. Its work constitutes the most extensive and most careful piece of original scientific investigation ever made in this State. The people of Maine have reason to be thoroughly gratified by the high rank which the Station has taken by its investigations in the sciences which underlie agriculture. No work is more difficult than that of the agricultural experiment stations; none requires a more painstaking and conscientious devotion to details; none requires a wider scientific preparation.

The Boarding House.—The College boarding house has been for the year, as formerly, in the charge of Mr. Aaron E. Spencer. Students are at liberty to board elsewhere, but the number of boarders at the Commons has averaged 84.

The charge for board for the spring term was $3 00 per week, for the fall term $3 00 per week. This was the actual cost to the College, exclusive of rent and repairs for which no charge is made.

ADDITIONS TO EQUIPMENT.

The forcing house for the agricultural and horticultural departments of the experiment station is now nearing completion.

The improvement of the campus for which provision was made by the last Legislature has been completed as far as the money appropriated will allow. Any one who was acquainted with the campus as it was a few years ago will be surprised to find that so great a change has been accomplished with the expenditure of the amount of money allowed.

The department of physics has added to its equipment a dynamo and circuits for the illustration of the applications of electricity to the problems of lighting.

The facilities of the chemical department have been increased by a room fitted up in the basement for assay work.

The increase in the number of students in the department of mechanic arts has made it necessary to place several new forges in the foundry.

The College has purchased a good lantern for the use of the various College departments. It will be of great service in the extension and other lecture courses which may be given by members of the Faculty.

Other minor purchases of apparatus, materials and books will add materially to the usefulness of the College but are too numerous to be mentioned here.

THE COURSES OF STUDY.

Electrical Engineering.—In response to an evident demand for instruction in electrical engineering, I recommend that your Board make provision for such a course as soon as practicable. No such instruction is given in the State, and none in neighboring States, except at institutions in which the expenses are very much higher than here.

The experience of other colleges shows that the electrical engineering course is filling a real want. Such a course, recently established in the Pennsylvania State College, has at its start, more students than any other single course. I am informed that the same is true in the Institute of Technology at Boston, and in other institutions.

Electrical engineering offers at present better opportunities for usefulness and profit in our own and other states than any other mechanical profession.

Electric light works will doubtless soon be extended to all the towns and most of our large villages, and where water power is cheap may even be extended into country districts. The extension of lines of electric cars throughout the State along the more frequented country roads, connecting cities and villages and carrying the products of the farm to market, is, in my opinion, only a matter of time.

Whenever the methods of transmitting power by electricity are sufficiently improved, changes and improvements will be made in the use of our water powers which are fraught with the most important economic and social results. Now, the mill, with the houses of the employes about it, stands on the bank of the river, in low ground. But when it becomes possible to transmit the

power by means of electricity, back to the hills, the mills and the homes of the operatives will be built upon the higher and more wholesome land. This change will also favor the most complete utilization of natural powers. One mill on a river bank often prevents the using of the surplus power by merely blocking up the way to it.

I might go into further details, but what I have said is surely enough to demonstrate two things:--First, that the future prosperity of our State depends in a large manner upon the use we make of electricity, and that the State for her own sake cannot be too early in making provision for the thorough training of her citizens in this line of work; and second, that there are for our young men few, if any, more promising openings than those which would be opened up by the establishment of the course which I recommend.

In this connection I should call your attention to the fact that electrical engineering is only a branch of mechanical engineering, and that the establishment of such a course as a part of our mechanical engineering work would not involve any great expense. The first, second and third years of a course in electrical engineering would be identical with those years as now laid down in the course of mechanical engineering, with the exception that more attention would be given in the Junior year to the study of physics. The fourth year would contain all the technical work and would contain little else.

For this last year we need a practical electrician as instructor and apparatus and fittings, which at my estimate would cost from seven to ten thousand dollars.

A Preparatory Medical Course.—Our present course of chemistry is well arranged for those who propose to become either analytical or manufacturing chemists, and offers a good preparation for those who look forward to courses in pharmacy or medicine.

It is possible, however, by combining chemistry, botany and natural history, to prepare a course still better fitted as a preparation for a medical course, and it is my purpose to lay before your board at its next meeting a plan for such a course.

A Course in Pharmacy.—I recommend that, as soon as the income of the College will allow, we offer a course in pharmacy. This would require the employment of an instructor in practical pharmacy. All the other essentials of the course are now to be found in the departments of chemistry, botany and natural history.

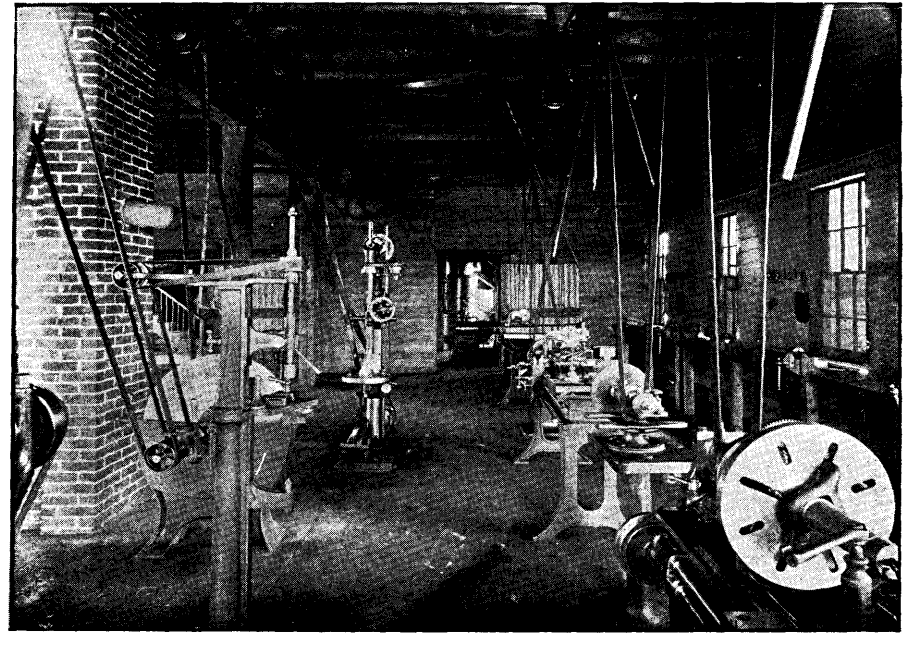
A Course in Library Economy.—The College is now prepared to offer a course in library economy. The librarian is thoroughly qualified to give theoretical and practical instruction in the care and conduct of libraries, and can do this without in any way interfering with the proper performance of her present duties. There must be in the State a considerable number of persons, especially women, who would find in such a course of instruction a welcome introduction to a useful and profitable means of support.

Special Courses.—In my opinion, the State Colleges should not confine their work to the instruction of those young men and women who seek their class rooms, but should endeavor by all proper means to become the sources of knowledge for the communities which they serve. They should strive to be helpful in all reforms and a source of inspiration to those who by study and practice desire to fit themselves more thoroughly for the work of life. It therefore seems wise to admit to special courses in the College any person who may be benefit d by pursuing them, and to establish short courses and extension courses.

Short Courses in Agriculture.—It was in view of these facts that the shorter courses in agriculture were originally prepared. This department now offers, in addition to the full course of four years, which furnishes technical training in the science and practice of agriculture, together with a collegiate training in mathematics, general science, literature, modern languages, philosophy, etc.; a two year course which gives technical instruction in agricultural practice, with some training in the sciences which underlie agriculture; and a one year course, which confines itself to agricultural practice with an exposition of the reasons for it.

In addition to these courses, the College has established a short winter course of twelve weeks, intensely practical and intended for the benefit of farmers, unable to pursue any of the longer courses, but who will be benefited by a logical and consistent presentation of the elements of the agricultural sciences, and by instruction in regard to the newer agricultural machinery. It includes agricultural chemistry, the judging and feeding of domestic animals, the care and use of dairy machinery, veterinary science, agricultural machinery, entomology and business law. In the appendix to this report I include a brief circular issued in regard to it.

The Dairy Course.—The agricultural department offers also a course in dairy management. The College has a good building,



MACHINE ROOM.

thoroughly equipped for dairy instruction with the latest and most approved apparatus. The work in dairying is in charge of Prof. Gowell. This course is intended for those who have extensive dairies or who expect employment as managers or assistants in creameries.

The Short Course in Carpentry.—During the fall term there came to the College from one of the cities of Maine a young carpenter, who had enjoyed the advantages of a good high school, and had rested content for several years without thought of any further course of instruction. When the hard times came, he found it difficult to obtain employment and decided to utilize his time by coming to Orono for a special course in carpentry and drawing. I have no doubt that the knowledge which he has obtained in the one term during which he was here will prove to be many times more valuable to him than the amount which he could have earned, even in the most prosperous times.

This suggested the advisability of establishing a short winter course in carpentry and iron work. With the approval of your Board, I will issue circulars of information during the coming summer and fall announcing a course to include systematic instruction in the use of wood working tools, the ordinary hand tools and the lathe; the care of tools and machinery; instruction in filing, iron work and forging; a brief course in business law, to include the making of contracts, the drawing of specifications, etc.; exercise in the framing of buildings from specifications; instruction in mechanical drawing; the use of simple surveying instruments for the laying out of buildings; explanations of the most useful elementary principles of higher mathematics; and instruction in some one course not closely related to technical work, but intended to awaken and develop the intellectual powers. This may either be in English literature, American history, or political economy. The course will continue like the other short courses twelve weeks. The student will be expected to pay a small fee to cover cost of the material used in the shop.

Extension Courses.—The Faculty have in preparation circulars in regard to the extension courses of the College. These courses consist of home readings, and of lectures to be delivered by members of the Faculty when requested. The circulars and information in regard to the reading courses are entirely free. We have offered in the agri-

cultural department to establish what we have termed local schools, proposing to send at convenient times the professors of the agricultural department in turn to conduct schools of two weeks wherever a class of sufficient size can be established that will bind itself to pay the necessary expenses of maintaining the school.

Public Addresses by the Faculty.—The College Faculty have always been accustomed to deliver during the year many addresses on popular and technical subjects. During the last fall the Faculty has done more work of this sort than usual I think it wise to encourage work of this kind as far as it may be undertaken without interfering with the more serious College duties. During the fall term extending from the first of September to the twenty-first of December, the officers of the College delivered thirty-nine public addresses.

NEEDS OF THE COLLEGE.

Drill Hall and Gymnasium.—Perhaps the greatest need of the College is a drill hall and gymnasium. By the United States law of 1862 providing for the establishment and endowment of this institution, we are required to give instruction in military tactics and drill. This has been admirably well done, and I consider our military department one of the most important. But without a drill hall, military drill must be omitted during the winter months, since it is impracticable to conduct such exercises out of doors except in the early fall and the late spring A proper drill hall could also be used as a gymnasium The possession of a proper gymnasium I consider of unusual importance to us. Our students, largely drawn from the farms of the State, where they have been accustomed to heavy bodily exercise, cannot accommodate themselves to the student life, comparatively quiet, without serious danger of physical disorder. To them, more than to the students reared in the towns and the cities, it is necessary to give systematic physical culture. In the early fall and late spring this is properly taken in the open air, but in the winter it cannot be. If the students were at home their exercise would be less, of course, than in the summer months, but still much more than they can get here unless it be provided for them in a gymnasium.

Dormitory Accommodations —I should call your attention to the fact that the present number of students practically fills the dormi-

tory. At the beginning of the fall term there was a vacancy for one student only. If we wish any considerable increase in the number of students, we must provide further dormitory accommodations. Some help may be gained by the recommended changes in Oak Hall, the dormitory building, but this will be insufficient. It may be necessary to erect a new dormitory, but I am inclined to think it would be better to encourage the societies to build club houses, each to accommodate a number of students. Two societies, the Beta Theta Pi and the Q. T. V. already rent houses from the College, and I understand that they are collecting funds for the erection of houses of their own. I suggest the propriety of granting to these and other societies the privilege of erecting club houses, of style and design to be approved by the College, upon the College campus without rent.

It may be desirable to ask the State to encourage the early erection of such buildings by the grant of a part of the cost. I am confident, that this method of providing for an increase in dormitory accommodations will be both satisfactory and economical.

The Woman's Dormitory.—I should call attention to the fact that although women are admitted to the College, no provision has been made for their residence on the College grounds. Our engineering courses do not attract them. But the courses in general science and in literature are fitted to their needs. The proposed courses in pharmacy and library economy ought to attract many young women. It is evident that women cannot walk back and forth to the village, a mile away, and if they are admitted to the College, provision must be made for them to board and lodge on the College campus.

Heat and Light Plant.—I recommend that a committee of the Board of Trustees be appointed to consider the advisability and practicability of establishing a central steam and electric plant for lighting and heating the buildings.

Houses for the Faculty.—I suggest that your Board take into consideration the possibility of making some arrangement by which members of the Faculty who desire to erect residences upon the College grounds may be allowed to do so, on terms which will be fair to both the College and the professors. At present most of the Faculty reside in the village of Orono, more than a mile from the College grounds. As a result they waste a large amount of time and effort in travel between the College and their homes.

One other bearing of this recommendation is still more important. The College is located in the country, distant from a village which is itself small. While this location has advantages, it has disadvantages. Among the most serious is the fact that our students are largely cut off from social opportunities; especially so since the members of the Faculty who would be glad to open their houses to the students are so far away.

House for the Military Instructor.—The military instructor being detailed to Orono for a comparatively short time will, of course, live in a rented house. In the past he has found very great difficulty in getting suitable accommodations in the village. Since he is in charge of the discipline of the College, it is especially desirable that he should be located upon the College campus. For these reasons I hope it may soon be possible to erect on the campus a house for the military professor.

The Library.—Among the pressing needs of the Collage is an increase of the funds for the purchase of books for the library. The library now contains nine thousand volumes, but for an institution of this character it is entirely insufficient. There is imperative demand for the immediate expenditure of from five to ten thousand dollars in the purchase of books, and not less than twenty-five hundred dollars should be hereafter spent each year for a long series of years for this purpose.

Number of Students.—Among the greatest needs of the institution is more students. I am persuaded that the advantages offered by the institution are not properly appreciated throughout the State, and I shall make it my constant endeavor to acquaint the people more fully with our work.

The facilities are supplied at public expense and there is annually a loss to the State in that many of them are not used to the extent to which they might be. In manufacturing establishments, the greatest profits can be obtained only when the plant is worked to its full capacity. The same is true of a college. A chemical laboratory is necessary to teach chemistry to even one student. But the same laboratory may be used to teach many students with scarcely any increase of expense. Thus, our laboratories, library, museum, shops, might be used by two or three times as many students as we now have, with little additional expense. It is to be hoped, therefore, that all persons interested in educational work of the kind which this institution does, will bring it to the attention

of young men and young women who are qualified to pursue its courses.

A Loan Fund.—Most of our students are poor. It is greatly to the credit of the State that this institution has been so managed that the poorest boy might command its opportunities.

The State owes it to itself to furnish to all its citizens upon terms exactly equal the opportunity to gain not only the best common school education, but the best collegiate education as well. The State furnishes common school education without expense to the pupils. The same is nearly true of this institution, but not quite.

The College offers no scholarships, and makes no gifts of money to poor students. This course I heartily approve. In a State institution rich and poor should be treated alike. The State should grant no assistance to poor students which would give the least suggestion of charity. But I recommend that your Board consider the advisability of estabishing a loan fund, from which a considerable portion of the expenses of a course may be loaned to needy students on a strictly business basis, requiring from the borrowers ample security, either in the form of a lien upon real estate or other property, or in the form of notes carrying undoubted indorsements, these notes to bear interest from the time of the loan and to be payable in small installments beginning soon after the completion of the college course, and each student borrower becoming, when he takes a loan, a member of a loan fund association, and after the manner of a building association, becoming a member of a class, with other borrowers of the same year, his obligations to cease whenever his payments, with his share of the earnings of his class, shall equal the amount of his loan and interest thereon at the usual rate.

To inaugurate this plan, it would require probably about ten thousand dollars. I am confident that such a fund could be made to return six per cent interest annually, with good guarantee for the principal. I hope that this matter may receive your careful consideration, and that if it recommends itself to the Board, it may be possible to find some person or persons ready to contribute the necessary capital fund.

Endowment.—Our work is expensive. It involves many lines of work, and attention to a great number of details. To be done well it requires a large number of instructors.

For the development of this Institution, it is necessary that its funds shall be increased, and that its income be permanent and

certain. It is especially unfortunate that the State has been unwilling to follow a suggestion made by your Board many years ago to grant it the income of a fixed tax, which would increase with the population and wealth of the State. Such a fund should be sufficient to furnish both the assistance which the State should give to instruction, and the funds to provide the necessary buildings and other facilities. It is good for neither the College or the State to require the College officers to visit each legislature to lobby for the appropriation which the College ought to have.

In the State of Colorado, which is about half as populous and less than half as wealthy as Maine, the State College receives for the agricultural department alone the product of a tax of one-sixth of a mill. If the State of Maine were to deal with its State College, which covers not only agriculture but also general science and the mechanic arts, in a way equally liberal, the College would receive annually nearly one hundred thousand dollars from the State.

I have no doubt that such an expenditure would be of the greatest benefit to the State. With it, it would be possible to build up here an institution of the greatest breadth and usefulness, which would be able to furnish facilities and opportunities excelled by those of very few colleges. And its situation in a locality which still clings to simple and inexpensive customs would be a guarantee that these advantages should be given to the student at an expense far below that of any other equal college in New England.

It is worthy of note here that State action in the near past has actually reduced the annual income of the College by about thirteen thousand dollars. The larger part of this reduction was made when the College received further endowments from the general government.

I wish to call the attention of persons of wealth and liberal spirit to the need of the College for endowment. The State College of New York, Cornell University, has received many private endowments aggregating several millions of dollars, the State College of Indiana, Purdue University, has received several hundred thousands of dollars, and the New Hampshire State College has received a large private endowment, which is reported to amount to a million dollars or more. Institutions of similar character have been endowed very liberally by private individuals, in many of the large cities. Prominent among these are the Pratt Institute in Brook-

lyn, the Drexell Institute in Philadelphia, the Armour Institute in Chicago. These institutions are doing work of essentially the same character, though of lower grade, than that of the Maine State College.

This State contains no city large enough to demand such an institute. The State itself, however, needs such an institution, and I am confident there must be within its bounds persons who would be glad to assist its work.

TREASURER'S REPORT.

To the Trustees of the Maine State College:

The Treasurer of the College has the honor to submit the following report concerning the financial condition of the institution.

The endowment funds are invested at the present time as follows:

COBURN BEQUEST	-	$100,000 00
State of Maine bonds at 4% interest.		
UNITED STATES LAND GRANT FUND	-	118,300 00
State of Maine bonds at 5% interest.		
ACCUMULATED INTEREST ON LAND GRANT FUND	-	9,000 00
Security Loan and Trust Company bonds at 6% interest	$3,000 00	
City of Bangor 6% bonds	3,000 00	
Knox and Lincoln Railroad 5% bonds	1,000 00	
Trenton, N. J., Passenger Railway 6% bonds	1,000 00	
Portland and Rumford Falls Railroad 5% bonds	1,000 00	
THE COBURN MILITARY LOAN FUND	-	100 00
College treasury	$70 00	
Loaned	30 00	
THE FRANK KIDDER SCHOLARSHIP FUND	-	675 00
Bangor Savings Bank	$675 00	
THE NEHEMIAH KITTRIDGE LOAN FUND	-	716 72
Bangor Savings Bank	$491 72	
Loaned	225 00	

During the year the College has received $198 in full for the bonds of the Hallowell Classical Institute, heretofore reported as a part of the endowment fund, and the same has been expended for premium on new bonds purchased during the year.

The income to the College from all sources for the next year will be as follows:

Coburn Bequest	$4,000 00
Land Grant Fund	5,915 00
Security Loan and Trust Company	180 00
Knox and Lincoln Bonds	50 00
Trenton Passenger Railway Company	60 00
Portland and Rumford Falls Railroad Company	50 00
State Appropriation	7,000 00
United States Government—Morrill Bill	19,000 00
United States Government—Hatch Bill for Experiment Station	15,000 00
From inspection of fertilizers, Experiment Station	850 00
From other sources, Experiment Station	325 93
Rent of houses on campus	614 00
	$53,044 93

General Statement of the Receipts and Expenditures for the Year Ending June 30, 1893.

RECEIPTS FROM JUNE 30, 1892, TO JUNE 30, 1893.

Balance on hand July 1, 1892	$ 725 01
State appropriations	5,000 00
United States appropriation under the Hatch Act	15,000 00
United States appropriation under the Morrill Act	18,000 00
Interest on Coburn Fund	4,000 00
" " Land Grant Fund	5,915 00
" " City of Bangor bonds	180 00
" " Security Loan and Trust Company bonds	180 00
Rent	404 00
W. H. Jordan, Director, for Experiment Station	272 55
W. M. Munson, for Horticultural Department, College	48 45
W. M. Munson, for Horticultural Department, Station	84 38
Interest on deposits, etc	66 14
For coal	936 83
Diplomas	20 08
Transient boarders at boarding house	237 60
Department of Physics	12 00
Sundry small receipts	51 68
Insurance on President's house	1,492 50
Chapel chairs	68
Chemical Laboratory	9 69
Natural History Department	3 10
Mechanical Engineering Department	7 06
Work-shop	745 17
Civil Engineering Department	3 95
World's Fair Commissioners	200 00
Fred Fulsom, for granite	20 00
W. T. Haines, from sale of Hallowell Classical Institute bonds	198 00
Experiment Station, water supply	200 00
From students, for board, etc	15,756 86
Treasurer's notes	3,500 00
Cross entry in cash account	10
	$75,270 83

EXPENDITURES FROM JUNE 30, 1892, TO JUNE 30, 1893.

Department of Agriculture	$ 3 20
Boarding house	8,819 61
F. T. Burpee, wages as janitor	600 00
Botany and entomology, Experiment Station	14 87
Chemical Laboratory, Experiment Station	281 47
Apparatus for Civil Engineering Department	408 75
Apparatus for Department of Chemistry	52 46
Expenses on clock	3 75
Advertising circular	91 93
For diplomas	44 75
Construction of dairy building	362 44
General expenses—College	1,608 64
General expenses—Experiment Station	160 89
Field and feeding, Experiment Station	1,253 61
On account of the farm	598 68
For fuel	3,527 57
Foundry account	104 05
Furnishing Wingate Hall	472 18
Fertilizer inspection, Experiment Station	134 80
Horticultural Department, Experiment Station	689 56
Horticultural Department, College	491 83
Construction of head house, College	67 83
Horticultural Department, construction and repairs, Experiment Station	41 04
Horticultural Department, general expense	20 69
Insurance	20 00
Horticultural Department, grounds	1,272 50
Incidentals	600 94
Interest and discount	34 75
Library, for Department of Agriculture	67 27
" " " " Chemistry	65 22
" " " " Civil Engineering	168 86
" " " " Economics	28 52

General Statement—Continued.

EXPENDITURES—Continued.

Library, for Department of Horticulture	$70 57
" " " " Literature	1 55
" " " " Mechanical Engineering	51 50
" " " " Metaphysics	12 75
" " " " Natural History	12 50
" " " " Physics	38 79
" " general expenses	264 26
" " Experiment Station	120 85
Military Department	362 01
Department of Mineralogy	88 03
Apparatus for Mechanical Engineering Department	336 54
Mineralogical laboratory	140 83
Meteorology, Experiment Station	30 70
Apparatus for Natural History Department	660 19
Printing, Experiment Station	1,458 79
Apparatus for Department of Physics	380 07
Repairs on photographic room	37 97
Repairs on Q. T. V. Club house	20 53
General repairs	850 08
Repairs and construction, Experiment Station	145 00
Reading room	56 37
Stationery and postage, College	36 88
Stationery and postage, Experiment Station	93 95
B. F. Sturtevant, balance due on contract for heating apparatus	741 91
For running expenses of shop	1,248 79
General salary account	843 89
Travelling expenses, Experiment Station	135 35
Trustee expenses, College	489 85
Veterinary Science, Experiment Station	5 40
Trustee expenses, Experiment Station	16 00
Construction of tool house	23 88
Water supply	540 56
Water works construction	220 03
Construction of flag pole	17 29
Field day expenses	192 80
World's Fair, Civil Engineering Department	69 05
Berlin Bridge Company	1,319 79
Chapel chairs	14 28
World's Fair, Mechanical Engineering Department	191 20
Oak Hall repairs	114 67
Chemical Laboratory, College	83 34
Construction of cases, Natural History Department	590 15
Repairs of Chemical Laboratory	12 29
Heating apparatus of Engineering Building	18 00
Singing books for chapel	32 60
Repairs, Coburn Hall	24 26
Preparation and binding of meteorological reports	30 40
Construction of stand pipe	100 80
Heating apparatus of Oak Hall	89 85
World's Fair, general account	140 30
Horticultural Department, College, construction and repairs	14 65
Fuel account, Experiment Station	140 82
Farm improvements	151 42
Apparatus for photography	41 45
World's Fair, Natural History Department	54 11
Repairs on President's house	398 56
World's Fair, Experiment Station	501 87
Installing of electric lights	57 53
Lighting of Engineering Building	21 10
Repairs on farm stable	66 01
Repairs of gymnasium	164 75
Library, Military Department	14 00
Department of Mathematics and Astronomy	59 81
Athletics	46 95
Construction of embankment for target practice	112 25
Lighting of Y. M. C. A. room	60
" " Oak Hall	65 50
" " Work shop	10
Construction of potting and storage room, Horticultural Department	100 00

General Statement—Concluded.

EXPENDITURES—Concluded.

Athletic Association		$133 00
Water supply, Experiment Station		200 00
Bills payable		2,500 00
Personal accounts		64 51
		$39,599 09
College salaries		24,043 34
Station salaries		9,574 97
		$73,217 40
Balance on hand July 1, 1893		53 43
		$73,270 83

GEORGE H. HAMLIN, *Treasurer.*

HENRY LORD, *Auditor.*

Account with the United States Government Appropriation under the Morrill Act for the Year Ending June 30, 1893.

Balance unexpended June 30, 1892	$ 5,642 06	
Received from United States Treasury	18,000 00	
		$23,642 06
EXPENDITURES.		
Department of Agriculture, for salaries	$2,975 00	
" " " " apparatus	301 42	
" " " " text-books and reference books	137 84	
Departments of Civil & Mech. Engineering, for salaries	5,200 00	
" " " " " " apparatus	408 75	
" " " " " " machinery	336 54	
Departments of Civil & Mech. Engineering, for text-books and reference books	220 36	
Department of English, for salaries	3,000 00	
" " " " text-books and reference books	292 56	
" " Mathematics and Astronomy, for salaries	1,500 00	
" " " " " " apparatus	59 81	
" " Physics, for salaries	1,500 00	
" " " " apparatus	380 07	
" " " " text-books and reference books,	38 79	
" " Natural History, for salaries	4,800 00	
" " " " " apparatus	712 65	
" " " " " text-books and reference books	77 72	
" " Economics, for salary	1,000 00	
" " " " text-books and reference books	28 52	
		22,970 03
Balance unexpended June 30, 1893	-	672 03
		$23,642 06

Account with the Experiment Station Fund for the Year Ending June 30, 1893.

RECEIPTS.		
Balance on hand June 30, 1892	$229 63	
Amount received from W. H. Jordan, Director	356 93	
Amount received from the United States Treasurer as per appropriation for the year ending June 30, 1893	15,000 00	
		$15,586 56
EXPENDITURES.		
Botany and entomology	$ 14 87	
Chemical laboratory	281 47	
Expense account	160 89	
Field and feeding	1,253 61	
Fertilizer inspection	134 80	
Horticultural Department	689 56	
Meteorology	30 70	
Printing	1,458 79	
Construction and repairs	186 04	
Stationery and postage	93 95	
Travelling expenses	135 35	
Library	120 85	
Veterinary science	5 40	
Fuel account	140 82	
World's Fair account	501 87	
Trustee expenses	16 00	
Water supply	200 00	
Salaries	9,574 97	
		14,999 94
Balance unexpended June 30, 1893	-	586 62
		$15,586 56

General Statement of Receipts and Expenditures, Brought Forward to December 1, 1893.

RECEIPTS FROM JULY 1, 1893, TO DECEMBER 1, 1893.

State appropriation	$4,000 00
United States, appropriation under Hatch Act	7,500 00
" " " " Morrill Act	19,000 00
Rent	191 68
General account, Experiment Station	79 06
Interest	6 20
For coal	142 16
Diplomas	23 00
Department of Physics, general account	66 75
Bills payable, temporary loan	3,000 00
Shop account	91 20
From students, for board, etc.	2,142 90
General repairs	5 00
Orono Savings Bank	3,000 00
Interest on temporary deposit	113 00
Coburn Military Loan Fund	70 00
Department of Astronomy and Mathematics	40 00
Department of Physics, State appropriation	361 38
Reading-room	61 03
Horticultural Department, College	25 83
" " grounds	30 25
Fertilizer control, Experiment Station	165 00
Personal accounts	21 22
	$40,135 66

Receipts and Expenditures—CONTINUED.

EXPENDITURES FROM JULY 1, 1893, TO DECEMBER 1, 1893.

Department of Agriculture	$133 16
Athletics	43 60
Boarding house	1,774 41
F. T. Burpee, wages as janitor	200 00
Botany and entomology, Experiment Station	2 25
Bills payable	1,000 00
Chemical Laboratory, Experiment Station	65 75
Apparatus for Civil Engineering Department	882 50
" " Department of Chemistry	8 43
Advertising circular	5 50
Chemical Laboratory, College	4 81
Construction of dairy building	4 70
Diplomas	47 90
General expenses, College	449 16
" " Experiment Station	22 98
Embankment account for target practice	385 08
Field and feeding, Experiment Station	208 62
On account of the farm	767 34
For fuel	4,175 50
Foundry account	15 30
Furnishing Wingate Hall	92 50
Field day expenses	147 50
Fuel account, Experiment Station	33 75
Horticultural Department, Experiment Station	333 87
" " College	97 85
" " Experiment Station, construction and repairs	12 62
" " grounds	1,820 45
Incidentals	355 94
Interest on loans	37 00
Insurance on President's house	1,424 22
Installing electric lights	9 58
Library, for Experiment Station	22 25
" " Department of Economics	24 00
" " " " Horticulture	1 00
" " " " Military Science	25
" " " " Physics	7 30
" " general expenses	161 30
Lighting of Engineering Building	5 75
" " Y. M. C. A. room	50
" " Oak Hall	21 50
Military Department	241 55
Department of Mineralogy	7 15
Apparatus for Mechanical Engineering Department	1,411 71
Meteorology, Experiment Station	46 07
Apparatus for Natural History Department	314 69
Printing, Experiment Station	992 50
Apparatus for Department of Physics	38 49
" " photography	37 09
Construction of potting and storage room, Horticultural Department,	31 24
Repairs on Q. T. V. Club house	22 86
General repairs	204 30
Repairs on Chemical Laboratory	10 90
" " gymnasium	63 04
Reading room	72 98
Stationery and postage, College	79 06
" " " Experiment Station	84 25
For running expenses of shop	428 98
Travelling expenses, Experiment Station	149 70
Trustee expenses, College	76 00
Veterinary science, Experiment Station	26 41
Water supply, College	9 00
Water-works construction	9 00
World's Fair, Mechanical Engineering Department	10 00
" " general account	9 55
" " Experiment Station	9 00
Advertising account	239 30
Construction of janitor's barn	302 50
General account, Experiment Station	276 69
Personal accounts	62 70
Department of Mathematics and Astronomy	135 60
Furniture and fixtures	6 00
Repairs on boarding house	5 00
" " farm house	30 43

Receipts and Expenditures—Concluded.

EXPENDITURES—Concluded.

Maine State College	$3,241 96
Repairs on Oak Hall	52 85
Insurance, College	20 00
Department of Physics, general account	32 70
	23,597 37
College salaries	8,234 91
Station salaries	3,046 66
	34,878 94
Balance on hand December 1, 1893	5,256 72
	$40,135 76

APPENDIX.

THE MAINE STATE COLLEGE

REGULATIONS.

SELECTION OF STUDIES.

1. Every student must register at the Secretary's office at the beginning of each term, before being admitted to any classes.

2. The quota of regular studies for every student shall be such as to require, for a minimum, seventeen hours, and, for a maximum, twenty hours, of class-room work each week, exclusive of rhetorical exercises, and no student shall be allowed to take less than seventeen hours, nor more than twenty hours, of work each week without the special permission of the Faculty. In laboratory work and other exercises, not requiring preparation, two hours shall count as one in applying this rule.

3. A student desiring to pass any required study in advance, may take a special examination at the beginning of the term; and, if his paper shall be marked as high as grade 2, he may be passed in that study without attendance on recitations. But any student thus passed in advance must take such a number of studies as will give him the minimum prescribed quota of exercises.

4. If a student, in addition to his regular studies, desires to enter any class without the requirement of regular attendance or final examination, he may be allowed to do so by special vote of the Faculty. If he chooses to pass the examination in any study which he pursues in this way, he will receive credit for the same, but the grade assigned him will not be counted in computing his general rank.

5. Applications for changes in a student's course of study must be presented in writing to the Faculty through the President. Such applications will ordinarily be considered at the meetings of the Faculty on Monday afternoons, and, to ensure prompt action, should be presented to the President not later than Monday noon.

STANDINGS AND GRADES.

6. A record of the work of each student, to be indicated by a numerical standing on a scale of 100, shall be made up at the completion of each study. This record shall be based upon a daily record of recitations, written recitations, other special exercises and the examination, or upon the examination alone, at the discretion of the instructor.

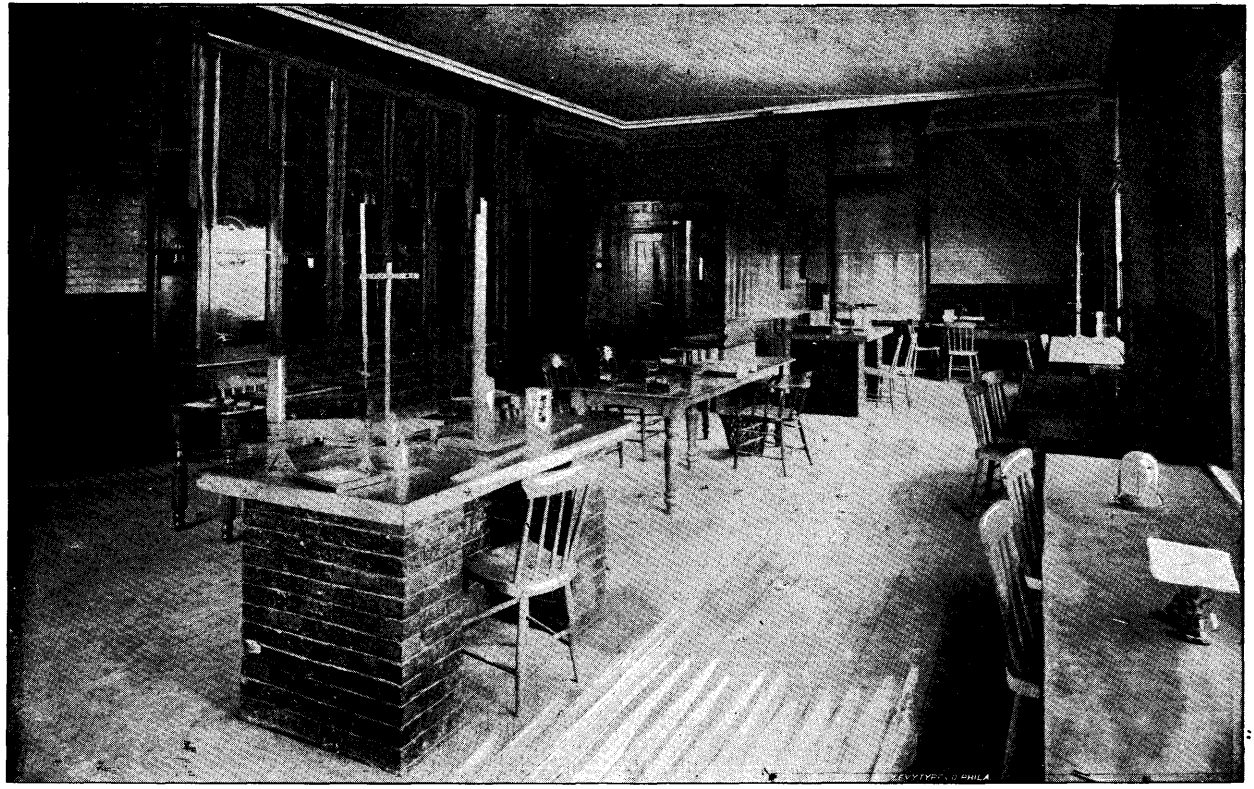
7. The standing for the term shall be found by multiplying the standing in each study by the number of exercises in that study, and dividing the sum of the products by the number of exercises in all studies.

8. Every student who shall attain a standing of 70 or more shall pass, and every student who shall attain 65 or less shall not pass. Others shall pass or not, as the Faculty may decide in each case.

9. The character of the work of members of the Sophomore and Freshman classes shall be indicated by the announcement of their standing in each study. The general character of the work of other students shall be indicated by their assignment in each study to one of four grades, grade 1 denoting a standing of 90 or more; grade 2 a standing of 80 or more, but less than 90; grade 3 a standing of 70 or more, but less than 80; grade 4 a standing of less than 70. The Secretary of the Faculty shall send to each student within three weeks after the end of each term a report of his standing or grade in each study which he has pursued during the term.

ABSENCES FROM RECITATIONS AND EXAMINATIONS.

10. *A student who is absent from ten per cent. or more of the exercises in any study shall be excluded from examination. If, however, the Faculty are satisfied that all or the major part of the absences in question are due to severe and protracted sickness, protracted absence from town with permission, or other such unquestionable reason, they may admit the student to examination, provided that the number of absences for which he presents no satisfactory excuse shall*



PHYSICAL LABORATORY.

not exceed ten per cent of the total number of exercises diminished by the number of absences for which his excuses are satisfactory. A student admitted to examination as above provided may be required, at the discretion of the instructor, to pass a preliminary examination.

11. A student whose rank for recitations for any study would average 90 or more if each absence were counted as zero, may be exempted from examination in that study at the discretion of the instructor. The term rank of a student so excused from examination shall be based upon the exercises at which he was present

12. Absences from military exercises in excess of ten per cent of the whole number, and absences from written or other special exercises shall be made up at such times and under such conditions as the instructors may prescribe. An instructor may, at his discretion, require a preliminary examination on the whole study, instead of the making up of particular written recitations or other special exercises.

13. A regular written examination continuing more than two hours, will exempt a student in attendance thereon, from recitations on the same day. A regular written examination continuing more than one hour, but not more than two hours, will exempt a student in attendance thereon from recitations in the same half day. A special examination, prize examination, or other occasional exercise, will exempt a student in attendance thereon from recitations which may be in progress at the same time, but not from any others.

14. Applications for excuse from examination, except when the examination occurs during the period for which the student has leave of absence from town, (see rule 22) must be made to the Faculty through the instructor of the department.

15. Applications for stated excuse from any study must be presented to the Faculty through the President.

RHETORICAL EXERCISES.

16. Absences and deficiencies in rhetorical exercises may be made up at such times and under such conditions as the instructors may prescribe.

17. In case of absence for a term, no credit shall be given for essays, or for any of the rhetorical exercises of the Senior year, unless the exercises are made up at such times and in such manner as the instructor of the department may prescribe.

18. *No student shall be graduated who fails to obtain a standing higher than grade 4 in rhetorical exercises; and a student falling below grade 3 in any year shall make up enough exercises to give him the required grade before being admitted to any classes the following year. Absences occurring under this regulation will not be considered excusable in the application of rule 10.*

ENTRANCE CONDITIONS.

19. Conditions imposed at the examination for admission shall be made up at such time and in such manner as the instructor may prescribe in each case. *If any student shall fail to make up his conditions before the commencement of the next college year, he shall then be excluded from all recitations until the conditions are made up, and absence from recitations occurring under this rule will not be considered excusable in the application of rule 10.*

20. A student who, at his entrance to College, is conditioned in any study in which instruction is given in College, may elect to make up such condition by reciting in the class; or he may be required to do so by the Faculty.

LEAVE OF ABSENCE.

21. *A student who desires excuse for absence from town must apply to the President, and, unless the circumstances of the case render it impracticable, permission to be absent must be obtained before the student's departure. Such permission will excuse all absences from morning prayers and church and all absences from examination during the period for which leave of absence is given; but cannot be pleaded, except in cases of continuous leave of absence for long periods of time, against the application of rule 10.*

CHURCH AND CHAPEL.

22. Every student is required to attend morning prayers daily in the College Chapel, and one service on Sunday in some one of the churches in the village. The record of attendance at chapel

and church will be kept by the Secretary, and any student whose name is not called in the church-roll in any of the classes, or who is absent from the class on the day of the calling of the church-roll, must report to the Secretary in writing.

23. Applications for stated excuse from morning prayers or from church must be made to the Faculty through the President.

24. *If any student's absences from prayers and church in any term, exclusive of absences canceled by leave of absence from the President, and of absence due to severe and protracted sickness or other such unquestionable reason, shall exceed fifteen per cent of the whole number, he shall be admonished by the President, and if between the date of his admonition and the close of the following term his absences from prayers and church, with the exceptions above noted, shall exceed twelve per cent he shall receive the censure of the Faculty. In applying this rule each absence from daily chapel service will be counted 1, and each absence from church service 3.*

PENALTIES.

25. Censure may be administered by vote of the Faculty, to any student whose absences from any required exercise indicate culpable neglect of college duty, or who is guilty of disorder or any reprehensible conduct.

26. Notice of censure administered to a student will be sent to his parent or guardian; and, unless the censure be followed by satisfactory improvement, the student will be liable to suspension or dismissal, at the discretion of the Faculty, and without the allegation of any specific offense.

27. A student who has received the censure of the Faculty shall not be entitled to honorable dismissal until the censure be removed by the Faculty.

28. For offences more grave than those for which censure would be administered, the penalty of suspension or dismissal may be inflicted by the Faculty.

EXAMINATIONS.

29. Students may learn whether they have passed or failed to pass in their studies by applying to the Secretary at the close of each term. If a student who has failed to pass in any examination shall neglect to obtain his report from the Secretary, such neglect

will not be considered an excuse for absence from the special examinations, nor for failure to pass the same.

30. For the benefit of those students who have been absent, with permission of the Faculty, from any examinations, or who have failed to pass in any study or who have been excluded from examination by reason of absences from recitations, special written examinations will be held immediately before the beginning of each term, at such times as shall be announced by the Secretary. Students desiring such examinations should apply to the Secretary for a schedule at the earliest possible date. No instructor shall hold any other examinations, except for the making up of entrance conditions, without the consent of the Faculty.

31. A member of the Senior class who, at the completion of the Senior examinations, is deficient in any study in which no regular examination is to be held during the remainder of the year, may be examined at such time and in such manner as the instructor having charge of that study may determine.

32. *If a student who has failed to pass at a regular examination, or who has been excluded from any examination, or who has been absent from any examination without satisfactory excuse, shall fail to pass at a special examination, before the study in question shall be taken up in regular course he shall recite with the next class, or, in the case of an elective study, shall substitute some other elective study in its place. If any conflict of studies arises under this rule, the repeated or substituted study shall have precedence, unless the Faculty order otherwise.*

33. If a student, who shall be required to repeat or substitute a study in accordance with rule 32, because of absence from the before-term special examinations held after the regular examination in the study in question, shall present satisfactory reasons for his absence, he may have his final examination postponed, if the Faculty consider his scholarship sufficiently good.

34. *A student who, at the close of the special examinations in the fall, is deficient by an amount equivalent to ten or more hours of work per week for a year, shall be ranked with the next lower class, unless, by special permission of the Faculty, his examinations have been postponed, as specified under rule 33.*

ATHLETICS.

35. The manager of each athletic team shall submit to the Faculty Committee on Athletics a schedule of all games before definite engagements are made. No money, however obtained, shall be expended for athletics by any student officer without the approval of this committee, and no student officer who shall have the handling of funds for athletic purposes, shall be relieved from responsibility until his accounts have been audited by this committee and found correct.

THE MAINE STATE COLLEGE

SHORT COURSE IN AGRICULTURE.

A winter course of lectures in Agriculture will be given at the Maine State College, commencing December 5, 1893, and continuing four months.

The course is especially designed to meet the needs of practical farmers and young men expecting to become farmers, who are unable to devote to preparatory study the time necessary for a full college course.

The lectures of the course will cover work on the following subjects: Agricultural Chemistry, Animal Industry, Dairy Husbandry, Horticulture, Veterinary Science, Agricultural Engineering, Entomology, Business Law.

The following synopsis will show briefly the method of treatment and the ground to be covered by these studies.

AGRICULTURAL CHEMISTRY.

Under this division lectures will be given on the origin, formation and composition of soils, and their classification according to physical characteristics; the nutrition of plants; tillage; farm manures, their composition, preservation and application; commercial fertilizers, their origin, composition, preparation and use; rotation of crops; fermentation and decay; animal nutrition; foods and fodders, their composition, digestibility and comparative values; the calculation of rations for different purposes; the composition and properties of milk; milk testing for purity and fat.

ANIMAL INDUSTRY.

Lectures will be given upon the origin and formation of the various breeds of cattle, horses, sheep and swine, and methods of improvement. Forms and types will be illustrated by models in

the college herds and flocks, and elsewhere. Practice in judging by scales of points, and tracing and tabulating pedigrees will be given. Handling and feeding, composition of foods, and formation of rations for different purposes will receive adequate attention.

DAIRY HUSBANDRY.

Instruction will consist of lectures upon all phases of the subject, from the formation of the milk to the finishing and marketing of its various products. Dairy Hall, with its thorough equipment, furnishes opportunities for the practical handling of milk, and manufacturing it into the different forms of cheese and butter, using the gravity and centrifugal devices for cream separation. Students will be made familiar with the various tests for determining the purity and value of milk, together with the details of the business management of creameries and factories.

HORTICULTURE.

There will be given a series of twenty lectures in practical horticulture, including directions for the construction, care and management of green-houses and other forcing structures; the culture of the leading vegetables in the field and under glass; the culture of orchard fruits and small fruits; also methods of propagation. The college forcing-houses will be open at all times and will furnish excellent opportunites for practical illustrations.

VETERINARY SCIENCE.

The work in veterinary science will consist of thirty lectures which will include instruction in some of the more essential points of the physiology and anatomy of our domestic animals; the diagnosis and treatment of the most common diseases; the dressing and caring for wounds; the care of breeding animals, before and after parturition; the means to be adopted to prevent the spread of contagious diseases, and the prevention of disease in general.

AGRICULTURAL ENGINEERING.

Instruction will be given in the subjects of farm drainage, irrigation, water supply for stock and household, road construction, wind-mills, steam boilers and engines, farm implements and machinery, construction of farm buildings and ventilation.

ENTOMOLOGY.

The instruction in entomology will be chiefly directed to those insects which work injury to farm and garden crops and to domestic animals, together with a discussion of the best methods of preventing their ravages.

BUSINESS LAW.

The lectures in business law will consist of discussions of the elementary principals of municipal law with which every citizen should be conversant, those questions which may most frequently present themselves to the farmer receiving more especial attention.

REQUIREMENTS AND EXPENSES.

For admission to this course, applicants should possess a good common school education. While no formal entrance examination is required, the Professor in charge will satisfy himself of the fitness of candidates to pursue the course with success.

Practical farmers will find this course especially valuable.

Those who desire to make themselves expert operatives in butter and cheese factories or in horticulture will be allowed to vary their course of study with this end in view.

All students will provide themselves with two white drilling suits for dairy work These suits can be conveniently obtained at Orono.

The expense of table board is about $3.00. Board and room, from $3.50 to $4.00 a week. Students in this course will be provided with rooms and board at the college so far as practicable, but for the most part, will, of necessity, find accommodations at the village of Orono, one mile from the college.

Tuition will be *free*.

Besides this course, the college offers courses in Agriculture of one, two and four years.

For further particulars address,

PROFESSOR WALTER BALENTINE,
Orono, Maine.

For particulars regarding other courses in the college, address,

PRESIDENT A. W. HARRIS,
Orono, Maine.

CATALOGUE OF THE GRADUATES.

1872.

Benjamin F. Gould, C. E., Real Estate and Insurance,.... *Hollister, Calif.*
George E. Hammond, C. E., Civil Engineer,..... *Elliot.*
Edwin J. Haskell, B. S., Silk Manufacturer,..... *Westbrook.*
Heddle Hilliard, C. E., Civil Engineer, Bangor and Aroostook Railroad, *Houlton.*
Eben D. Thomas, B. S., Farmer and Surveyor,..... *Grand Rapids, Mich.*
George O. Weston, B. S., Farmer,..... *Norridgewock.*

1873.

Russell W. Eaton, C. E., Agent Cabot Manufacturing Company, *Brunswick.*
George H. Hamlin, C. E., Professor of Civil Engineering, MAINE STATE COLLEGE, ... *Orono.*
Fred W. Holt, C. E., Civil Engineer,..... *St. George, N. B.*
John M. Oak, B. S., Merchant,..... *Bangor.*
*Charles E. Reed, C. E., Agent Columbia Bridge Company,... *Dayton, O.*
Frank Lamson-Scribner, B. S., Professor of Botany and Horticulture, University of Tennessee,..... *Knoxville, Tenn.*
Harvey B. Thayer, B. S., Druggist..... *Presque Isle.*

1874.

William A. Allen, C. E., Chief Engineer, Maine Central Railroad, *Portland.*
*Walter Balentine, M. S., Professor of Agriculture, MAINE STATE COLLEGE ..... *Orono.*
William H. Gerrish, B. S., M. D., Physician, ... *Deering.*
John I. Gurney, B. S., Florist,..... *Dorchester, Mass.*
Rodney D. Hunter, B. S., Insurance Agent,..... *Oakland, Calif.*
Louise H. Ramsdell, B. S. (Mrs. Milton D. Noyes),..... *Mapleton.*

*Deceased.

1875.

Solomon W. Bates, C. E., Patent Attorney,.....*Portland.*
Wilbur A. Bumps, C. E., M. D., Physician,.....*Dexter.*
*Samuel H. Clapp, C. E., Teacher,.....*Danvers, Mass.*
Lewis F. Coburn, C. E., Lawyer,.....*Eureka, Calif.*
Charles F. Colesworthy, B. S., Merchant,.....*Portland, Ore.*
*Charles F. Durham, C. E., Teacher,.....*Crescent City, Calif.*
Alfred M. Goodale, B. S., Agent Boston Manufacturing Company, *Waltham, Mass.*
Edson F. Hitchings, C. E., M. S., Instructor in Natural Science, East Maine Conference Seminary,.....*Bucksport.*
Whitman H. Jordan, M. S., Director, AGRICULTURAL EXPERIMENT STATION of the MAINE STATE COLLEGE,.....*Orono.*
Edward D. Mayo, M. E., Mechanical Engineer,.....*Minneapolis, Minn.*
Albert E. Mitchell, M. E., Mechanical Engineer, Erie Railroad, *Susquehanna, Pa.*
Allen G. Mitchell, C. E., Assistant Engineer, Pennsylvania Railroad, *Pittsburg, Pa.*
*Fred L. Moore, B. S., Teacher,.....*Visalia, Calif.*
Luther W. Rogers, B. S., Merchant,.....*Atlanta, Ga.*
Minott W. Sewall, M. E., Mechanical Engineer, Babcock & Wilcox Boiler Company,.....*New York.*
George M. Shaw, C. E.,.....*Oakland, Calif.*
Louis C. Southard, M. S., Lawyer, Boston, Residence, *North Easton, Mass.*
Wesley Webb, M. S., Editor FARM AND HOME, and President "State College for Colored Students,".....*Dover, Del.*
*Edgar A. Work, C. E., U. S. Military Academy,.....*Westpoint, N. Y.*

1876.

Edmund Abbott, B. S., M. D., Physician,.....*Providence, R. I.*
Charles P. Allen, B S., Lawyer and Banker,.....*Presque Isle.*
Elbridge H. Beckler, C. E.,.....*Chicago, Ills.*
Fred M. Bisbee, C. E., Road Master, G. C. & S. Fe R. R., *Cleburne, Tex.*
Edward M. Blanding, B. S., Editor and Publisher "MAINE INDUSTRIAL JOURNAL,".....*Bangor.*
*Charles M. Brainard, B. S.,.....*Skowhegan.*
*George H. Buker, B. S.,.....*Presque Isle.*
Florance H. Cowan, B. S., Teacher,.....*Lynn, Mass.*
Oliver Crosby, M. E., President American Hoist & Derrick Company, *St. Paul, Minn.*
Vetal Cyr, B. S., Principal Madawaska Training School,.....*Fort Kent.*
James E. Dike, C. E., Civil Engineer,.....*Port Falls, Idaho.*
*Willis O. Dike, B. S.,.....*Gorham.*
Horace M. Estabrook, M. S., M. A., Professor of Rhetoric and Modern Languages, MAINE STATE COLLEGE,.....*Orono.*

*Deceased.

Arthur M. Farrington, B. S., D. V. S., Chief of Miscellaneous Division, Bureau of Animal Industry, U. S. Department of Agriculture, *Washington, D. C.*
George O. Foss, C. E., Assistant Engineer, G. N. R. R., ... *Helena, Mon.*
William T. Haines, B. S., LL. B., Lawyer. ..... *Waterville.*
Henry F. Hamilton, B. S., D. D. S., Dentist, ... *Boston, Mass.*
Newell P. Haskell, B. S., Farmer, ... *Orono.*
Edward S. How, M. E., Clerk, U. S. Treasury Department, *Washington, D. C.*
Philip W. Hubbard, B. S., Nurseryman, ... *Alhambra, Calif.*
Samuel M. Jones, M. E., Mechanical Engineer, ... *Springfield, Mass.*
Albert A. Lewis, B. S , Clergyman, ... *Bath.*
Herbert A. Long, M. E., Farmer, ... *Machias.*
Luther R. Lothrop, C. E., Chief Engineer, L. L. R. R., .. *St. Paul, Minn.*
Nelson H. Martin, B. S., Merchant, ... *Fort Fairfield.*
Charles E. Oak, M. E., State Land Agent and Forest Commissioner, *Augusta.*
George D. Parks, C. E., Lawyer, ... *Fort Payne, Ala.*
Haywood Pierce, B. S., Proprietor, Granite Works, ... *Frankfort.*
Frank R. Reed, C E , Civil Engineer, ... *Auburn.*
Henry J. Reynolds, B. S., Druggist, ... *Eastport.*
Charles W. Rogers, M. E., Mechanical Engineer, ... *Chicago, Ills.*
William L. Stevens, M. E., Flour Commission Merchant, *Minneapolis, Minn.*
John H. Williams, B. S., Surveyor, ... *Elk River, Minn.*

1877.

Alvah D. Blackinton, C. E., Chief Engineer, E. & W. Railway, *Dunmore, Pa.*
Robert B. Burns, C. E., Resident Engineer, A. & P. R. R., *Prescott, Ariz.*
Eugene H. Dakin, B. S., Secretary and Treasurer, Industrial Publishing Company, ... *Bangor.*
Edward F. Danforth, B. S., LL. B., Lawyer, ... *Skowhegan.*
Augustus J. Elkins, B. M. E., Victoria Elevator Company, *Minneapolis, Minn.*
Alicia T. Emery, B. S., ... *Orono.*
Samuel W. Gould, B. S., Lawyer, ... *Skowhegan.*
*Joseph C. Lunt, B. C. E., Civil Engineer, Mexican Central Railroad, *El Paso, Tex.*
Fred F. Phillips, B. S., Manager Equitable Life Assurance Society, *Washington, D. C.*
*Samuel Shaw, B. M. E., Architectural Draughtsman, ... *Boston, Mass.*
Frank P. Stone, B. S., Druggist, ... *Norway.*
Thomas J. Stevens, B. M. E., Druggist, ... *Portland.*
George E. Sturgis, B. C. E., Druggist, ... *Portland, Ore.*
Charles E. Towne, B. C. E., U. S. Surveyor, U. S. Deputy Mineral Surveyor and Mining Engineer, ... *Rocky Bar, Idaho.*

*Deceased.

James W. Weeks, B. M. E., Architect,.....*North Des Moines, Iowa.*
Nellie E. Weeks, B. S., (Mrs. Llewellyn Spencer),.....*Orono.*
Ivan E. Webster, B. S.,.....*Orono.*

1878.

Emma Brown, B. S., Supervisor of Schools, (Mrs. Charles Gilman), *Enfield.*
Andrew J. Caldwell, B. M. E., Mechanical Engineer.....*New York.*
Cecil C. Chamberlain, B. S., Lumber Merchant,.....*Enderlin, N. D.*
Geo. E. Fernald, B. C. E., Salesman,.....*Chicago, Ills.*
James Heald, B. S., Civil Engineer,.....*Seattle, Wash.*
John Locke, Jr., B. S., Chief Clerk Freight Department, Maine Central Railroad,.....*Portland.*
Frank J. Oakes, B. C. E., Mechanical Engineer,.....*New York.*
John C. Patterson, B. C. E., Assistant Engineer, Great Northern Railroad, ...*Minneapolis, Minn.*
Winfield E. Tripp, B. C. E., LL. B., Lawyer,.....*Iron River, Wis.*
Edward C. Walker, B. S., Lawyer,.....*Lovell.*
Otis C. Webster, B. S., Druggist,.....*Augusta.*

1879.

Harry B. Bean, C. E.,.....*San Jose, Calif.*
Edward J. Blake, C. E., Chief Engineer, Chicago, Burlington, and Quincy Railroad,.....*Chicago, Ills.*
Simon P. Crosby, B S., Lawyer,.....*St. Paul, Minn.*
John D. Cutter, B. S., M. D., Physician,.....*Tomahawk, Wis.*
Wilbur F. Decker, M. E., Broker,.....*Minneapolis, Minn.*
David A. Decrow, B. C. E., Hydraulic and Mechanical Engineer, Holly Manufacturing Company,.....*Lockport, N. Y.*
Willis E. Ferguson, B. S., Nurseryman,.....*Glendora, Calif.*
Charles W. Gibbs, C. E., Civil Engineer, S. R. R.,.....*Ridgway, Colo.*
Annie M. Gould, B. S., (Mrs. Loomis F. Goodale),.....*St. Joseph, Mo.*
*Nellie M. Holt, B. S., Teacher,.....*Orono.*
Frank E. Kidder, C. E., Architect, ...*Denver, Colo.*
Mark D. Libby, B. C. E., Lawyer,.....*Kingman, Kan.*
*Charles S. Loring, B. M. E., Machinist,.....*Lewiston.*
George P. Merrill, M. S., Ph. D., Curator Department of Geology, National Museum, *Washington, D. C.*
John W. Meserve, B. M. E., Engineer, Superintendent Crane Department, Yale and Towne Manufacturing Company,.....*Stamford, Conn.*
Arthur L. Moore, B. S., Farmer,.....*Limerick.*
Charles A. Morse, C. E., Resident Engineer, Atchison, Topeka, and Santa Fe Railroad,.....*Pueblo, Colo.*
Fred D. Potter, B. M. E., Engineer and Contractor,.....*New York.*

*Deceased.

Alton J. Shaw, B. M. E., President and Superintendent Shaw Electric Crane Company,.....*Muskegon, Mich.*
Percia A. Vinal, M. S., (Mrs. Albert White),.....*Orono.*
Geo. O. Warren, B. S , Farmer,.....*Fryeburg.*
Herbert Webster, B. S., Nurseryman, ...*Alhambra, Calif.*

1880.

Horace W. Atwood, B. S., D. V. S., Real Estate Broker, *Brockton, Mass.*
James M. Bartlett, M. S., Chemist of the AGRICULTURAL EXPERIMENT STATION OF THE MAINE STATE COLLEGE, ...*Orono.*
Albert H. Brown, B. S., Banker,.....*Old Town.*
Marcia Davis, B. S., (Mrs. Joseph D. Stevens), ...*Denver, Colo.*
Fred B. Elliot, B. S., Farmer and Stock Breeder,.....*Bowdoinham.*
Sarah P. Farrington, B. S , (Mrs. George P. Merrill), *Washington, D. C.*
Charles W. Fernald, B. S., Merchant, ...*South Levant.*
Fred W. Fickett, M. S., Reçorder Municipal Court,.....*Galveston, Tex.*
George W. Lufkin, B. C. E., Assistant Engineer W. & N. Railroad, *Coatesville, Pa.*
Frank A. Mansfield, M. S., B. D., Clergyman, ...*Boston, Mass.*
Annie A. Matthews, B. S., Teacher, ...*Stillwater.*
Henry W. Murray, B. C. E., Farmer and Teacher, ...*Napa, Calif.*
Franklin R. Patten, C. E., Engineer Baltimore and Ohio Railroad, *Philadelphia, Pa.*
Charles T. Pease, B. S., Civil Engineer,.....*Rico, Colo.*
James F. Purington, B. S., Railway Postal Clerk, ...*Bath.*

1881.

Henry H. Andrews, M. E., Bank Cashier,.....*Callaway, Neb.*
Henry W. Brown, M. S., Professor Literary Institute,*New Hampton, N. H.*
Clara L. Buck, B. S., (Mrs. Thomas W. Hine), ...*Phœnix, Ariz.*
Fannie E. Colburn, B. S., Teacher, (Mrs. Arthur L. Fernald), *Omaha, Neb.*
Edward H. Farrington, M. S., Chemist of the Agricultural Experiment Station of the University of Illinois, ...*Champaign, Ills.*
Oliver C. Farrington, M. S., Ph. D., Teacher, ...*Cape Elizabeth.*
Charles H. Fogg, B. C. E., Civil Engineer, ...*Greensburg, Pa.*
Aldana T. Ingalls, B. C. E ,.....*Placer, Mont.*
*Robert J. Johnson, B. C. E., Civil Engineer,.....*Butte, Mont.*
Clara A. Libby, B. S., Millinery and Fancy Goods,.....*Augusta.*
Horace F. McIntyer, B. M. E., Miller,.....*Waldoboro.*
Charles L. Moor, B. C. E., Book-keeper, ...*Hartland.*
*Benjamin F. Murray, B. C. E., Farmer,.....*Stillwater.*
Edwin W. Osborn, B. C. E., Chief Clerk General Superintendent's Department, Northern Pacific Railroad,.....*St. Paul, Minn.*

*Deceased.

Oscar L. Pease, B. S., Station Agent, Southern Pacific Railroad, *Gila Bend, Ariz.*
Harold M. Plaisted, M. E., Patent Solicitor and Engineer, *St. Louis, Mo.*
Alice I. Ring, B. S., ... *Orono.*
Mary L. Ring, B. S., (Mrs. H. H. Andrews), ... *Callaway, Neb.*
*Roscoe L. Smith, B. S., Farmer, ... *Lewiston.*
George W. Sturtevant, B. C. E., Civil and Hydraulic Engineer, *Chicago, Ills.*
Frank S. Wade, B. S., M. D., Physician, ... *New Richmond, Wis.*
*Walter A. White, B. C. E., LL. B., Lawyer, ... *Newport.*
*John B. Wilson, B. S., ... *Orono.*
Levi A. Wyman, B. C. E., Real Estate Lawyer, and Civil Engineer, *Ellsworth.*

1882.

Charles S. Bickford, B. S., Business Manager, "*Age*", ... *Belfast.*
Jacob L. Boynton, B. S., ... *Lynn, Mass.*
Charles W. Brown, B. M. E., Draughtsman, U. S. Patent Office, *Washington, D C.*
Stephen J. Buzzell, B. C. E., Civil Engineer, ... *Old Town.*
Oscar H. Dunton, M. E., ... *Cincinnati, O.*
Walter Flint, M. E., Professor of Mechanical Engineering, MAINE STATE COLLEGE, ... *Orono.*
George R. Fuller, B. S., Lawyer, ... *Southwest Harbor.*
Charles C. Garland, B. S., Banker and Dealer in Pine Land, *Minneapolis, Minn.*
Joseph F. Gould, B. S., City Attorney, ... *Old Town.*
Thomas W. Hine, B. S., Banker, ... *Phœnix, Ariz.*
William R. Howard, B. S., Teacher Vermont Academy, *Saxton's River, Vt.*
Alonzo L. Hurd, B. S., M. D., Physician, ... *Somers, Conn.*
Alfred J. Keith, B. C. E., Shoe Manufacturer, ... *Old Town.*
Frank I. Kimball, C. E., Superintendent Carbon Coal Company, *Greensburg, Pa.*
James H. Patten, B. S., M. D., Physician, ... *Clifton.*
Frederick M. Reed, B. M. E., Draughtsman, B. & S. Manufacturing Company, ... *Providence, R. I.*
Gleason C. Snow, B. S., Farmer, ... *North Orrington.*
Avery P. Starrett, B. S., Farmer, ... *Warren.*
Frank H. Todd, B. C. E., Civil Engineer, Northern Pacific Railroad, *West Duluth, Minn.*
Eben C. Webster, B. S., Treasurer Webster Paper Company, ... *Orono*
Willard A. Wight, B. C. E., Superintendent Gas and Electric Light Works, ... *Trinidad, Colo.*
Daniel C. Woodward, B. M. E., Draughtsman, ... *Madison, Wis.*

*Deceased.

1883.

James H. Cain, B. S., ... *Orono.*
Jonathan V. Cilley, B. C. E., Inspector General of Railroads, *Buenos Ayres, Argentine Republic, S A.*
Frank E. Emery, B. S., Assistant Professor of Agriculture in the North Carolina College and Agriculturist to the Agricultural Experiment Station, ... *Raleigh, N. C.*
Arthur L. Fernald, B. S., Merchant ..... *Omaha, Neb.*
Bartholomew P. Kelleher, B. S., M. D., Physician, ... *Orono.*
Lucius H. Merrill, B. S., Chemist of the AGRICULTURAL EXPERIMENT STATION OF THE MAINE STATE COLLEGE, ... *Orono.*
Jennie C. Michael, B. S., Teacher, ... *Stillwater.*
Charles W. Mullen, B. C. E., Civil Engineer, ... *Old Town.*
Truman M. Patten, B. C. E., Civil Engineer, ... *Sioux Falls, S. D.*
Harry W. Powers, B. S., Manufacturer, ... *Orono.*
Charles E. Putnam, B. C. E., Civil Engineer, Franklin Park, *Boston, Mass.*
Lewis Robinson, Jr., B. M. E., M. D., Physician, ... *Kenduskeag.*
George A. Sutton, B. C. E., Farmer, ... *Orono.*
Levi W. Taylor, M. S., Principal of the Commercial Department of the Maine Central Institute, ... *Pittsfield.*

1884.

George H. Allan, B. S., Lawyer, ... *Portland.*
*Will H. Burleigh, B. C. E., ... *Vassalboro.*
Mary F. Conroy, B. S., (Mrs. A. R. Saunders), ... *Pullman, Wash.*
Leslie W. Cutter, B. C. E., Contractor and Builder, ... *Bangor.*
Harriet C. Fernald, M. S., Librarian of the MAINE STATE COLLEGE, *Orono.*
Elmer E. Hatch, B. S., Farmer, ... *Etchetah, Mont.*
John E. Hill, B. C. E., Civil Engineer, ... *Anoka, Minn.*
Joseph G. Kelley, C. E., Civil Engineer, ... *Eugene, Ore.*
Edwin F. Ladd, B. S., Professor of Chemistry, North Dakota Agricultural College and Chemist of the Agricultural Experiment Station, *Fargo, N. D.*
Clarence S. Lunt, B. C. E., City Editor "*Commercial*" ..... *Bangor.*
Fred L. Stevens, B. S., ... *New York.*
William Webber, M. E., Draughtsman, McCormick H. M. Works, *Chicago, Ills.*

1885.

George W. Chamberlain, B. S., Principal Grammar School, ... *Calais.*
Asher Dole, B. C. E., Civil Engineer, ... *Superior, Wis.*
Orion J. Dutton, B. S., Broker, ... *Boston, Mass.*
Henry T. Fernald, M. S., Ph. D., Professor of Zoology, Pennsylvania State College, ... *State College, Pa.*
Elmer O. Goodridge, M. E., Electrical Engineer, ... *Bradford, Mass.*
George L. Hanscom, B. S., Clergyman, ... *Sheldon, Iowa.*

*Deceased.

James N. Hart, C. E., Professor of Mathematics and Astronomy, MAINE STATE COLLEGE, ... *Orono.*
Frank E Hull, C. E., Civil Engineer, Bangor and Aroostook Railroad, *Warren.*
Austin H. Keyes, B. C. E., Principal High School, ... *Auburn, R. I.*
William Morey, Jr., B. C. E., Examiner of Surveys, General Land Office, *Washington, D. C.*
Joseph P. Moulton, B. S., Farmer, ... *Springvale.*
Leonard G. Paine, M. E., Treasurer Belknap Motor Company, .. *Portland.*
Elmer E. Pennell, B. M. E., Machinist, ... *Saccarappa.*
Louis W. Riggs, B. M. E., Ph. B., Instructor in Science and Mathematics, *Englewood, N. J.*
Fremont L. Russell, B. S., V. S., Veterinarian of the AGRICULTURAL EXPERIMENT STATION OF THE MAINE STATE COLLEGE, ... *Orono.*

1886.

Bert J. Allen, B. C. E., Principal Pratt Free School, *North Middleboro, Mass.*
Josiah M. Ayer, B. C. E., Assistant Engineer, Boston and Maine Railroad, ... *Somerville, Mass.*
George G. Barker, B. M. E., Draughtsman, McCormick H. M. Company, *Chicago, Ills.*
George F. Black, C. E., Road Master Mountain Division, Maine Central Railroad, ... *Portland.*
John D. Blagden, B. C. E., Observer, United States Weather Bureau, *Knott's Island, N. C.*
Heywood S. French, C. E., Civil Engineer, ... *Newtonville, Mass.*
Edwin D. Graves, C. E., Civil Engineer, Berlin Iron Bridge Company, *East Berlin, Conn.*
Ralph K. Jones, B. S., Kellogg Seamless Tube Company, .. *Findlay, Ohio.*
Elmer Lenfest, B. C. E., Civil Engineer, ... *Snohomish, Wash.*
James F. Lockwood, M. E., Chief Draughtsman, Otis Brothers and Co., *New York.*
George F. Lull, M. S., Chemist, Penobscot Chemical Fibre Company, *West Great Works.*
Willis H. Merriam, B. C. E., Lawyer, ... *Spokane, Wash.*
Elmer E. Merritt, M. E., Merchant, ... *Salt Lake City, Utah.*
Arthur D. Page, B. C. E., Civil Engineer, ... *St. Cloud, Minn.*
Irving B. Ray, B. C. E , Merchant, ... *Boston, Mass.*
Sidney S. Twombly, B. S., V. S., Consulting Veterinarian to the Agricultural Experiment Station, ... *Logan, Utah.*

1887.

John H. Burleigh, B. C. E., Civil Engineer, Sewerage System, *Newtonville, Mass.*
Luis V. P. Cilley, B. C. E., Civil Engineer, *Buenos Ayres, Argentine Republic, S. A.*

Bertrand E. Clark, M. S., Lawyer, ... *Bar Harbor.*
Edwin V. Coffin, B. C. E., Clerk, ... *Harrington.*
David W. Colby, B. S., Assistant in Department of Chemistry, MAINE STATE COLLEGE, ... *Orono.*
Alice A. Hicks, M. S., (Mrs. George F. Black), ... *Portland.*
James D. Lazell, B. M. E., Engineer and Contractor, ... *Roanoke, Va.*
Charles A. Mason, B. C. E., Civil Engineer, ... *Portland, Ore.*
Henry A. McNally, B. C. E., Observer, U. S. Weather Bureau, *Montgomery, Ala.*
Fenton Merrill, B. C. E., Lumberman, ... *Laurence, Wash.*
Addison R. Saunders, M. E., Professor of Mechanical Engineering, Washington Agricultural College, ... *Pullman, Wash.*
Cassius A. Sears, B. C. E., Lumber Manufacturer, ... *Fort Kent.*
Charles H. Stevens, B. M. E., Lumber Manufacturer, *Grand Falls, N. B.*
Charles F. Sturtevant, C. E., Civil and Hydraulic Engineer, *St. Louis, Mo.*
Frank E. Trask, C. E., Civil and Hydraulic Engineer, ... *Ontario, Calif.*
Charles T. Vose, B. C. E., Assistant Engineer, Maine Central Railroad, *Portland.*
Howard S. Webb, B. M. E., Instructor in Shop Work, MAINE STATE COLLEGE, ... *Orono.*
John S. Williams, B. S., LL. B., Lawyer, ... *Guilford.*

1888.

Hiram B. Andrews, B. C. E., Draughtsman, West End Railway, *Boston, Mass.*
*George S. Batchelder, B. M. E., Draughtsman, ... *Bangor.*
Charles D. W. Blanchard, B. C. E., with New England Sulphite Digester Company, ... *Old Town.*
John R. Boardman, B. S., Secretary Young Men's Christian Association, *Auburn.*
Francis S. Brick, M. S , Principal Powers Institute, ... *Bernardston, Mass.*
Harry Butler, B. S., Medical Student, ... *Philadelphia, Pa.*
Dudley E. Campbell, C. E., Principal Grammar School, ... *Newport, R. I.*
Fred L. Eastman, B. M. E., Draughtsman, ... *Lynn, Mass.*
Edward H. Ellwell, Jr., B. S., Journalist, "*Portland Transcript*," *Portland.*
William J. Hancock, M. S., Professor of Natural Science, Antioch College, ... *Yellow Springs, Ohio.*
John W. Hatch, M. S., Clergyman, ... *Kingman.*
Claude L. Howes, M. E. Assistant Engineer, Thompson-Houston Electric Company, ... *Boston, Mass.*
Harry F. Lincoln, B. S., Electrician, ... *Millbury, Mass.*
Thomas G. Lord, M. S., Farmer, ... *Skowhegan.*

*Deceased.

Ralph H. Marsh, M. D., Physician,.....*Lincoln.*
*Seymore F. Miller, B. C. E.,.....*Burlington.*
William Philbrook, B. C. E., Washburn Shop, Polytechnic Institute, *Worcester, Mass.*
Seymour E. Rogers, B. M. E., Draughtsman,.....*Greeley, Colo.*
George E. Seabury, B. M. E.,.....*Bangor.*
Frank L. Small, B. M. E., Engineer H. & O. P. Railway Company, *Hampton, Va.*
Frank A. Smith, C. E., Civil Engineer,.....*St. Cloud, Minn.*
Nathaniel E. Wilson, M. S., Chemist Agricultural Experiment Station, *Reno, Nev.*

1889.

Fred P. Briggs, B. S., Assistant in Department of Natural History, MAINE STATE COLLEGE,.....*Orono.*
Charles G. Cushman, B. M. E., President and Manager of the Cushman Iron Company,.....*Roanoke, Va.*
Joseph W. Edgerly, Jr., B. C. E., Civil Engineer, Maine Shore Line Railroad,.....*Princeton.*
Jere S. Ferguson, M. S., M. D., Instructor University of the City of New York,.....*New York.*
George G. Freeman, B. S., Supervisor of Schools,.....*Cherryfield.*
George M. Gay, B. S., Clerk,.....*Damariscotta.*
Eben R. Haggett, B. S., Lumber Merchant,.....*Newcastle.*
Nellie L. Leavitt, B. S., Teacher,.....*Deer Lodge, Mont.*
John Reed, B. C. E., Civil Engineer, C. & M. R. R.,.....*Gorham, N. H.*
Nellie W. Reed, B. S., Teacher,.....*Stillwater.*
*Fred Stevens, B. M. E., Draughtsman,.....*Winter Harbor.*
Gilbert S. Vickery, B. C. E., Civil Engineer,.....*Steelton, Pa.*
*Mark E. White, B. C. E., Civil Engineer, Bangor and Aroostook Railroad,.....*Ashland.*
Mortimer F. Wilson, B. S., Merchant.....*Orono.*

1890.

Frank O. Andrews, B. M. E., Draughtsman, West End Street Railway Company,.....*Boston, Mass.*
George H. Babb, B. M. E., Instructor, Kamehameha School, *Honolulu, H. I.*
John Bird, 2d, B. M. E., Superintendent of the Cushman Iron Company, *Roanoke, Va.*
Ralph H. Blackington, B. S., Conductor,.....*Rockland.*
George I. Bowden, B. C. E.,.....*South Penobscot.*
Hugo Clark, B. C. E., Lawyer,.....*Isaille, Wash.*
Alphonso J. Coffin, B. S., Business Manager, Roanoke "*Times*," *Roanoke, Va.*

*Deceased.

Walter E. Croxford, B. M. E., Draughtsman,..... *Charlestown, Mass.*
Fred T. Dow, B. M. E., Assistant Professor of Mechanical Engineering, Washington Agricultural College, ... *Pullman, Wash.*
Albert W. Drew, B. M. E., Draughtsman with Newport News Dry Dock and Ship Building Company,..... *Newport News, Va.*
Harris D. Dunton, B. M. E., Draughtsman, Chicago Great Western Railway, ... *St. Paul, Minn.*
Horace P. Farrington, B. M. E., Teacher, Manual Training, *Philadelphia, Pa.*
George P. Gould, B. S., Superintendent of Schools,.. ..... *Old Town.*
Nathan C. Grover, B. C. E., Assistant in Department of Civil Engineering, MAINE STATE COLLEGE,..... *Orono.*
Allen C. Hardison, B. C. E., Civil Engineer,..... *Santa Paula, Calif.*
Chandler C. Harvey, C. E., Civil Engineer,..... *Fort Fairfield.*
Samuel H. T. Hayes, B. S., Assistant Horticulturist in the AGRICULTURAL EXPERIMENT STATION of the MAINE STATE COLLEGE, *Orono.*
Everett F. Heath, B. M. E., Merchant, ... *Monmouth.*
Edward H. Kelley, B. S., Editor "*Times*,"..... *Roanoke, Va.*
*George E. Keyes, B. M. E.,..... *Orland.*
Hannah E. Leavitt, B. S., (Mrs. Walter Flint)..... *Orono.*
Elmer L. Morey, B. C. E., Deputy Vice Consul,..... *Colombo, Ceylon.*
Edmund N. Morrill, B. S., ... *Portland.*
John W. Owen, Jr , B. C. E., Civil Engineer, G. N. R. R., *Helena, Mont.*
John V. Pierce, B. M. E., Draughtsman, Thomson-Houston Electric Company,..... *Lynn, Mass.*
William Bridgham Pierce, B. M. E., Lawyer,..... *Bangor.*
William Barron Pierce, B. M. E., Draughtsman, McCormick H. M. Co., *Chicago, Ills.*
George M. Pillsbury, B. S., Night Superintendent Pulp Mill, *Lisbon Falls.*
Fred G. Quincy, B. M. E., Lumber Surveyor,..... *Masardis.*
Joseph R. Rackliffe, B. C. E., Assistant Engineer, Chicago, Burlington and Quincy Railroad,..... *St. Joseph, Mo.*
Paul F. Reed, B. C. E., Sheep Raiser..... *Flagstaff, Ariz.*
Frank W. Sawyer, B. S., M. D., Physician,..... *Yonkers, N. Y.*
Clarence B. Swan, B. M. E., Merchant,..... *Old Town.*
Chester J. Wallace, B. C. E., Civil Engineer,..... *Jamaica Plain, Mass.*
Winfield S. Webb, C. E., Civil Engineer, Pennsylvania Railroad, *Gallitzen, Pa.*
Ralph H. Wight, B. C. E., Civil Engineer K. & G. B. & W. R. R., *Green Bay, Wis.*
Charles S. Williams, M. S., Post Graduate Student, Harvard University, *Cambridge, Mass.*

1891.

Ralph J. Arey, B. C. E.,..... *Winslow, Ariz.*
William M. Bailey, B. C. E., Civil Engineer,..... *West Newton, Mass.*

*Deceased.

Edmund Clark, B. S., Chemist,.....*Munhall, Pa.*
Charles Clayton, B. S.,.....*Bangor.*
Wallace R. Farrington, B. S., Advertising Department "*Sun*," *Lewiston.*
William R. Farrington, B. C. E., Civil Engineer,.....*Portland.*
John H. Flanagan, B. M. E., Mechanical Engineer, Harris Corliss Engine Company,.....*Providence, R. I.*
Joseph C. Graves, B. M. E., Draughtsman,.....*New York.*
Bert A. Hall, B. C. E., Civil Engineer, A. & P. R. R.,.....*Prescott, Ariz.*
Cyrus Hamlin, B. S., Student Long Island Medical School, *Brooklyn, N. Y.*
Prescott Keyes, Jr., B. C. E., Principal High School,.....*Bar Harbor.*
Charles H. Kilbourne, B. S., Salesman,.....*North Waterford.*
Robert W. Lord, B. M. E., Machinist,.....*Bath.*
Hugo G Menges, B. M. E., Draughtsman,.....*Boston, Mass.*
True L. Merrill, B. M. E., Lumberman,.....*Lawrence, Wash.*
Fred C. Moulton, B. S., with Gypsy Moth Commission,.....*Malden, Mass.*
William N. Patten, B. C. E., Civil Engineer,.....*Boston, Mass.*
Henry V. Starrett, B. S.,.....*Warren.*
John W. Steward, B. M. E., Manufacturer,.....*Skowhegan.*
Charles N. Taylor, B. C. E., Civil Engineer, City Sewerage System, *Newton Centre, Mass.*
George E. Thompson, B. C. E., Civil Engineer, Bangor and Aroostook Railroad.....*Orono.*
William A. Valentine, B. M. E., Teacher.....*Bethel.*

1892.

George F. Atherton, B. C. E., Instructor in Shop, State Reform School, *Cape Elizabeth.*
William H. Atkinson, B. C. E., Draughtsman, Cabot Manufacturing Company,.....*Brunswick.*
Mortimer L. Bristol, B. M. E., Draughtsman, Colt's Armory, *Hartford, Conn.*
William R. Butterfield, B. C. E.,.....*Milford.*
Roscoe C. Clark, B. M. E.,.....*Bethel.*
Ernest W. Danforth, B. C. E., Draughtsman, City Engineer's Office, *Somerville, Mass.*
Herbert E. Doolittle, B. C. E.,.....*Northfield, Mass.*
Mellen E. Farrington, B. M. E., with Lincoln Pulp and Paper Company, *Lincoln.*
Robert H. Fernald, B. M. E., Assistant in Department of Mechanical Engineering, Case School of Applied Science,.....*Cleveland, Ohio.*
John C. Gibbs, B. M. E.,.....*North Turner.*
Arthur C. Grover, B. C. E., Civil Engineer, Sewerage System, *Newton, Mass.*
Warren E. Healey, B. M. E., Superintendent Ready Rock Asphalt Roofing Company.....*St. Louis, Mo.*

William C. Holden, B. M. E., Teacher in the Manual Training Department of the City Schools,..... *Portland.*
George Maguire, B. C. E., Civil Engineer, Sewerage System, *Malden, Mass.*
Charles M. Randlett, B. S., Traveling Salesman,..... *Richmond.*
Stanley M. Timberlake, B. C. E., Draughtsman for Associated Factory Mutual Insurance Company..... *Boston, Mass.*
Frank S. Tolman, B. C. E., Teacher, Hampden Academy,..... *Hampden.*
Joseph A. Tyler, B. C. E., Civil Engineer, Boston Iron Works. *Cambridge, Mass.*

1893.

Hosea B. Buck, B. C. E., Draughtsman, City Engineer's Office, *Bangor.*
Walter W. Crosby, B. C. E., Civil Engineer ..... *Rumford Falls.*
Charles F. French, B. M. E., ... *Glenburn.*
Charles H. Gannett, B. C. E., Civil Engineer, ... *Augusta.*
George W. Hutchinson, B. C. E.,..... *Orono.*
Walter D. Jack, B. S., Chemist, ... *Brunswick.*
Charles P. Kittridge, B. S., ... *Prairie City, Iowa.*
Hugh McL. Lewis, B. C. E., Teacher,..... *South Berwick.*
Charles C. Murphy, B. C. E.,..... *Hampden.*
George F. Rowe, B. M. E., Draughtsman, with the New England Sulphite Digestion Company, ... *Bangor.*
Orrin J. Shaw, B. C. E., ... *Hampden.*
Harry M. Smith, B. M. E., ... *Bangor.*
John M. Webster, B. S., Bank Clerk, ... *Augusta.*
George A. Whitney, B. M. E , Merchant,..... *Lewiston.*
Hiram Williams, B. S., Medical Student, University of the City of New York, ... *New York.*

CATALOGUE OF NON-GRADUATES.

Average period of attendance, one and a half years. When the present residence is not known, the former residence is given. Special students are included in the classes with which they had most of their work.

Corrections are solicited.

1872.

John T. Bowler, Register of Deeds,.....*Bangor.*
William H. Cary, The Cary Odgdon Company,.....*Chicago, Ills.*
Edward F. Fisher,.....*San Diego, Calif.*
William H. George.....
William L. Harlow, Farmer,.....*Buckfield.*
George L. Macomber,.....*Windom, Minn.*
Charles C. Norton,.....*Buffalo Meadows, Nev.*
William B. Oleson, Clergyman and Principal Training School, *Honolulu.*
Frank W. Rollins, Clerk,.....*Stillwater, Minn.*
Oren S. Sargent, M. D., Physician,.....*Lawrence, Mass.*
*Marcus P. Shorey,.....*Old Town.*
Benjamin F. Watson, Farmer,.....*Levant.*

1873.

William H. Claflin, Merchant,.....*Boston, Mass.*
Joseph E. P. Clark, Book Business, 1017 Walnut St.,.....*Chicago, Ills.*
*John Jackson,.....*Alfred.*
Samuel Lane, Merchant,.....*Houlton.*
Wilbur F. Lovejoy, Book-keeper,.....*Winn.*
*Thomas P. Pease, Surgeon, U. S. A.,.....*Bridgton.*
Clarence Pullen, on Editorial Staff, the "*Sun*,".....*New York.*
Frederic A. Ransom,.....*Chicago, Ills.*

*Deceased.

1874.

Frank P. Burleigh, ... *Springfield.*
*Mark E. Burnham, ... *Garland.*
Louville Curtis, ... *Bowdoinham.*
*Roland Curtis, M. D., Physician, ... *Bowdoinham.*
*Samuel C. Moore, ... *Cherryfield.*
Charles F. Osgood, Farmer, ... *Garland.*
*William H. Reed, ... *Springfield.*
George I. Trickey, Lawyer, ... *Caribou.*
Manley H. Whitehouse, ... *Orrington.*
Edward R. Wingate, Manufacturer, ... *Cherryfield.*
William I. Wood, Lawyer, ... *Corinna.*

1875.

Gustavus Bellows, Farmer, ... *Freedom.*
Leander H. Blossom, Farmer, ... *Turner.*
John H. Carver, Clerk, 9 North Union St., ... *Somerville, Mass.*
William B. Dole, Mechanic, ... *Bangor.*
George N. Gage, Physician, ... *East Washington, N. H.*
*Benson H. Ham, Farmer, ... *Bridgewater, Mass.*
Alton A. Jackson, M. D., Physician, ... *East Jefferson.*
Manley Jackson, Organ and Sewing Machine Business, ... *Chelsea, Mass.*
Freeland Jones, Real Estate and Insurance Agent, ... *Caribou.*
Ora Oak, Merchant, ... *Perris, Calif.*
Sidney S. Soule, Farmer, ... *Freeport.*
*George W. Spratt, ... *Bangor.*
Charles H. Spring, Wool Grower, *Buenos Ayres, Argentine Republic, S. A.*

1876.

Francis H. Bacon, Architect, 96 Washington Street, ... *Boston, Mass.*
Russell A. Carver, ... *Dixfield.*
Frank P. Gurney, Farmer, ... *Brookhaven, Miss.*
*Frank A. Hazeltine, Farmer, ... *Dexter.*
Eugene L. Hopkins, Wholesale Fruit Dealer, ... *Seattle, Wash.*
James W. Linnell, Farmer, ... *Exeter.*
George J. Moody, Lawyer, ... *Montesano, Wash.*
Webster Mudgett, ... *Albion.*
Edward B. Pillsbury, Manager Postal Telegraph Company, *Boston, Mass.*
Randall H. Rines, Merchant, (Rines Brothers), ... *Portland.*
Walter F. Robinson, Civil Engineer, Great Northern Railroad, *Helena, Mont.*
Edward C. Shaw, with American Watch Company, ... *Waltham, Mass.*
Frank E. Southard, Lawyer, ... *Augusta.*
Frank P. Whitaker, Physician, ... *Hermon.*

*Deceased.

1877.

Charles F. Andrews, ... *Biddeford.*
Frederick S. Bunker, B. A., City Hospital, ... *Boston, Mass.*
*Edson C. Chase, ... *Stillwater.*
William W. Dow, Printer, ... *Rehoboth, Mass.*
James T. Emery, ... *Stillwater.*
Charles M. Freeman, ... *Portland.*
*Frank H. Goud, Clerk ..... *Fort Fairfield.*
Austin I. Harvey, M. D., Physician, ... *Newport.*
Menzies F. Herring, Editor and Publisher, ... *Dexter.*
Ardean Lovejoy, ... *Orono.*
Fred B. Mallett, Lumbering Business, ... *Minneapolis, Minn.*
Fred L. Partridge, ... *Stockton.*
Fred H. Pullen, First Officer Ocean Steamer .....
*Frank E. Reed, ... *Springfield.*
Woodbury D. Roberts, Merchant, ... *Cheney, Wyo.*
Thomas B. Seavey, Clerk, ... *Chicago, Ills.*
Henry C. Townsend, Earmer, ... *Fort Fairfield.*
Clara E. Webb, Teacher, ... *Unity.*
Fred S. Wiggin, Farmer, ... *Presque Isle.*
William B. Whitney, ... *Iowa.*

1878.

Charles H. Benjamin, M. E., Professor of Mechanical Engineering, Case School of Applied Science, ... *Cleveland, Ohio.*
Eugene M. Berry, ... *Sumner.*
*Nathaniel A. Crocker, ... *West Enfield.*
Charles C. Elwell, C. E., Division Engineer Baltimore and Ohio Railroad, *Philadelphia, Pa.*
Howard H. Hartwell, ... *Montpelier, Vt.*
John E. Haynes, ... *South America.*
Fred H. Hinckley, Clerk in United States Land Office, ... *Eureka, Nev.*
Richard S. Howe, ... *Fryeburg.*
Samuel C. Jameson, Merchant, ... *Providence, R. I.*
William S. Jameson, Dealer in Sugar Machinery, ... *Guadalajara, Mex.*
Edgar H. Lancaster, Mechanic in Railroad Shop, ... *Old Town.*
*Alvra W. Leathers, ... *Dover.*
James Lunt, ... *Bangor.*
Herbert A. Mallett, Lumberman, ... *Stillwater, Minn.*
Silas H. Miller, ... *Fairplay, Colo.*
Frank J. Perkins, Merchant, ... *Old Town.*
Charles F. Plumly, Merchant, ... *Lincoln.*
John O. Richardson, Merchant, ... *Old Town.*
A. Judson Small, ... *North Lubec.*

*Deceased.

Albert H. Stewart, Piano Regulator,.....*Boston, Mass.*
Edson Warriner, Watchmaker and Jeweler,.....*Fryeburg.*
*Erastus G. Weeks, Merchant, ...*Jefferson.*

1879.

Daniel Allison,.....*San Francisco, Calif.*
Arthur P. Brown, Principal High School,.....*Bradley.*
Benjamin V. Carver, Machinist,.....*Hartford, Conn.*
Frank Clergue, Lawyer,.....*Bangor.*
Byron H. Cochrane,.....*Woonsocket, R. I.*
Fred A. Colburn, Clerk and Scaler,.....*Stillwater, Minn.*
James W. Cousens, Merchant and Postmaster,.....*Stillwater.*
John A. Curtis, Civil Engineer,.....*Delta, Colo.*
George A. Dustin, Machinist and Trader,.....*Dexter.*
Loomis F. Goodale, C. E., Chief Engineer, Saint Louis, Keokuk and Northwestern, Chicago, Burlington and Kansas City Railway, *St. Joseph, Mo.*
Edwin A. Hawes, Mechanic,.....*Ontario, Calif.*
*Edwin C. Johnson, ...*Gorham.*
John N. Knapp, ...*Bradley.*
Oliver S. Jones, Farmer, ...*Corinna.*
Albert Y. Merrill, Lawer, Judge of Probate, ...*Aitkin, Minn.*
Asa C. Morton, Clerk, ...*Bangor.*
Harry W. Peakes, Merchant, ...*Charleston.*
David S. Plummer, Book-keeper,.....*Boston, Mass.*
*Eugene G. Smith, ...*Richmond.*
William N. Titus, Lawyer, Boston, ...Residence, *Woburn, Mass.*
Howard E. Webster, Lumberman, ...*Orono.*
Arthur L. Wellington, ...*Covina, Calif.*
Charles M. Wilson, ...*San Francisco, Calif.*

1880.

Charles M. Allen, M. A., Teacher of Chemistry, Pratt Institute, *Brooklyn, N. Y.*
Edwin N. Atwood, ...*Portland.*
Granville Austin, Salesman, ...*Boston, Mass.*
Sylvester A. Brown, Clerk, ...*Boston, Mass.*
*Ada M. L. Buswell, Teacher, ...*Minneapolis, Minn.*
Charles E. Cheney, Piano Tuner, ...*Portland.*
Woodbury F. Cleveland, M. D., Physician,.....*Eastport.*
Samuel H. Dyer, ...*Portland.*
Osgood E. Fuller, with Akron Felt Works, ...*Akron, Ohio.*
Harry H. Goodwin, Editor,.....*Dension, Tex.*
John B. Horton, Dealer in Steam and Gas Supplies, ...*Lincoln, Neb.*

*Deceased.

Daniel S. Jones, Watchmaker and Jeweler, ... *Veteran, Colo.*
*Charles W. Nash, ... *Addison.*
Willis L. Oak, Clerk, ... *Presque Isle.*
Fred W. Powers, President Forest City Creamery, ... *Portland.*
Emily I. Ramsdell, Photographer, ... *Bangor.*
*Mortier C. Randall, ... *Stillwater.*
William J. Rich, Chemist, Cambria Iron Company, ... *Johnstown, Pa.*
Charles S. Simpson, Civil Engineer and Country Surveyor, *Florence, Wis.*
Frank A. Spratt, B. A., Principal, High School, ... *Olneyville, R. I.*
Daniel Webster, Express Agent, ... *Bangor.*
Arthur Wentworth, ... *Orrington.*

1881.

Henry W. Adams, Lumberman, ... *Wisconsin.*
*Lorin T. Boynton, ... *Ashland.*
Charles P. Chandler, Machinist ..... *New Gloucester.*
*Frank P. Fessenden, ... *South Bridgton.*
Archy S. Gee, Clerk, ... *Minneapolis, Minn.*
George W. Holmes, Merchant ..... *Norway.*
John F. Horne, Shoe Manufacturer, ... *Auburn*
Benjamin L. Johnson, ... *Portland.*
Edward C. Luques, Broker, ... *Biddeford.*
Charles S. Macomber, Lawyer, ... *Carrollton, Iowa.*
Charles S. D. Nichols, Farmer, ... *Hollis.*
James M. Nowland, Teacher, ... *Quincy, Mass.*
Charles C. Ross, Commercial Salesman ..... *St. Stephen, N. B.*
Clara Southard, (Mrs. Hammond), ... *Orono.*
*Charles P. Tidd, Telegraph Operator, ... *Forrest Green, Mo.*
Harry P. Tidd, Teacher, ... *Higginsville, Mo.*
William R. Tilden, Shoe Factory, ... *Campello, Mass.*
William A. Vinal, Scaler, ... *Ashland.*
William G. Wales, ... *Monticello, Iowa.*
Frank B. Weeks, Government Quartermaster's Office, *San Francisco, Calif.*
Flora Welch, Nurse, ... *Boston, Mass.*
George H. Wilson, Clerk, Government Storehouse, ... *Maricopa, Ariz.*

1882.

Joseph B. Bartlett, Farmer, ... *Ashland.*
Charles E. Chapin, Salesman ..... *Boston, Mass.*
Charles C. Dunn, Farmer, ... *Ashland.*
Charles W. Fenlason, ... *Woodland.*
*John J. Greenlaw, Merchant, ... *North Fryeburg.*
William H. Hatch, Grocer, ... *Lisbon.*
Wesley J. Jameson, Clerk, ... *St. Paul, Minn.*

*Deceased.

Frederick A. Kenniston, Salesman, ... *Brockton, Mass.*
Frederick O. Kent, ... *Bremen.*
Walter H. Nason, M. D., Physician, ... *Hampden.*
Atta L. Nutter, Principal Shaw School, ... *Boston, Mass.*
Parker J. Page, ... *Boston, Mass.*
*Henry K. Poole, ... *Bremen.*
Louis K. Tilley, Farmer, ... *Castle Hill.*

1883.

George R. Currier, Government Clerk, ... *Washington, D. C.*
Arthur T. Drummond, Farmer, ... *Sidney.*
William E. Emery, M. D., Physician, ... *Surry.*
Norman F. Kelsea, Clerk, ... *Brockton, Mass.*
Edwin P. Kendall, Farmer and Miller, ... *Bowdoinham.*
*Henry W. Longfellow, Clerk, ... *Machias.*
*Charles S. Murray, Teacher, ... *Chincutague, Va.*
George A. Rich, B A., on Editorial Staff, "*Journal*," ..... *Boston, Mass.*
Everett F. Rich, Clerk, Bangor Savings Bank, ... *Bangor.*
Ralph Starbird, Lumber Dealer, ... *San Francisco, Calif.*
Ralph R. Ulmer, Lawyer and Clerk of Court, ... *Rockland.*
Frank C. Webster, Clerk, American Express Company, ... *Lewiston.*
Frank G. Webster, Clerk, ... *Bangor.*
Lewis H. White, M. D., Physician, ... *Lincoln Center.*

1884.

Edward S. Abbott, M. D., Physician, ... *Bridgton.*
Edward M. Bailey, Merchant, ... *Bangor.*
Joseph B. Bartlett, ... *Nottingham, N. H.*
William A. Berry, ... *Hampden.*
James A. Dunning, ... *Stockton, Calif.*
Freeland Ellis, Clerk, ... *Worcester, Mass.*
Eugene E. Folsom, Machinist, American Watch Company, *Waltham, Mass.*
Evie M. Hamblen, Teacher, ... *Frankfort.*
Robert S. Leighton, ... *Steuben.*
*Gilbert Longfellow, Jr., ... *Machias.*
Cephas R. Moore, Merchant and Postmaster, ... *Anson.*
William R. Pattangall, Manager Granite Company, ... *Machiasport.*
Robert C. Patterson, Assistant Cashier Great Northern Railroad, *St. Paul, Minn.*
Charles S. Pendleton, Farmer, ... *Elmore, Minn.*
Herbert L. Rich, M. A., Instructor in Natural Science, Lassell Seminary, *Auburndale, Mass.*
Flora M. Ricker, (Mrs. P. J. Page), ... *Boston, Mass.*
Warren J. Ridley, Conductor, ... *South Boston, Mass.*

*Deceased.

Elmer A. Savage, Manager Herenden Manufacturing Company, *Milwaukee, Wis.*
Mertie Sawyer, ... *Hampden.*
Charles F. Smith, Real Estate Dealer, ... *Boston, Mass.*
*Horace G. Trueworthy, ... *Orono.*
*Jotham Whipple, Jr., ... *Solon.*

1885.

James W. Bishop, Farmer, ... *Milo.*
Frederick H. Butler, C. E., Civil Engineer, Bangor and Aroostook Railroad, ... *Hampden.*
John I. Chase, Clerk, ... *Los Angeles, Calif.*
Harry W. Davis, Banker, ... *Church's Ferry, North Dakota.*
Fred W. Dickerson, ... *Belfast.*
Samuel W. Hill, Seaman, ... *Machias.*
Willard A. Libby, Clerk, ... *Denver, Colo.*
*Frank E. Manter, ... *Milo.*
Dennis D. Merrill, Steam Laundry, ... *Auburn.*
Carl H. Prince, Farmer, ... *Turner.*
Elisha C. Vose, U. S. Weather Observer and Journalist, ... *Chicago, Ills.*

1886.

Eugene C. Bartlett, ... *Bridgewater, Mass.*
Charles L. Libby, Superintendent Tool Works, ... *Bridgeport, Conn.*
Charles H. Merriam, Lawyer, ... *Spokane, Wash.*
Dudley W. Moor, Jr., Real Estate Dealer, ... *Toledo, Ohio.*
Harry E. Powers, Machinist, ... *Richmond.*
Harold E. Trueworthy, Farmer, ... *Houlton.*

1887.

Alton D. Adams, Manager Commercial Electric Company, *Indianapolis, Ind.*
John W. Allen, ... *Riverside, Calif.*
Alice Benjamin, ... *Oakland.*
Irving M. Clark, Civil Engineer, ... *Seattle, Wash.*
Jennie L. Dority, ... *Wells.*
*William J. Harris, ... *Groton, Mass.*
Austin D. Houghton, Superintendent Industrial Department, Clark University, ... *Atlanta, Ga.*
James S. Kennedy, ... *Ludlow.*
*Fred H. Kirkpatrick, ... *Bangor.*
William L. Perham, ... *Paris.*
Wm. P. Sherburn, ... *Dover.*
Frank L. Tucker, Farmer, ... *Andover, Mass.*

*Deceased.

Charles W. Wentworth, Lawyer,.....*North Windham.*
Rodney A. B. Young,.....*Baltimore, Md.*
Alfred S. Ruth, Resident Engineer, P. S. & G. H. R. R., *Summit, Wash.*

1888.

Charles W. Breed, Clerk,.....*Philadelphia, Pa.*
Albion H. Buker,.....*Rockland.*
James K. Chamberlain, Sanitary Engineer,.....*Guilford.*
*Frank P. Collins,.....*Fort Fairfield.*
Fred T. Drew,.....*Orono.*
George K. Hagerthy,.....*South Hancock.*
Edwin B. Lord, Printer and Publisher,.....*Stillwater.*
Alphonso F. Marsh, Druggist,.....*Old Town.*
Frank J. Page,.....*Great Works.*
Henry F. Perkins, Mechanic,.....*Oakland.*
Nathan A. Ring, Manufacturer,.....*Orono.*
Charles C. Rolfe, Teacher and Farmer,.....*Maysville Center.*
Abram W. Sargent,.....*New York.*
Joseph S. True, Merchant,.....*Intervale.*
Ernest H. Turnbull,.....*St. John, N. B.*

1889.

Benjamin R. Clark, Merchant,.....*Haverhill, Mass.*
George G. Fernald, Grain Dealer,.....*Wilton.*
*Arthur M. Folsom,.....*Old Town.*
Charles B. Gould, Clerk,.....*Bangor.*
Elmer E. Greenwood, Resident Engineer, K. & M. Railway Company, *Peabody, West Va.*
Temple Grosvenor,.....*Canterbury, N. B.*
Lewis F. Johnson,.....*New Haven, Conn.*
Cora A. Leavitt, (Mrs. Frank L. Parker),.....*Norridgewock.*
John E. Littlefield, Lumberman,.....*Bangor.*
Albert L. Lyford, Principal Commercial Department, Maine Wesleyan Seminary,.....*Kent's Hill.*
*Maude A. Matthews,.....*Stillwater.*
Clara Rogers, Teacher,.....*Hampden.*
William H. Sargent, Book-keeper,.....*South Brewer.*
Frederick L. Thompson, Instructor in Physical Culture, *Philadelphia, Pa.*
Norman Tripp, Travelling Salesman,.....*Helena, Mont.*
Fred H. Webb, Mechanical Engineer,.....*Skowhegan.*
Ambrose H. White, with Otis Brothers & Company,.....*Arlington, N. Y.*

1890.

Carroll D. Cargill,.....*Livermore Falls.*
Charles A. Dillingham, Merchant.....*Old Town.*

*Deceased.

Allie M. Hastings,.....*Rockland.*
George W. Hodgdon,.....*Rumford.*
Leon H. Jones, Draughtsman.....*Boston, Mass.*
Irving C. Kenniston, Sheep Raiser,.....*Belmont, Ariz.*
John W. Lewis, Clerk,.....*Newburyport, Mass.*
Herbert B. Rowell,.....*St. Paul, Minn.*
Gilman H. Webber, Book-keeper,.....*Boston, Mass.*

1891.

Arthur W. Andrews,.....*Saco.*
Leslie A. Boadway, Merchant,.....*Madison.*
James W. Davis, Civil Engineer, L. L. & M. S. Railway,...*La Porte, Ind.*
Henry E. Fernald,.....*Brunswick.*
Robert W. Fuller, Principal Grammar School,.....*Natick, R. I.*
William A. Harlow,.....*Milford.*
Edwin W. Hodgdon, Druggist,.....*Whitinsville, Mass.*
Byron C. Hodgkins, Clerk.....*Stillwater.*
Joseph M. Jackson, Electrical Engineer,.....*Boston, Mass.*
Charles H. Maling, Book-keeper,.....*Brewer.*
Edwin R. Merrill, Draughtsman,.....*Columbus, Ohio.*
Aldert M. Miller, Merchant,.....*Rockland.*
*William A. Morris,.....*Bangor.*
Jay P. Norton,.....*York Corner.*
Arthur M. Otis,.....*Grafton.*
Robert M. Packard,.....*Rockland.*
Clifford I. Pillsbury,.....*Rockland.*
Clarence Scott,.....*Old Town.*
Leonard A. Tirrill, Draughtsman,.....*Lynn, Mass.*
Alden P. Webster,.....*Orono.*

1892.

George A. Bailey,.....*Dexter.*
Frank A. Bourne, Student of Architecture, Institute of Technology, *Boston, Mass.*
Bertrand J. Clergue, with Penobscot Pulp and Paper Company,..*Veazie.*
Edwin T. Clifford,.....*Leeds.*
Charles E. Cobb,.....*Patten.*
George C. Hamilton,.....*Dexter.*
Ernest S. Hatch,.....*Lovell Centre.*
Jacob F. Hersey,.....*Patten.*
Willard E. McKechnie,.....*Princeton.*
Calvin H. Neally, Teacher, Business College,.....*Portland.*
Harry M. Prentiss, Postal Clerk,.....*Belfast.*
Job Prince,.....*South Turner.*

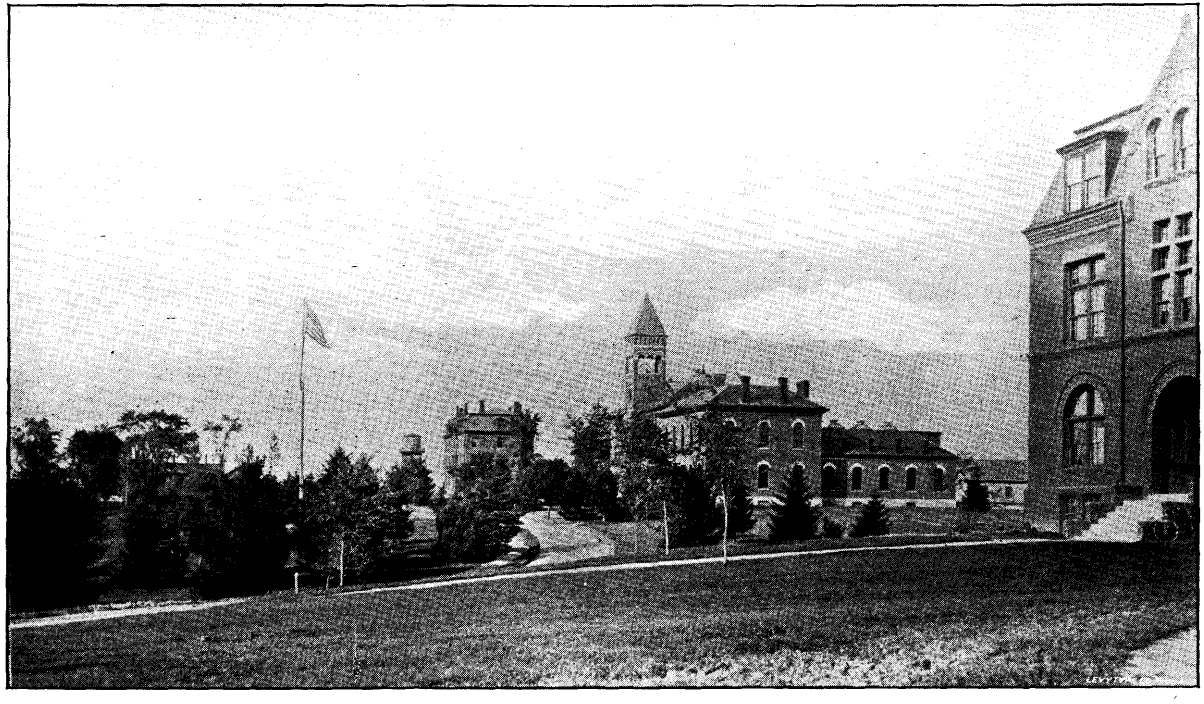
*Deceased.

George F. Rich, Lawyer,.....*Berlin, N. H.*
Harry S. Thompson,.....*Dexter.*
Laforest C. Williams,.....*Athens.*

1893.

*James A. Alexander,.....*Richmond.*
Abbott E. Alford, New England Sulphite Digester Company,
Howland.
Timothy R. Atkinson, Civil Engineer,.....*Rumford Falls.*
Clarence L. Chapman,.....*Newburgh.*
Walter Cooper,.....*Belfast.*
Herbert C. Foss,.....*College Hill, Mass.*
Edwin T. Hamlin,.....*Ithaca, N. Y.*
William C. Hammett, U. S. Military Academy,.....*West Point, N. Y.*
Charles I. Haynes,.....*Bangor.*
John Jerrard,.....*Bangor.*
Chesley M. Johnston,.....*College Hill, Mass.*
John R. Morris,.....*Bangor.*
Harry O. Robinson,.....*Bangor.*
Lizzie L. Smith,.....*Veazie.*
Ralph K. Smith, Journalist,.....*Boston, Mass.*
Pearly R. Wilson,.....*Solon.*
Thomas J. Young,.....*Athens.*

*Deceased.

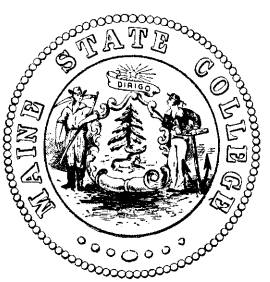


VIEW FROM THE PRESIDENT'S HOUSE.

CATALOGUE

OF THE

Maine State College



1893-1894

ORONO, MAINE

AUGUSTA
Burleigh & Flynt, Printers to the State
1894

TABLE OF CONTENTS.

CALENDAR.

FALL TERM, 1893.

August	29, Tuesday,	Entrance examinations begin.
August	29, Tuesday,	Fall term begins.
October	6, Friday,	Annual military encampment.
October	13, Friday,	
November	28, Tuesday,	Semi-annual meeting of the Board of Trustees.
November	30, Thursday,	Thanksgiving recess.
December	3, Sunday,	
December	19, Tuesday,	Term examinations begin.
December	21, Thursday,	Term ends.

SPRING TERM, 1894.

February	5, Monday,	Before-term examinations begin.
February	7, Wednesday,	Spring term begins.
February	22, Thursday,	Washington's birthday.
April	19, Thursday,	Fast day.
May	9, Wednesday,	Arbor day.
May	30, Wednesday,	Decoration day.
June	1, Friday,	Sophomore prize declamations.
June	2, Saturday,	Senior vacation begins.
June	6, Wednesday,	Field day of the agricultural department.
June	16, Saturday,	Junior exhibition.
June	17, Sunday,	Baccalaureate sermon.
June	18, Monday,	Public report of the Examining Committee.
June	18, Monday,	Exhibition drill.
June	18, Monday,	Commencement oration.
June	19, Tuesday,	Annual meeting of the Board of Trustees.
June	19, Tuesday,	Receptions by the literary societies.
June	19, Tuesday,	Reception by the President.

June	20, Wednesday,	Commencement.
June	20, Wednesday,	Commencement dinner.
June	20, Wednesday,	Meeting of the Alumni Association.
June	20, Wednesday,	Commencement concert.
June	21, Thursday,	Class day exercises.
June	21, Thursday,	Entrance examinations begin.

FALL TERM, 1894.

September	3, Monday,	Before-term examinations begin.
September	4, Tuesday,	Entrance examinations begin.
September	5, Wednesday,	Fall term begins.
November	27, Tuesday,	Semi-annual meeting of the Board of Trustees.
November	29, Thursday,	Thanksgiving recess.
December	2, Sunday,	
December	18, Tuesday,	Term examinations begin.
December	20, Thursday,	Term ends.

SPRING TERM, 1895.

February	4, Monday,	Before-term examinations begin.
February	6, Wednesday,	Spring term begins.

THE MAINE STATE COLLEGE.

ESTABLISHMENT.

By an Act of Congress, approved July 2, 1862, it was provided that there should be granted to the several States public lands, "thirty thousand acres for each Senator and Representative in Congress," from the sale of which there should be established a perpetual fund "the interest of which shall be inviolably appropriated, by each State which may take and claim the benefit of this act, to the endowment, support, and maintenance of at least one college where the leading object shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, in such manner as the legislatures of the States may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life." The Act forbade the use of any portion of the aforesaid fund, or of the interest thereon, for the purchase, erection, or maintenance of any building or buildings; and the several States claiming and taking the benefit of the provisions of the Act were required, by legislative assent previously given, "to provide within five years not less than one college" for carrying out the purposes of the Act.

In 1863, the State accepted this grant, and by an Act of the Legislature, passed in 1865, Samuel F. Perley, Hannibal Hamlin, and fourteen other persons were "constituted a body politic and corporate, by the name of the Trustees of the State College of Agriculture and the Mechanic Arts, with power to establish and maintain such a college as is provided for in the act of Congress, and they were made entitled to receive the income accruing "from the funds granted to the State by the Act of Congress aforesaid." To the Trustees was granted the right to receive and hold any donations or benefactions, to select the professors and other officers of the college, to establish the conditions for admission, to lay out courses of study, to grant degrees, to limit the number

of students, and to exercise other usual powers and privileges.

To the Governor and Council was granted the power, "at all times, by themselves, or such committee as they shall appoint, to examine into the affairs of the College, and the doings of the trustees, and to inspect all their records and accounts, and the buildings and premises occupied by the College."

It was provided that the College should teach such studies, within the limitations of the Act of Congress, as the facilities would permit. Military instruction was explicitly ordered and the adjutant general of the State was authorized to furnish arms and equipment for military drill, and directed to "furnish to the College a United States flag."

Tuition was made free, and the trustees and all persons employed by them, were directed to make the expenses of students as small as possible.

ENDOWMENT.

The State of Maine received, under the Act of Congress, two hundred and forty thousand acres of public land, from which the College has realized an endowment fund of about $131,000. To this has been added $100,000, by the bequest of Abner Coburn of Skowhegan, who was for many years president of the Board of Trustees.

The town of Orono contributed $8,000, and the town of Old Town $3,000 for the purchase of what is now the site on which the college buildings stand and the college farm. The State has appropriated about $250,000 mostly for the material equipment.

Under an Act of Congress approved March 2, 1887, the College receives $15,000 annually for the maintenance of its experimental work in agriculture. This is in charge of the department known as the Agricultural Experiment Station.

Under an Act of Congress approved August 30, 1890, the College received for its more complete endowment and maintenance "the sum of fifteen thousand dollars for the year ending June thirtieth, eighteen hundred and ninety." The Act provided that this amount should be increased by one thousand dollars each year until the annual appropriation should reach twenty-five thousand dollars and then remain at this sum.

THE BOARD OF TRUSTEES.

	Term Expires.
THE HON. HENRY LORD, *President*, Bangor,	April 17, 1894.
THE HON. WILLIAM T. HAINES, B. S., LL. B., *Secretary*, Waterville,	Dec. 30, 1895.
RUTILLUS ALDEN, Winthrop,	April 17, 1895.
THE HON. CHARLES P. ALLEN, B. S., Presque Isle,	April 17, 1896.
BENJAMIN F. BRIGGS, Auburn,	April 17, 1897.
GREENVILLE J. SHAW, Hartland,	April 17, 1898.
GEN. RUSSELL B. SHEPHERD, Skowhegan,	April 17, 1899.
THE HON. ARTHUR L. MOORE, B. S., Limerick,	April 17, 1900.

EXECUTIVE COMMITTEE.

TRUSTEES LORD AND HAINES.

TREASURER.

PROF. GEORGE H. HAMLIN, Orono.

EXAMINING COMMITTEES.

COMMITTEE ON THE FINAL EXAMINATIONS.

His Excellency HENRY B. CLEAVES.
The Rev. CHARLES F. ALLEN, D. D.
The Hon. SAMUEL W. MATTHEWS, M. A.

COMMITTEE ON THE JUNIOR EXHIBITION.

The Rev. PEARLEY J. ROBINSON, B. D.
CHARLES. J. DUNN, Esq.
The Rev. FRANK C. ANDREWS, M. A.

COMMITTEE ON THE PRENTISS DECLAMATION PRIZE.

The Rev. NATHAN S. HILL, M. A.
The Rev. WILBUR F. HOLMES, M. A.
The Rev. PEARLEY J. ROBINSON, B. D.

COMMITTEE ON THE LIBBEY PRIZE.

Prof. WHITMAN H. JORDAN, M. S.

THE EXPERIMENT STATION COUNCIL.

TRUSTEE RUTILLUS ALDEN,.....Winthrop.
PROFESSOR WALTER BALENTINE, M. S., ...Orono.
TRUSTEE BENJAMIN F. BRIGGS, ...Auburn.
PRESIDENT ABRAM W. HARRIS, Ph. D., *President*, ...Orono.
PROFESSOR FRANCIS L. HARVEY, Ph. D., ...Orono.
DIRECTOR WHITMAN H. JORDAN, M. S., *Secretary*, ...Orono.
REPRESENTATIVE D. H. KNOWLTON, M. A.,
State Pomological Society.....Farmington.
REPRESENTATIVE B. WALKER McKEEN,
State Board of Agriculture .....Fryeburg.
TRUSTEE ARTHUR L. MOORE, B. S. .....Limerick.
PROFESSOR WELTON M. MUNSON, M. S., ...Orono.
PROFESSOR FREMONT L. RUSSELL, V. S., ...Orono.
REPRESENTATIVE I. O. WINSLOW, M. A.,
Maine State Grange.....St. Albans.

THE FACULTY.

ABRAM W. HARRIS, Ph. D., ... Campus.
President.

GEORGE H. HAMLIN, C. E., ... Main Street.
Professor of Civil Engineering.

ALFRED B. AUBERT, M. S., ... Campus.
Professor of Chemistry.

ALLEN E. ROGERS, M. A., ... College Street.
Professor of History, Logic, and Civics.

WALTER BALENTINE, M. S., ... Campus.
Professor of Agriculture and Agriculturist of the Experiment Station.

WALTER FLINT, M. E., ... Bennoch Street.
Professor of Mechanical Engineering.

WHITMAN H. JORDAN, M. S., ... Main Street.
Director of the Experiment Station.

JAMES M. BARTLETT, M. S., ... College Street.
Chemist of the Experiment Station.

FRANCIS L. HARVEY, Ph. D., ... Forest Avenue.
Professor of Natural History and Entomologist of the Experiment Station.

LUCIUS H. MERRILL, B. S., ... Forest Avenue.
Chemist of the Experiment Station.

JAMES N. HART, C. E., ... North Main Street.
Professor of Mathematics and Astronomy.

HOWARD S. WEBB, B. M. E., ... North Main Street.
Instructor in Shop-work.

FREMONT L. RUSSELL, V. S., ... College Street.
Veterinarian of the Experiment Station.

FRED P. BRIGGS, B. S., ...Main Street.
Assistant in Natural History.

NATHAN C. GROVER, B. C. E., ...Main Street.
Assistant in Civil Engineering.

HARRIET CONVERSE FERNALD, M. S., ...North Main Street.
Librarian.

WELTON M. MUNSON, M. S., ...Bennoch Street.
Professor of Horticulture and Horticulturist of the Experiment Station.

HORACE M. ESTABROOKE, M. S., M. A., ...Main Street.
Professor of Rhetoric and Modern Languages.

JAMES S. STEVENS, Ph. D.....North Main Street.
Professor of Physics.

MARK L. HERSEY, M. A., ...Main Street.
Second Lieutenant 9th U. S. Infantry,
Professor of Military Science and Instructor in Physical Culture.

GILBERT M. GOWELL, M. S., ...Campus.
Professor of Animal Industry.

DAVID WILDER COLBY, B. S., ...Campus.
Assistant in Chemistry.

DAVID W. TRINE, B. S., ...Head House.
Assistant in Horticulture.

HARRIS P. GOULD, ...Head House.
Assistant in Horticulture in the Experiment Station.

HOWARD S. WEBB, B. M. E., ...Wingate Hall.
Secretary and Registrar.

ADMISSION.

Applicants for admission to the College must pass the required examinations, or present satisfactory certificates of fitness, and file with the Treasurer a bond for $150 signed by two bondsmen, as security for the payment of dues to the College. No distinction is made in regard to sex, or place of residence. Entrance may be made at any time. Candidates for advanced standing, unless they present certificates of fitness, are examined in the preparatory studies in addition to those previously pursued by the classes they propose to enter, or in other equivalent studies.

A student who has accomplished half or more of the preparatory course may be examined on that part, and receive credit therefor. In such a case, he will be examined, in any subsequent year in which he may present himself, only on those studies on which he has not already passed. But no credit will be given unless the candidate is able to pass on at least half of the preparatory course.

As the required work of the College includes an unusually large amount of Mathematics, and since success in the engineering courses requires the ability to make easy use of the higher mathematics, it is desirable that students preparing for admission to the College, be subjected to the most rigorous drill in this subject.

Attention is called to the need of careful preparation in English. This should include the rapid reading of numerous standard works of fiction, the careful reading of other standard works, the writing of themes based upon this reading and the frequent writing of themes on simple and familiar subjects, with exercises in punctuation, capitalization, etc.

Persons who are not candidates for a degree, and who wish to take special studies, will be permitted to do so upon giving satisfactory evidence that they are prepared to take the desired studies. If they subsequently desire to become candidates for a degree, or to take a regular course, they may be required to pass the entrance examinations.

No examinations are required for admission to the winter short courses or summer courses

ADMISSION BY EXAMINATION.

Examinations are held at the college, beginning on the day before the opening of each term, and on the day after commencement. Examinations are also held in each county of the State and in other places when desired. The examinations in places other than the college are held on the day after commencement, and persons desiring examinations at such places must notify the President of the college not later than June 1.

To save expense to candidates, special local examinations will be given when satisfactory arrangements can be made. Upon request, questions will be sent to any principal, or other satisfactory person who will consent to conduct the examination for the accommodation of the candidate. The questions are to be submitted under the usual restrictions of a written examination, and the answers returned to the college accompanied by the indorsement of the examiner that the examination has been properly made. The student desiring to take advantage of this provision must secure the consent of the proper person to take charge of the examination, and make early request to the President of the college to have the questions sent.

The examinations will cover the following topics:

ARITHMETIC.—Simple and denominate numbers; ratio and proportion; common and decimal fractions; percentage; metric system of weights and measures; square root. A satisfactory treatment of these subjects may be found in Wentworth and Hill's, Greenleaf's, or the Franklin Arithmetic. It is important that definite ideas of the units of the metric system should be obtained. A thorough drill in mental arithmetic with a book like Colburn's is recommended.

ALGEBRA.—Fundamental operations; use of parentheses; factoring; highest common factor; lowest common multiple; fractions, simple and complex; simple equations, with one or more unknown quantities; involution of monomials and polynomials; evolution of monomials and polynomials and the cube root of numbers; the theory of exponents, with applications; radicals, including rationalization, imaginary quantities, properties of quadratic surds, square root of a binomial surd, and solution of equations containing radicals; quadratic equations; equations in the quadratic form; simultaneous quadratic equations; ratio and proportion; arithmetical progression; geometrical progression. A satisfactory treatment of topics may be found in Greenleaf's Elementary, Newcomb's, Wells' Academic or Wentworth's School Algebra.

PLANE GEOMETRY.—The first five books of Chauvenet's, Wells' or Wentworth's Geometry. The preparation should cover the solution of numerical exercises, the demonstration of original propositions, and the construction of geometrical figures in a neat and careful manner with dividers and ruler. The examination will include some propositions for original demonstration or construction.

POLITICAL GEOGRAPHY.—Location of continents, mountain ranges, peninsulas, isthmuses, islands, capes; location of oceans, bays, sounds, straits, lakes and rivers; location and boundaries of countries and states; location of important seaports, commercial cities and capitals; approximate latitude and longitude of important places.

PHYSICAL GEOGRAPHY.—Definition of terms; motions, form, size of the earth; magnetic action; physical features of the continents; relief forms; currents of air and water; volcanoes, earthquakes, geysers, etc.; forms of water; climate; drainage; tides; meteorology, clouds, rain, dew, etc.; glaciers and icebergs; races; metals and minerals; fauna and flora.

PHYSIOLOGY.—Cells and tissues, skeleton, muscles, blood and circulation, respiration, nutrition and digestion, lymphatic system, excretory organs, nervous system, special senses, hygiene.

ENGLISH.—Each candidate will be required to write a short essay upon a subject announced at the time of the examination. This essay will be expected to show a general familiarity with the works mentioned below, and will be examined with especial attention to accuracy of grammar, spelling, and punctuation. In 1894 subjects for this essay will be taken from two or more of the following works, candidates being required, however, to be prepared on all of them: Shakspere's Julius Cæsar and Merchant of Venice, Scott's Lady of the Lake, Arnold's Sohrab and Rustum, the Sir Roger de Coverley Papers in the Spectator, Macaulay's second Essay on the Earl of Chatham, Emerson's American Scholar, Irving's Sketch Book, Scott's Abbot, Dickens' David Copperfield.

In 1895, they will be taken from the following: Shakspere's Merchant of Venice and Twelfth Night, Milton's L'Allegro, Il Penseroso, Comus, and Lycidas, Longfellow's Evangeline, the Sir Roger de Coverley Papers in the Spectator, Macaulay's Essay on Milton and Essay on Addison, Webster's First Bunker Hill Oration, Irving's Sketch Book, Scott's Abbot.

In 1896, they will be taken from the following: Shakspere's Merchant of Venice and Midsummer Night's Dream, Milton's L'Allegro, Il Penseroso, Comus, and Lycidas, Longfellow's Evangeline, Macaulay's Essay on Milton, Webster's First Bunker

Hill Oration, DeFoe's History of the Plague in London, Irving's Tales of a Traveller, Scott's Woodstock, George Eliot's Silas Marner.

In 1897, they will be taken from the following: Shakspere's Merchant of Venice and As You Like It, Scott's Marmion, Longfellow's Evangeline, Burke's Speech on Conciliation with America, Macaulay's Life of Samuel Johnson, De Foe's History of the Plague in London, Irving's Tales of a Traveller, Hawthorne's Twice Told Tales, George Eliot's Silas Marner.

Each candidate will be required to criticise specimens of English given him at the time of the examination.

BOTANY.—In 1895, candidates will be examined in elementary botany. Any course will be satisfactory which brings the pupil into contact with plants. In schools possessing compound microscopes work should be done such as is presented in Bessey's Essentials of Botany, Arthur, Barnes and Coulter's Handbook of Plant Dissection, or Campbell's Structural and Systematic Botany. In case no compound microscopes are available such a text as Gray's Text Book, revised edition, should be used, as both recitation book and laboratory guide.

UNITED STATES HISTORY.—The voyages and discoveries of Columbus and of the other early navigators and adventurers; the circumstances that led to the founding of the different colonies; the causes, leading events, and results of the War of the Revolution; the Articles of Confederation and the causes leading to the adoption of our present Constitution; the extent of the United States at the close of the Revolution and additions made to our national territory since; the National and State governments; the causes and results of the second war with England, and of the war with Mexico; the causes, leading events and results of the War of the Rebellion; history of the United States since the close of this war.

ENGLISH GRAMMAR.—Definition of terms; formation of plural number and possessive case of nouns; inflection of pronouns; comparison of adjectives and adverbs; the agreement of verbs with their subjects, and of pronouns with their antecedents; the synopsis of the verb; the analysis of sentences; the application of the rules of syntax. Special attention should be given to punctuation and capital letters.

ADMISSION BY CERTIFICATES OF FITNESS.

Any preparatory school whose course of instruction covers the requirements for admission to the college, may be admitted to its list of approved schools. Application for such approval may be made by an officer of the school to the President of the college. It must be accompanied by a detailed statement of the course of study, or a catalogue of the school.

A committee of the college faculty will examine the course of study and the methods of instruction, and a representative of the college will visit the school. Upon the favorable report of the committee and visitor, the school will be placed upon the list of approved schools.

Candidates for admission to the college from these schools will be admitted to the Freshman Class upon the certificate of the principals, showing that the required studies have been completed satisfactorily. Certificates must be made out on blanks furnished by the college. Certificates will not be received in place of examinations for work of the Freshman year.

A school once entered upon the approved list, will remain there until the administration of the school is charged, or until the college give notice of unsatisfactory results. Upon a change of administration a new application for approval must be made.

APPROVED SCHOOLS.

The regulations in regard to approved schools were adopted a very short time before the publication of this catalogue. As a result the following list is very incomplete. Some schools have been rejected on account of insufficient courses, and some have not yet been approved because the college lacks information in regard to them. The following are the schools which have been approved.

BANGOR HIGH SCHOOL, *Bangor*,
Henry K. White, M. A., Principal.

BAR HARBOR HIGH SCHOOL, *Bar Harbor*,
Prescott Keyes, Jr., B. C. E., Principal.

BREWER HIGH SCHOOL, *Brewer*,
F. A. Freeman, M. A., Principal.

CORINTH ACADEMY, *East Corinth*,
A. W. Meserve, Principal.

DEERING HIGH SCHOOL, *Deering*,
Edgar H. Crosby, M. A., Principal.

EAST MAINE CONFERENCE SEMINARY, *Bucksport*,
Rev. A. F. Chase, M. A., President.

FOXCROFT ACADEMY, *Foxcroft*,
E. L. Sampson, M. A., Principal.

GREELEY INSTITUTE, *Cumberland Center*,
Fairfield Whitney, M. A., Principal.

HAMPDEN ACADEMY, *Hampden*,
Walter W. Poor, B. A., Principal

MILO HIGH SCHOOL, *Milo*,
George P. Gould, Principal.

ORONO HIGH SCHOOL, *Orono*,
S. H. Powell, Principal.

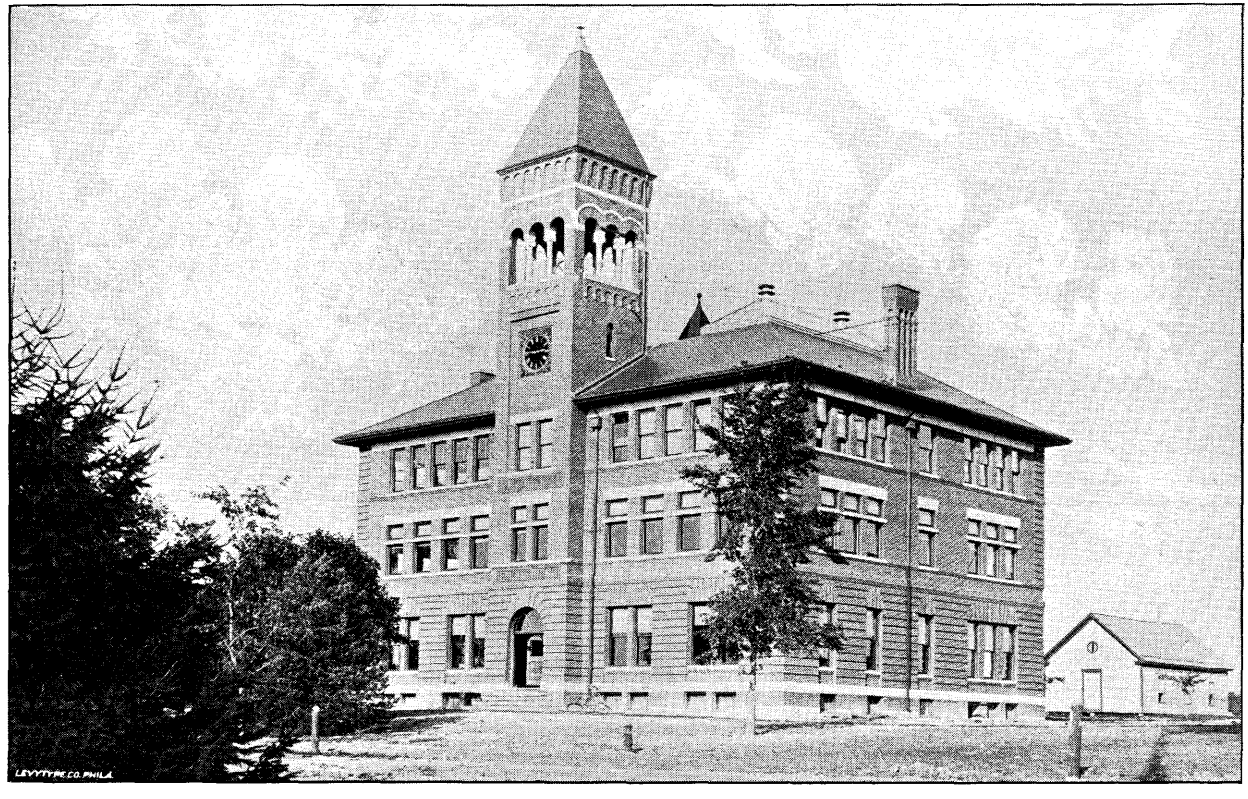
RICKER CLASSICAL INSTITUTE, *Houlton*,
A. M. Thomas, M. A., Principal.

THE MATERIAL EQUIPMENT.

WINGATE HALL.—The most conspicuous building on the Campus is Wingate Hall, a three-story brick structure rectangular in form, with a handsome tower furnished with a clock. It was designed specially for the departments of Civil and Mechanical Engineering, but is at present occupied in part by other departments. On the ground floor are two large designing rooms, recitation rooms, armory, instrument rooms, and private offices of the heads of departments. On the second floor is a handsome room occupied by the Young Men's Christian Association, the recitation rooms of the professors of mathematics, modern languages, and physics, an apparatus room, and two private offices. On the third floor are the large drawing rooms, well lighted, and said to be the best of their kind in New England. In the basement is the testing room in which are placed a Riehlé Bros. testing machine of 60,000 lbs. capacity, a cement testing machine, and a dynamo capable of supplying power for twenty-five lamps. The testing machines and the dynamos are attached by shafting to the engine used for forcing air throughout the building.

OAK HALL.—North of Wingate Hall is Oak Hall, a substantial three-story brick building used as a dormitory. It contains forty-eight rooms, is heated by steam, supplied with water, and lighted by electricity. Connected with Oak Hall by a corridor is the boarding house.

THE CHEMICAL LABORATORY.—The Chemical Laboratory, a two-story brick building, south of Wingate Hall, contains twelve large, well lighted and well arranged rooms devoted entirely to the needs of the department of Chemistry. On the first floor are the qualitative and quantitative laboratories, supplied with fume closets, water and gas; and the quantitative laboratory has in addition, steam cups for evaporation, and drying closets, and will soon be piped for suction, filtration, and for blast. On this floor are also a recitation room, a balance room, supplied with an assay balance and eight fine analy-



WINGATE HALL.

tical balances, a stock room containing all necessary apparatus, and the private office and laboratory of the Professor of Chemistry and his assistant. On the second floor are a large lecture room, with a smaller room used as a museum of chemistry, opening from it, the laboratory of mineralogy, equipped with the apparatus necessary for the determination of minerals, and a small room fitted with shutters and designed for use in spectroscopic and sugar work, gas analysis, water analysis, and original investigation. In this room is also an outfit for bacteriological examination of water, including two Reichert's microscopes, with six objectives, thermostats, and heating apparatus, and sterilizers for steam and dry heat, together with all necessary accessories. A room under the roof is fitted up for photographic work; adjoining this is a well equipped dark room. The photographic outfit includes a burnisher, copying camera, an 8x10 camera with Leiss anastigmatic lens for use in preparing topographical maps for engineers from photographs. In the basement is an assay laboratory supplied with large and small furnaces, one crusher, grinding plate, etc.

The department of Chemistry is well supplied with lecture apparatus for illustrative purposes, the latest additions being a large induction coil, and several of the newest forms of Hoffman's apparatus for the electrolytic decomposition and synthesis of liquids and gases.

The greater part of the chemical library, including the current and bound volumes of magazines, is kept in the Chemical Laboratory, in order to be more convenient of access to students for purposes of consultation.

COBURN HALL.—Directly south of the Chemical Laboratory is Coburn Hall, named in honor of Gov. Coburn. It is a brick building, three stories in height and finished in hard woods. On the first floor is an admirably equipped physical laboratory, a laboratory and a lecture room for the professor of agriculture, and the Library. The latter is a well lighted room about forty feet square, fitted up with the best modern library furniture. About 9,000 volumes, exclusive of pamphlets, are on its shelves, and the number of books is rapidly increasing. On the walls are portraits of Gov. Coburn and President Allen, and to these will soon be added that of President Fernald. On the second floor are the botanical and entomological laboratories and lecture rooms for the professor of Natural History and the professor of Civics. Directly over the Library is the Museum, a handsome room extending through two stories. The collections exhibited here, already large and constantly increasing, will soon outgrow their present quarters. On the third floor is the college chapel capable of seating four hundred persons.

MACHINERY HALL.—In the rear of the Chemical Laboratory is Machinery Hall, a wooden building 125 feet in length, and two stories in height, containing a foundry, forge shop, carpenter shop, machine shop, and tool room. The following partial list will give some idea of the equipment of the shops: Foundry—one 18-inch cupola furnace; six 50-lb. ladles; one 100-lb. ladle; one 200-lb. ladle; eight sets of slickers, trowels, rammers, shovels, bellows etc.; fifty flasks. Forge shop -eighteen power blast forges; champion hand forge; eighteen anvils; eighteen full sets of tongs and cutters; a fine set of heading tools; No. 3 Sturtevant blower: No. 5 Buffalo exhaust fan; blacksmith's vise; four blacksmith's 10-lb sledges; 6-lb. sledge. Machine shop—seven engine lathes; Gray planer; flather; Hendy shaper; No. 14 Brainard milling machine; Prentiss drill; slate sensitive drill; double head emery grinder; benches and vises for sixteen men in a division; full sets of taps, dies, reamers, mandrels, drills, milling cutters, wrenches, chucks, and lathe dogs. Carpenter shop—one Colburn saw bench, with attachments; one ordinary saw bench; jig saw; 20-inch planer; 12-inch buzz planer; two 16-inch pattern lathes, with two sets of turning tools, calipers, rests, etc.; little giant tool grinder; nineteen full sets of carpenter's tools, work benches, vises, and cases for tools. Power for running the machinery is furnished by a 10-horse-power steam engine.

THE EXPERIMENT STATION.—South of the Machinery Hall stands the Experiment Station, a two-story brick building of neat and pleasing appearance. On the ground floor are the reading room, reagent room, Directors' private laboratory, nitrogen room, and the laboratory used in the analysis of fertilizers, and in original investigation. On the second floor are the general office, the Director's private office, the bacteriological laboratory, and a storage room for books, pamphlets, etc. The building is heated by steam, lighted by gas, thoroughly equipped with apparatus, and is in every way a model of its kind.

THE HORTICULTURAL BUILDING.—East of the Experiment Station is the Horticultural Building, consisting of a head-house and three greenhouses. In the head-house are the office of the professor of horticulture, a working room and seed storage room, a photographing room, an attendant's room, and a room used for storage. The main greenhouse, 20 feet by 100 feet, is devoted to the use of the Experiment Station, and to the instruction of students. A second greenhouse, 20 feet by 80 feet, running parallel to the first, contains a potting room and a cold-forcing room. The third greenhouse is designed for investigations in plant nutrition. In the south end of this building is the conservatory.

THE DAIRY BUILDING.—The Dairy Building, 50 feet by 42 feet, contains a milk room, a butter room, a cheese room, an ice closet, a cheese curing room, a lecture room, the office of the professor of animal industry, and a laboratory. This building is supplied with a Sharpless Russian steam separator, a De Laval hand separator, a Babcock milk tester, a baby horse power, creamers, churns, butter workers, cream vats, cheese presses, cream tempering vats, weighing tank, and all other appliances necessary for teaching the most approved methods of butter and cheese making.

OTHER BUILDINGS.—In addition to the buildings already described, are nine others devoted to various college purposes. These include the President's house, the farm house, two large barns, the stable, two club houses, a chapter house, and a small gymnasium.

COURSES OF INSTRUCTION.

The Maine State College is a school of science and technology. It offers no instruction in the ancient languages, but gives a full list of courses in the natural and exact sciences, and in their technical applications. None of its courses are without a full complement of those literary and other studies which are especially useful for general training and culture.

The first year is common to all courses, and is largely taken up with courses in mathematics, natural science and English, which form the basis for all the future work. Extended courses in chemistry and physics are required of all students, and especial attention is given by students in all departments of the College to the study of English, modern languages and civics.

THE COURSES OF STUDY LEADING TO DEGREES are five, each requiring four years for completion.

The Scientific Course is the basis of the work of the College. From it the technical courses diverge. It is designed for those who seek the College for general culture and training. It differs from the usual College course in omitting Latin and Greek, and substituting French, German, English, and scientific studies. It is substantially identical with the course of the same name now found in the curriculum of the more progressive colleges of the country.

The Agricultural Course is designed for those who wish to become farmers, teachers or investigators in agricultural science, or editors of agricultural papers. In this course, agriculture is treated as a branch of technology. For those who wish practical rather than scientific training in agriculture, shorter courses are provided.

The Civil Engineering Course is designed for those who wish to become surveyors, railroad, highway, hydraulic, bridge or sanitary engineers.

The Mechanical Engineering Course is designed for those who wish to become electricians, managers of manufacturing plants, or general mechanical engineers.

The Chemical Course is intended for those who wish to become chemists, or to prepare themselves for courses in pharmacy or medicine.

NEW COURSES.—Three new courses will be open to students in the fall term of 1894. These will be known as the Electrical

Engineering Course, the Preparatory Medical Course, and the Pharmacy Course.

THE SHORT COURSES are provided as follows: the two years' course in agriculture, the one year course in agriculture, the training school of twelve weeks in general agriculture, the dairy school of four weeks, the training school in carpentry of twelve weeks, the course in library economy of one year.

THE EXTENSION COURSES, which may be pursued by those who cannot come to the College for residence, are as follows: The Farm Course, a series of lectures intended to be instructive rather than amusing, one, two, or three, each day for two weeks, by members of the Faculty of the agricultural department, at centers throughout the State where classes of sufficient size can be guaranteed.

The Reading Courses are planned as a guide to home study in the various lines of work in which the College is engaged. These courses cover English, modern languages, political economy, history, philosophy, the various natural sciences, agriculture, etc.

The Extension Lecture Courses consist of series of lectures, not less than five in number, upon closely related subjects. These lectures are for instruction, and are not to be confounded with the popular lectures which members of the Faculty frequently deliver.

SPECIAL COURSES.—The facilities of the College are open to those who show themselves fitted to take special courses in any of its lines of work.

DEGREES.—The scientific, the agricultural and the chemical courses, lead to the degree of Bachelor of Science; the civil engineering course leads to the degree of Bachelor of Civil Engineering; the mechanical engineering course to the degree of Bachelor of Mechanical Engineering. Three years after graduation, on presentation of a satisfactory thesis and proof of professional work or further study, the Bachelors receive the corresponding Master's degree.

STUDIES OF THE FRESHMAN YEAR, ALL COURSES.

Instructors.	Studies.	Fall Term.		Spring Term.	
		Weeks.	Hours.	Weeks.	Hours.
Prof. Hart	Solid Geometry—*Mathematics and Astronomy 1*	12	5		
	Algebra—*Mathematics and Astronomy 2*	4	5		
	Algebra—*Mathematics and Astronomy 2*			6	5
	Trigonometry—*Mathematics and Astronomy 3*			14	5
Prof. Estabrooke	Rhetoric—*Rhetoric and Modern Languages 1*	16	5		
	French—*Rhetoric and Modern Languages 4*			20	5
Prof. Rogers	General History—*Civics 1*	16	1	20	1
Mr. Briggs	Physiology—*Natural History 5*	16	5		
	Laboratory Physiology—*Natural History 6*	16	2		
Prof. Harvey	Botany—*Natural History 1*			20	5
	Laboratory Botany—*Natural History 2*			8	10
Mr. Briggs	Free-hand Drawing—*Natural History 14*	16	4		
Mr. Grover	Mechanical Drawing—*Civil Engineering 1*			12	10
Lieut. Hersey	Physical Culture—*Military Science and Tactics 5*	16	2½	20	2½
	Military Exercises—*Military Science and Tactics 1*	16	3	20	3

THE SCIENTIFIC COURSE.

This course is planned in the belief that the true beginning of a liberal education lies in a careful study and a thorough appreciation of our own language and literature. These, supplemented by courses in French and German, by careful training in Economics, History, and the elements of International, Constitutional, and Municipal Law, and by general scientific knowledge and attainments, furnish a substantial foundation for a broad and general culture.

This course is designed to prepare the student for those professions and callings which demand a broad general knowledge and a wider acquaintance with literature and history than is possible for those students to acquire whose time is chiefly devoted to the technical branches. It is believed to be especially adapted to the need of those who expect to engage in the teaching of the natural, social, or political sciences, or to engage in general business, banking or other large industries in executive or managing positions.

The main studies of this course furnish a broad foundation upon which the technical courses may rest, and the student upon graduation from the latter will have not only the highly specialized training fitting him for the practice of his profession, but also an acquaintance with those general studies which form a part of every liberal education.

Upon graduation the student receives the degree of Bachelor of Science; three years later, on proof of satisfactory advancement and on presentation of a thesis embodying original work or investigation, he receives the degree of Master of Science.

THE SCIENTIFIC COURSE.

For Freshman Year see page 28.

Instructors.	Studies.	Fall Term.		Spring Term.	
		Weeks.	Hours.	Weeks.	Hours.
	SOPHOMORE YEAR.				
Prof. Estabrooke	French—*Rhetoric and Modern Languages 5*	16	2		
	French—*Rhetoric and Modern Languages 6*			20	2
	German—*Rhetoric and Modern Languages 7*	16	3		
	German—*Rhetoric and Modern Languages 8*			20	2
Prof. Rogers	General History—*Civics 1*	16	1	20	1
Prof. Aubert	General Chemistry—*Chemistry 1*	16	5		
Mr. Colby	Analytical Chemistry—*Chemistry 5.*	16	4		
Prof. Aubert Mr. Colby	Analytical Chemistry—*Chemistry 6.*			20	16
Prof. Stevens	General Physics—*Physics 1*	16	5		
	Laboratory Physics—*Physics 2*	16	4		
	Heat, Optics, Magnetism and Electricity—*Physics 3*			20	5
	Laboratory Physics—*Physics 4*			20	4
Prof. Harvey	Cryptogramic Botany—*Natural History 3*	16	5		
	Laboratory Botany—*Natural History 4*	16	4		
Lieut. Hersey	Military Exercises—*Military Science and Tactics 1*	16	3	20	3
	JUNIOR YEAR.				
Prof. Hart	General Astronomy—*Mathematics and Astronomy 1*			10	5
Prof. Estabrooke	Anglo-Saxon—*Rhetoric and Modern Languages 2*	16	3		
	English Philology—*Rhetoric and Modern Languages 3*			20	3
	German—*Rhetoric and Modern Languages 9*	16	2		
	German—*Rhetoric and Modern Languages 10*			20	2
Prof. Rogers	Logic—*Logic and English Literature 1*	16	5		
	English Literature—*Logic and English Literature 2*			20	5
	Analysis of Authors and Historical Reading	16	3		
	Literary Work			20	3
Prof. Aubert Mr. Colby	(a) Analytical Chemistry—*Chemistry 9**	16	4		
Prof. Aubert Mr. Colby	(a) Chemistry—*Chemistry 9**			20	4
Prof. Stevens	Advanced Physics—*Physics 5*	16	2	20	2
	(b) Laboratory Physics—*Physics 4**	16	4	20	4
Prof. Harvey	Invertebrate Zoology—*Natural History 7*	16	5		
	Laboratory Zoology—*Natural History 8*			10	4
	Entomology—*Natural History—11*			10	5
Lieut. Hersey	Military Exercises—*Military Science and Tactics 1*	16	3	20	3
	Military Science—*Military Science and Tactics 2*	16	1	20	1

THE SCIENTIFIC COURSE—CONCLUDED.

Instructors.	Studies.	Fall Term. Weeks.	Fall Term. Hours.	Spring Term. Weeks.	Spring Term. Hours.
	SENIOR YEAR.				
Prof. Rogers	Psychology—*Logic and English Literature 3*	16	3	18	3
	Political Economy—*Civics 2*	16	5		
	Municipal Law—*Civics 3*	16	1	18	1
	Constitutional Law—*Civics 4*			14	5
	International Law—*Civics 5*			4	5
	Literary Work	16	2		
	Literary and Scientific Work			20	5
Mr. Colby	Mineralogy—*Chemistry 16*			6	5
Prof. Harvey	Comparative Vertebrate Zoology—*Natural History 9*	16	5		
	Laboratory Zoology—*Natural History 10*	16	4		
	Geology—*Natural History 13*			12	5
Prof. Munson	Plant Variation—*Horticulture 3*			10	3
	Landscape Gardening—*Horticulture 4*			10	3
Lieut. Hersey	Military Exercises—*Military Science and Tactics 1*	16	3	18	3
	Military Science—*Military Science and Tactics 3*	16	1	18	1
	Essays—*Military Science and Tactics 4*				

* The student elects one or the two groups of studies marked *a* and *b*.

THE AGRICULTURAL COURSE.

The design of the course in agriculture is to give to young men such a knowledge of the sciences as will assist in making them successful farmers, or fit them to give intelligent direction to the thought and methods that underlie all agricultural advancement. The theoretical instruction in this course is given mainly by lectures, but this is associated with practical work and observations in the field, laboratories, dairy, and forcing houses. Practice is combined with theory whenever it is necessary for the demonstration of a principle or involves skilled labor, but the student's time is not consumed in merely manual operations.

Every effort is exerted to make the student conversant with the latest phases and discoveries of the rapidly broadening sciences, and with the best methods and processes in their application to the art of agriculture.

The distinctive studies of this course are on technical lines; but the branches pertaining to general culture, to social and civil relations, occupy an important place. It is generally recognized that this course is broadly educational, and furnishes the student an intellectual training and knowledge of facts such as are necessary in professional or business life.

The farm, comprising three hundred and seventy acres of tillage, pasture, wood, and timber land, is well equipped with modern farm buildings, tools and machinery; the stables are stocked with horses, sheep, swine, and cattle.

The field and other experiments of the Experiment Station are also of the greatest value as an aid in converting in the mind of the student the theories of the lecture room into the working principles of practical life.

Upon graduation the student receives the degree of Bachelor of Science; three years later, on proof of satisfactory advancement and on presentation of a thesis embodying original work or investigation, he receives the degree of Master of Science.

THE AGRICULTURAL COURSE.

For the Freshman Year see page 28.

Instructors.	Studies.	Fall Term. Weeks.	Fall Term. Hours.	Spring Term. Weeks.	Spring Term. Hours.
	SOPHOMORE YEAR.				
Prof. Estabrooke	French—*Rhetoric and Modern Languages 5*	16	2		
	French—*Rhetoric and Modern Languages 6*			20	2
	German—*Rhetoric and Modern Languages 7*	16	3		
	German—*Rhetoric and Modern Languages 8*			20	2
Prof. Aubert	General Chemistry - *Chemistry 1*	16	5		
Mr. Colby	Analytical Chemistry—*Chemistry 5*	16	4		
Prof. Aubert Mr. Colby	Qualitative Chemistry—*Chemistry 6*			20	16
Prof. Stevens	General Physics—*Physics 1*	16	5		
	Laboratory Physics—*Physics 2*	16	4		
	Heat, Optics, Magnetism and Electricity—*Physics 3*			20	5
	Laboratory Physics—*Physics 4*			20	4
Prof. Harvey	Cryptogramic Botany—*Natural History 3*	16	5		
	Laboratory Botany—*Natural History 4*	16	4		
Lieut. Hersey	Military Exercises—*Military Science and Tactics 1*	16	3	20	3
	JUNIOR YEAR.				
Prof. Hart	General Astronomy — *Mathematics and Astronomy 8*			10	5
Prof. Estabrooke	German—*Rhetoric and Modern Languages 9*	16	2		
	German—*Rhetoric and Modern Languages 10*			20	2
Prof. Rogers	Logic—*Logic and English Literature 1*			20	5
	English Literature—*Logic and English Literature 2*	16	5		
Prof. Aubert	Analytical Chemistry—*Chemistry 10*	16	6		
Mr. Colby	Analytical Chemistry—*Chemistry 13*			20	4
Prof. Harvey	Invertebrate Zoology—*Natural History 7*	16	5		
	Laboratory Zoology—*Natural History 8*			10	4
	Entomology—*Natural History 11*			10	5
Prof. Balentine	Agricultural Chemistry—*Agriculture 2*	16	5		
	Agricultural Physics—*Agriculture 4*			4	5
Prof. Balentine Prof. Gowell	Agricultural Engineering—*Agriculture 5*			6	5
Prof. Balentine	Agricultural Chemistry—*Agriculture 6*			10	5
Prof. Munson	Pomology—*Horticulture 1*	8	3		
	Olericulture—*Horticulture 2*	8	3		
	Plant Variation—*Horticulture 3*			10	3
	Landscape Gardening — *Horticulture 4*			10	3
	Laboratory Horticulture—*Horticulture 5*	16	4	20	2
Lieut. Hersey	Military Exercises—*Military Science and Tactics 1*	16	3	20	3
	Military Science—*Military Science and Tactics 2*	16	1	20	1

THE AGRICULTURAL COURSE—CONCLUDED.

Instructors.	Studies.	Fall Term.		Spring Term.	
		Weeks.	Hours.	Weeks.	Hours.
	SENIOR YEAR.				
Prof. Rogers	Pschology—*Logic and English Literature 3*	16	3	18	3
	Political Economy—*Civics 2*	16	5		
	Municipal Law—*Civics 4*	16	1	18	1
	Constitutional Law—*Civics 3*			14	5
	International Law—*Civics 5*			4	5
Mr. Colby	Mineralogy—*Chemistry 16*			6	5
Prof. Harvey	Comparative Vertebrate Zoology—*Natural History 9*	16	5		
	Laboratory Zoology—*Natural History 10*	16	4		
	Geology—*Natural History 13*			12	5
Prof. Balentine	Agricultural Chemistry—*Agriculture 3*	16	5		
Prof. Gowell	Stock Feeding—*Agriculture 7*	4	5		
	Dairying—*Agriculture 8*	6	5		
	Poultry Industry—*Agriculture 10*	6	5		
	Stock Breeding—*Agriculture 9*			8	5
Dr. Russell	Veterinary Science—*Agriculture 11*			10	5
Lieut. Hersey	Military Exercises—*Military Science and Tactics 1*	16	3	18	3
	Military Science—*Military Science and Tactics 3*	16	1	18	1
	Essays—*Military Science and Tactics 4*				

THE CHEMICAL COURSE.

The course in chemistry is designed for those who wish to become professional chemists and analysts, teachers of chemistry, or chemists and managers of industries in which an extensive knowledge of chemistry is important. Especial attention is given to the preparation of students for the work of the agricultural experiment stations. The course is so arranged that it furnishes an admirable preparation for the study of medicine. In addition to a thorough knowledge of chemistry, the student acquires, in his biological studies, knowledge of comparative anatomy, and of the lower forms of life, and in his work in the chemical laboratory, facility in the manipulation of chemical apparatus and the microscope. These are of the greatest importance to the physician, though the medical student as such can devote but comparatively little time to them.

The lectures and recitations are closely associated with practical work in the laboratories where the students, under the guidance of the instructors become acquainted with the methods and apparatus of qualitative analysis and of metallurgy. The student is drilled in the use of chemical apparatus, accurate observation and careful interpretation of directions.

In order to familiarize the student with chemical publications in other languages than English French text books are used for some of the more important studies in the course, and occasional translations and readings from the German periodicals are required.

Upon graduation the student receives the degree of Bachelor of Science; three years later, on proof of satisfactory advancement and on presentation of a thesis embodying original work or investigation, he receives the degree of Master of Science.

THE CHEMICAL COURSE.

For the Freshman Year see page 28.

Instructors.	Studies.	Fall Term.		Spring Term.	
		Weeks.	Hours.	Weeks.	Hours.
	SOPHOMORE YEAR.				
Prof. Estabrooke	French—*Rhetoric and Modern Languages 5*	16	2		
	French—*Rhetoric and Modern Languages 6*			20	2
	German—*Rhetoric and Modern Languages 7*	16	3		
	German—*Rhetoric and Modern Languages 8*			20	2
Prof. Aubert	General Chemistry—*Chemistry 1*	16	5		
Mr. Colby	Analytical Chemistry—*Chemistry 5.*	16	4		
Prof. Aubert Mr. Colby	Analytical Chemistry—*Chemistry 6.*			20	16
Prof. Stevens	General Physics—*Physics 1*	16	5		
	Laboratory Physics—*Physics 2*	16	4		
	Heat, Optics, Magnetism and Electricity—*Physics 3*			20	5
	Laboratory Physics—*Physics 4*			20	4
Prof. Harvey	Cryptogramic Botany—*Natural History 3*	16	5		
	Laboratory Botany—*Natural History 4*			16	4
Lieut. Hersey	Military Exercises—*Military Science and Tactics 1*	16	3	20	3
	JUNIOR YEAR.				
Prof. Hart	General Astronomy—*Mathematics and Astronomy 8*			10	5
Prof. Estabrooke	German—*Rhetoric and Modern Languages 9*	16	2		
	German—*Rhetoric and Modern Languages 10*			20	2
Prof. Rogers	Logic—*Logic and English Literature 1*			20	5
Mr. Colby	Chemical Theory and Advanced Inorganic Chemistry—*Chemistry 2*	16	3		
Prof. Aubert	Organic Chemistry—*Chemistry 3*			20	3
Prof. Aubert Mr. Colby	Analytical Chemistry—*Chemistry 8.* Agricultural Chemistry—*Chemistry 12*	16	10	8 12	6 6
Prof. Harvey	Invertebrate Zoology—*Natural History 7*	16	5		
	Laboratory Zoology—*Natural History 8*			10	4
	Entomology—*Natural History 11*			10	5
Lieut. Hersey	Military Exercises—*Military Science and Tactics 1*	16	3	20	3
	Military Science—*Military Science and Tactics 2*	16	1	20	1

THE CHEMICAL COURSE—CONCLUDED.

Instructors.	Studies.	Fall Term. Weeks.	Fall Term. Hours.	Spring Term. Weeks.	Spring Term. Hours.
	SENIOR YEAR.				
Prof. Rogers	Psychology—*Logic and English Literature 3*	16	3	20	3
	Political Economy—*Civics 2*	16	5		
	Constitutional Law and History—*Civics 3*			14	5
	International Law—*Civics 5*			4	5
Prof. Aubert	Organic Chemistry—*Chemistry 4*	16	3		
	Volumetric Analysis and Assaying—*Chemistry 11*	6	8		
Prof. Aubert, Mr. Colby	Preparation of Organic Chemicals *Chemistry 14*	10	6		
Mr. Colby	Photographic Chemistry—*Chemistry 15*	10	2		
	Mineralogy—*Chemistry 16*			6	5
Prof. Harvey	Comparative Vertebrate Zoology—*Natural History 9*	16	5		
	Laboratory Zoology—*Natural History 10*	16	4		
	Geology—*Natural History 13*			12	5
Lieut. Hersey	Military Exercises—*Military Science and Tactics 1*	16	3	18	3
	Military Science—*Military Science and Tactics 3*	16	1	18	1
	Essays—*Military Science and Tactics 4*				

THE CIVIL ENGINEERING COURSE.

The object of this course is to give the student a thorough knowledge of higher mathematics, mechanics and drawing, experience in the care and use of the ordinary engineering instruments, and a thorough drill in the application of mathematical principles and rules, with a view to fitting the student at graduation to apply himself at once to engineering work, and to qualify him, after experience in the field, to fill positions of importance and trust. The course is planned to furnish with technical instruction the basis of a liberal education. Especial attention is given to English, modern languages and economics.

The method of instruction includes recitations from text-books, lectures, original problems, work in the testing laboraties, field practice, and work in the designing room where original designs are figured and the necessary drawings prepared. In the last year of the course special effort is made to acquaint the student with the best engineering structures and the standard works in engineering literature.

The facilities for instruction are excellent. The engineering building which has been recently erected is heated and thoroughly ventilated by means of the Sturtevant blower system, and contains recitation rooms, designing rooms, testing laboratories, drawing rooms, and instrument rooms as good as any to be found in the country. These rooms are all thoroughly equipped. Beside the instruments ordinarily used by the professional engineer, the department has a fine plane table, a solar compass, a testing machine for iron, a testing machine for cement, and various pieces of apparatus for standard measurements.

Upon graduation the student receives the degree of Bachelor of Civil Engineering; three years later, on proof of satisfactory advancement and on presentation of a thesis embodying original work or investigation, he receives the degree of Civil Engineer.

THE CIVIL ENGINEERING COURSE.

For the Freshman Year see page 28.

Instructors.	Studies.	Fall Term.		Spring Term.	
		Weeks.	Hours.	Weeks.	Hours.
	SOPHOMORE YEAR.				
Prof. Hart	Analytical Geometry—*Mathematics and Astronomy 5*			20	5
Prof. Estabrooke	French—*Rhetoric and Modern Languages 5*	16	2		
	French—*Rhetoric and Modern Languages 6*			20	2
	German—*Rhetoric and Modern Languages 7*	16	3		
	German—*Rhetoric and Modern Languages 8*			20	2
Prof. Aubert	General Chemistry—*Chemistry 1*	16	5		
Prof. Aubert Mr. Colby	Analytical Chemistry—*Chemistry 7*			10	6
Prof. Stevens	General Physics—*Physics 1*	16	5		
	Laboratory Physics—*Physics 2*	16	4		
	Heat, Optics, Magnetism and Electricity—*Physics 3*			20	5
	Laboratory Physics—*Physics 4*			20	4
Mr. Grover	Mechanical Drawing—*Drawing 2*	16	6		
	Plane Surveying—*Civil Engineering 2*			10	5
	Field Work in Surveying—*Civil Engineering 3*			10	6
Mr. Webb	Descriptive Geometry—*Mechanical Engineering 2*	16	5	10	5
Lieut. Hersey	Military Exercises—*Military Science and Tactics 1*	16	3	20	3
	JUNIOR YEAR.				
Prof. Hart	Differential Calculus—*Mathematics and Astronomy 5*	16	6		
	Integral Calculus—*Mathematics and Astronomy 6*			10	5
	General Astronomy—*Mathematics and Astronomy 8*			10	5
Prof. Estabrooke	German—*Rhetoric and Modern Languages 9*	16	2		
	German—*Rhetoric and Modern Languages 10*			20	2
Prof. Rogers	Logic—*Logic and English Literature 1*			20	5
Prof. Stevens	(a) Advanced Physics—*Physics 5**	16	2	20	2
Mr. Grover	Railroad Engineering—*Civil Engineering 4*	12	3		
	(b) Field Work and Drawing—*Civil Engineering 5**	12	18		
	(a) Field Work and Drawing—*Civil Engineering 6**	12	16		
Prof. Hamlin Mr. Grover	Highway Engineering—*Civil Engineering 7*	4	5		
Mr. Grover	Mechanics—*Civil Engineering 8*			16	5
Prof. Hamlin	Graphic Statics—*Civil Engineering 9*			4	5
Mr. Grover	(b) General Drawing—*Civil Engineering 10**			20	10
	(a) General Drawing—*Civil Engineering 11**			20	8
Lieut. Hersey	Military Exercises—*Military Science and Tactics 1*	16	3	20	3
	Military Science—*Military Science and Tactics 2*	16	1	20	1

THE CIVIL ENGINEERING COURSE—CONCLUDED.

Instructors.	Studies.	Fall Term. Weeks.	Fall Term. Hours.	Spring Term. Weeks.	Spring Term. Hours.
	SENIOR YEAR.				
Prof. Hart	Practical Astronomy—*Mathematics and Astronomy 9*	16	5		
Prof. Rogers	Political Economy—*Civics 2*			14	5
	Constitutional Law—*Civics 3*	16	5		
	Municipal Law—*Civics 4*	16	1	18	1
	International Law—*Civics 5*			4	5
Mr. Colby	Mineralogy—*Chemistry 16*			6	5
Prof. Harvey	Geology—*Natural History 13*			12	5
Mr. Grover	Stereotomy—*Civil Engineering 12*	8	5		
Prof. Hamlin	Sanitary Engineering—*Civil Engineering 13*	6	5		
	Higher Surveying—*Civil Engineering 14*	16	10		
	Mechanics of Materials—*Civil Engineering 15*	9	5		
Mr. Grover	Foundations and Masonry Construction—*Civil Engineering 16*			8	5
Prof. Hamlin	Hydraulic Engineering—*Civil Engineering 17*	7	5		
	Bridge Designing—*Civil Engineering 18*			12	5
Lieut. Hersey	Military Exercises—*Military Science and Tactics 1*	16	3	18	3
	Military Science—*Military Science and Tactics 3*	16	1	18	1
	Essays—*Military Science and Tactics 4*				

* The student elects one of the two groups of studies marked *a* and *b*.

THE MECHANICAL ENGINEERING COURSE.

This course is designed to give such a training in mathematics, mechanics, the principles of mechanism, drawing and manual arts as shall make the student competent to deal successfully with the problems of mechanical engineering. To give breadth, the course includes instruction in the natural sciences, English, the modern languages, philosophy and history. The technical courses are planned to furnish a sound basis for a professional career. These include the geometry of machinery, gearing, with problems and practice, transmission of motion, bolts, cams, couplings and links, the study and designing of valve and link motions used in the steam engine, analytical mechanics, strength of materials, expansion of steam, construction of steam engines, the designing of steam boilers, and hydraulics. The methods of instruction include lectures, recitations, practice in the shops, filing and iron working rooms and forge, the solution of numerous problems, the tests of theoretical results by comparison with machinery, inspection of important plans, etc.

The department shares the engineering building with the department of civil engineering. Machinery h ll, containing the shops and forge, has been recently equipped at great expense, with a complete set of the most approved apparatus.

Upon graduation the student receives the degree of Bachelor of Mechanical Engineering; three years later, on proof of satisfactory advancement and on presentation of a thesis embodying original work or investigation, he receives the degree of Mechanical Engineer.

THE MECHANICAL ENGINEERING COURSE.

For the Freshman Year see page 28.

Instructors.	Studies.	Fall Term. Weeks.	Fall Term. Hours.	Spring Term. Weeks.	Spring Term. Hours.
	SOPHOMORE YEAR.				
Prof. Hart	Analytical Geometry—*Mathematics and Astronomy 5*			20	5
Prof. Estabrooke	French—*Rhetoric and Modern Languages 5*	16	2		
	French—*Rhetoric and Modern Languages 6*			20	2
	German—*Rhetoric and Modern Languages 7*	16	3		
	German—*Rhetoric and Modern Languages 8*			20	2
Prof. Aubert	General Chemistry—*Chemistry 1*	16	5		
Prof. Stevens	General Physics—*Physics 1*	16	5		
	Laboratory Physics—*Physics 2*	16	4		
	Heat, Optics, Magnetism and Electricity—*Physics 3*			20	5
	Laboratory Physics—*Physics 4*			20	4
Prof. Flint	Drawing—*Mechanical Engineering 1.*			10	5
Mr. Webb	Descriptive Geometry—*Mechanical Engineering 4*	16	5	10	5
	Carpentry—*Mechanical Engineering 5*	16	6		
	Forge Work—*Mechanical Engineering 6*			20	7½
Lieut. Hersey	Military Exercises—*Military Science and Tactics 1*	16	3	20	3
	JUNIOR YEAR.				
Prof. Hart	Differential Calculus—*Mathematics and Astronomy 5*	16	6		
	Integral Calculus—*Mathematics and Astronomy 6*			10	5
	General Astronomy—*Mathematics and Astronomy 8*			10	5
Prof. Estabrooke	German—*Rhetoric and Modern Languages 9*	16	2		
	German—*Rhetoric and Modern Languages 10*			20	2
Prof. Rogers	Logic—*Logic and English Literature 1*			20	5
Prof. Stevens	(a) Advanced Physics—*Physics 5**	16	4	20	2
Mr. Webb	Mechanical Drawing—*Mechanical Engineering 2*			10	3
Prof. Flint	Machine Design—*Mechanical Engineering 3*			10	3
Mr. Webb	Mechanics—*Mechanical Engineering 7*	16	5	10	5
Prof. Flint	Kinematics—*Mechanical Engineering 8*	16	5		
Mr. Webb	Link and Valve Motion—*Mechanical Engineering 9*	16	4		
	(b) Machine Work—*Mechanical Engineering 10**	16	12½	20	12½
	(a) Machine Work—*Mechanical Engineering 11**	16	7½	20	7½
Lieut. Hersey	Military Exercises—*Military Science and Tactics 1*	16	3	20	3
	Military Science—*Military Science and Tactics 2*	16	1	20	1

* The student elects one of the two groups of studies marked *a* and *b*.

THE MECHANICAL ENGINEERING COURSE—CONCLUDED.

Instructors.	Studies.	Fall Term.		Spring Term.	
		Weeks.	Hours.	Weeks.	Hours.
	SENIOR YEAR.				
Prof. Hart	Practical Astronomy—*Mathematics and Astronomy 9*	16	5		
Prof. Rogers	Political Economy—*Civics 2*			14	5
	Constitutional Law—*Civics 3*	16	5		
	Municipal Law—*Civics 4*	16	1	18	1
	International Law—*Civics 5*			4	5
Mr. Colby	Mineralogy—*Chemistry 16*			6	5
Prof. Harvey	Geology—*Natural History 13*			12	5
Prof. Flint	Steam Engine—*Mechanical Engineering 12*	16	5		
	Hydromechanics—*Mechanical Engineering 13*			6	5
	Steam Boilers—*Mechanical Engineering 14*			10	5
	Testing—*Mechanical Engineering 15*			2	5
	Steam Engine Designing—*Mechanical Engineering 16*	16	10		
	Boiler Designing and Thesis Work—*Mechanical Engineering 17*			18	10
Lieut. Hersey	Military Exercises—*Military Science and Tactics 1*	16	3	18	3
	Military Science—*Military Science and Tactics 3*	16	1	18	1
	Essays—*Military Science and Tactics 4*				

NEW COURSES.

In the near future three new courses will be added to the list published in this catalogue. These are the following:

THE ELECTRICAL ENGINEERING COURSE.—Electrical engineering is a department of mechanical engineering, and the first, second, and third years of the course will be nearly identical with the first, second, and third years of the present course in mechanical engineering. The college has recently obtained a twenty-five-lamp dynamo and other apparatus necessary for the work of the fourth year. The instruction will be in charge of a practical electrician, and it is the purpose of the college to make the instruction so thoroughly practical that graduates will be prepared to enter at once upon actual work in the construction and management of electric plants. The equipment, while sufficient, is not elaborate, but it is expected that the Legislature at its next session will make provision for its increase. This course will be organized in the fall term of 1894.

THE PREPARATORY MEDICAL COURSE.—The preparatory medical course will agree closely with the present chemistry course for the first and second years. In the later years it will include a larger amount of work in physiology, zoology, bacteriology, and botany. This course will be organized in the fall term of 1894.

THE PHARMACY COURSE.—Those who are candidates for a degree as Bachelor of Science in Pharmacy will be required to pursue a four years course, the first and second years being devoted to general training in science and letters, the third and fourth to advanced and special training in chemistry, botany, and technical subjects. A shorter course of two years will lead to a certificate. This course will be organized in the fall term of 1895.

DEPARTMENTS OF INSTRUCTION.

MATHEMATICS AND ASTRONOMY.

PROFESSOR HART.

1. SOLID GEOMETRY.—A course the equivalent of books 6, 7, 8, of Wentworth's Solid Geometry, except the theorems relating to symmetrical figures and regular polyhedrons, and including applications to the mensuration of solids and original demonstrations.

Five hours a week for ten weeks.

2. ALGEBRA.—Theory of quadratic equations; binomial theorem with fractional and negative exponents; variations; inequalities; logarithms, including the solution of arithmetical problems and application to problems in compound interest and insurance; exponential and logarithmic series and computation of logarithms; indeterminate coefficients; partial fractions.

Text-book is Wells' College Algebra. *Five hours a week for thirteen weeks.*

3. TRIGONOMETRY.—Plane trigonometry. Proof of formulas and solutions of right and oblique triangles both by numerical values of the functions and by logarithms. Spherical trigonometry. Proof of formulas, and logarithmic solution of right and oblique triangles.

The text-book is Wentworth's Trigonometry. *Five hours a week for thirteen weeks.*

4. ANALYTIC GEOMETRY.—Plane analytic geometry of the point, right line, circle, ellipse, parabola and hyperbola; higher plane curves; solid analytic geometry.

Text-book is Nichols' Analytic Geometry. *Five hours a week for twenty weeks.*

5. CALCULUS.—Differentiation of algebraic, trigonometric, anti-trigonometric, exponential, and logarithmic functions;

formulas derived by method of limits; successive differentiation; development of functions; indeterminate forms, $\frac{0}{0}$, etc.; application of differention to the study of plane curves; maxima and minima.

The text-book is Osborne's Integral and Differential Calculus. *Six hours a week for sixteen weeks.*

6. INTEGRAL CALCULUS.—Integration by fundamental formulæ; integration of rational fractions; integration by rationalization; integrati n regarded as a summation; integration by parts; reduction formulæ; applications to finding the length of curves, areas of plane surfaces and surfaces of revolution, volumes of solids, center of gravity, moment of inertia and to problems in mechanics.

The text-book is Osborne's Differential and Integral Calculus. *Five hours a week for ten weeks.*

7. STUDENTS INTENDING TO CONTINUE the study of mathematics farther, or to fit themselves for teaching, will be assisted in additional work in any of the above studies.

8. GENERAL ASTRONOMY.—The text-book is supplemented by informal lectures, an elaborate set of drawings of celestial objects, lantern slides, and telescopic work, for which a 4-inch Clark equatorial telescope is available.

The text-book is Young's Elements of Astronomy. *Five hours a week for ten weeks.*

9. PRACTICAL ASTRONOMY.—A course embracing the theory and use of the sextant and artificial horizon, the theodolite, chronometer, and the altitude and azimuth instrument; solution of various problems relating to the astronomical triangle; conversion of time; latitude by a meridian altitude, by an altitude at any time, by circum-meridian altitudes; time by star transits, and by equal altitudes of a star or the sun; longitude by a single altitude, by moon culminations, by telegraph; azimuth by a circumpolar star at elongation, by an altitude of a star or the sun. Other topics treated vary from year to year. The present instrumental equipment consists of two sextants and artificial horizons, a theodolite by Buff & Berger, made with reference to astronomical work, a sidereal and a mean time chronometer, and a vertical circle with 1.8 in. objective, made by A. Repsold & Son.

Instruction is by lectures. *Five hours a week for sixteen weeks.*

Courses 1, 2, 3, 9 are required for all students, 4, 5, 6, 7, 10 for engineering students only.

RHETORIC AND MODERN LANGUAGES.

PROFESSOR ESTABROOKE.

1. RHETORIC.—The subjects taught are: The classification of sentences—rhetorical, grammatical; analysis of the sentence with reference to punctuation; exercises in punctuation; diction, with special reference to purity, propriety, and precision of language; clearness, strength, and unity of sentences; extended study of the paragraph; themes—including the narrowing of the subject from general to particulars, construction of outline, etc.

The text-book is Williams's Rhetoric. *Five hours a week for sixteen weeks.*

2. ANGLO-SAXON.—Elements of Anglo-Saxon grammar; reading of easy prose, such as the Gospel of St. John, selections from Aelfric's Homilies, the Voyage of Wulfstan and Othere, selections from the Anglo-Saxon Chronicle. Constant reference is made to the relation of Anglo-Saxon to modern English.

The text-books are Carpenter's Grammar and Corson's Handbook of Anglo-Saxon and Early English. *Three hours a week for sixteen weeks.*

3. ENGLISH PHILOLOGY.—The term English Philology is rather narrowly interpreted to mean the study of the Greek element of English, because the Greek enters so largely into our scientific terms. In pursuing this study so much of the Greek grammar is taught as is needed to render clear the derivation of the words and some of the changes which they have undergone.

The text-books are Goodell's Greek in English and Goodwin's Greek Grammar. *Three hours a week for twenty weeks.*

4. FRENCH.—Elements of French grammar and reading of selections from easy prose.

The text-books are Edgren's French Grammar and Super's Reader. *Five hours a week for twenty weeks.*

5. FRENCH.—Reading of easy prose and verse, with constant reference to grammatical construction.

The text-books are Super's Reader and Histoire de la Mère Michel et de Son Chat. *Two hours a week for sixteen weeks.*

6. FRENCH.—Reading of more difficult prose such as is found in the popular novels and plays; reading of French history.

The text-books are Histoire de la Mère Michel et de Son Chat, Mademoiselle de la Seiglière, Vie de Napoléon, Tableaux de la Revolution Française, or Super's Readings from French History. *Two hours a week for twenty weeks.*

7. GERMAN.—Elements of German grammar and reading of selections of easy prose and verse.

The text-books are Harris's German Lessons and Joyne's Reader. *Three hours a week for sixteen weeks.*

8. GERMAN.—This course is a continuation of course 7.

The text-books are Joyne's Reader, Meissner's German Grammar, and Storm's Immensee. *Two hours a week for twenty weeks.*

9. ADVANCED GERMAN.—Reading of more difficult prose.

The text-book is Hauff's Das Kalte Hertz. *Two hours a week for sixteen weeks.*

10. SCIENTIFIC GERMAN.—Reading of scientific German.

The text-book is Gore's Science Reader or Hodge's Science Reader. *Two hours a week for twenty weeks.*

11. THEMES AND DECLAMATIONS.—Declamations, theme writing, and written translations extend throughout the entire course. During the Sophomore and Junior years declamations are selected; in the Senior year they are original.

LOGIC AND ENGLISH LITERATURE.

PROFESSOR ROGERS.

1. LOGIC.—It is the object of this course to give the student a just appreciation of the functions of language as a means of expressing thought, and familiarity with the principles of deductive and inductive reasoning. The student is given frequent drill in the application of logical principles with the idea that not only should these principles be comprehended but that they should be so digested and assimilated as to make them a part of the intellectual fibre.

The instruction is given mainly by lectures. *Five hours a week for sixteen weeks.*

2. ENGLISH LITERATURE.—Arnold's Manual of English Literature serves as a guide for the work done, which consists of a careful study of some of the master-pieces of our language and of the historical and other conditions under which they were produced. The library is used in connection with these lectures and recitations as the laboratory is used in the study of the experimental sciences.

Five hours a week for twenty weeks.

3. PSYCHOLOGY.—Porter's Psychology is used as a text-book. *Three hours a weeks for thirty-six weeks.*

CIVICS.

PROFESSOR ROGERS.

1. GENERAL HISTORY.—A short elementary course for the Freshman Class is based on recitation in Myer's General History.

One hour a week for thirty-six weeks.

2. POLITICAL ECONOMY.—Instruction is given by lectures. Topical readings and investigation are required. Recognizing that the basis of Economics is in the advancing civilization and changing conditions of the people, that its objective point is not ultimate principles, but the most advantageous adaptation of present means to these conditions, the aim of the instruction given is not to supply the student with inferences ready made, but to teach him to think for himself. With the habit of logical and systematic thought upon these subjects once acquired, the best sources for information upon economic matters are not in the text-books of ten, fifteen, or fifty years ago, but in the daily newspaper; for it is in comprehending the questions of public policy of the present day that the study of Political Economy does its work in making men better fitted for the responsible duties of citizenship.

Five hours a week for sixteen weeks.

3. MUNICIPAL LAW.—Instruction is given by lectures, which are intended to set forth the general principles of law. Among the topics discussed are the general principles of contracts, sales, notes and bills, conveyancing, agency, bailments, and insurance. These subjects are considered very briefly and generally; but it is believed that the instruction given, in addition to its educational value, will be useful in preventing vexatious and expensive litigation.

One hour a week for thirty-four weeks.

4. CONSTITUTIONAL LAW AND HISTORY.—Instruction is given mainly by lectures on which the student is required to make copious notes and to take weekly examinations. The course includes an outline of Anglo-Saxon institutions, the development of the English Constitution until modern times, the growth and political conditions of the American colonies prior to their independence, the Articles of Confederation, the causes leading to the adoption of the Constitution; the comparative study of the Federal and the State Constitutions, clause by clause, from historical and legal standpoints. The political history of the United States is discussed as fully as time permits.

Five hours a week for fourteen weeks.

5. INTERNATIONAL LAW.—Many of the principles of International Law are discussed in connection with the subject of Constitutional Law and History. Such matters of importance as are not already so taken up are discussed by lectures during the closing weeks of the senior year.

Five hours a week for four weeks.

6. THE PHILOSOPHY OF HISTORY.—The literature, learning, political and economic conditions of the great historic nations are discussed, and the growth of institutions carefully considered. Fisher's Outlines of General History serves as a basis for the work done, and is supplemented by lectures and topical studies.

Five hours a week for sixteen weeks.

CHEMISTRY.

PROF. AUBERT; MR. COLBY.

1. GENERAL CHEMISTRY.—Recitations and lectures on the general principles of chemistry, illustrated by charts, experiments, etc. This course is designed to give the student a general survey of the theories of chemistry, the preparation and properties of the most important elements and their compounds, and of some of the important chemical industries. It serves as a basis for the other courses.

The text-book is Fischer's Lessons in Elementary Chemistry. *Five hours a week for sixteen weeks.* PROF. AUBERT.

2. CHEMICAL THEORY AND ADVANCED INORGANIC CHEMISTRY.—This course will be required of all students in chemistry. It is illustrated by problems and by the examination of museum specimens.

The text-books are Walker and Dobson's Chemical Theory, and Naquet's Principes de Chimie, Vol. I. *Three hours a week for sixteen weeks.* MR. COLBY.

3. ORGANIC CHEMISTRY.—This course consists of lectures and recitations. It is illustrated by specimens from the collection of organic chemicals.

The text-book is Naquet's Principes de Chimie, Vol. II. *Three hours a week for twenty weeks.* PROF. AUBERT.

4. ORGANIC CHEMISTRY.—This course is a continuation of Course 3

Three hours a week for sixteen weeks. PROF. AUBERT.

5. ANALYTICAL CHEMISTRY.—This is a preliminary course. It consists of laboratory experiments illustrative of the chemical properties of the elements and their compounds. The student follows the lectures and experiments of Course 1, performing the experiments and working out the reactions involved.

The text-book is Hart's Laboratory Exercises for Beginners. *Four hours a week for sixteen weeks.* MR. COLBY.

6. ANALYTICAL CHEMISTRY.—This is a course in qualitative analysis, consisting of laboratory practice in the determination and separation of the common acids and bases, with occasional recitations, lectures and exercises in the solution of problems, and in the writing of the reactions involved.

The text-book is Craft's Qualitative Analysis. *Sixteen hours a week for twenty weeks.* PROF. AUBERT AND MR. COLBY.

7. ANALYTICAL CHEMISTRY.—This is a course in qualitative analysis, shorter than Course 5, arranged for students who do not wish the extended course required of those taking the Courses in Chemistry.

The text-book is Craft's Qualitative Analysis. *Six hours a week for ten weeks.* PROF. AUBERT AND MR. COLBY.

8. ANALYTICAL CHEMISTRY.—This is a course in qualitative analysis, intended to make the student familiar with the most approved and rapid methods. It includes the determination of Fe from iron wire, Mg from magnesium wire, Al_2O_3 and SO_3 from alum, CaO from calcic carbonate, Cl from salt, Cu from copper sulfate, As from arsenous oxid, Hg from mercuric chlorid, Pb and Sn from solder, Pb, Cu and Zn from brass, SiO_2, $Al_2O_3Fe_2O_3$, Ca O, MgO, and CO_2 from dolomite and the complete analysis of feldspar.

The text-books are Appleton's Quantitative Analysis and Einleitung in die Chemische Analyse, by L. Medicus. *Ten hours a week for sixteen weeks, and six hours a week for eight weeks.* PROF. AUBERT AND MR. COLBY.

9. ANALYTICAL CHEMISTRY.—This course is similar in the main, to Course 8, but is abridged in some of its details to accommodate students wishing some practice in quantitative analysis, but who do not wish the more extended courses.

Four hours a week for thirty-six weeks. PROF. AUBERT AND MR. COLBY.

10. ANALYTICAL CHEMISTRY.—This course is like course 9, but shorter.

Six hours a week for sixteen weeks. PROF. AUBERT AND MR. COLBY.

11. VOLUMETRIC ANALYSIS AND ASSAYING.—This course consists of a series of determinations in acidimetry and alkalimetry, and in other volumetric methods used in commercial work. A short course is given in the assay of ores for gold and silver.

The text-books are Fleischer's Volumetric Analysis and Clark's Assay Notes. *Eight hours a week for six weeks.* PROF. AUBERT AND MR. COLBY.

12. AGRICULTURAL CHEMISTRY.—This course includes the analysis of fertilizers, milk, butter, fodders, etc.

The text-book is the Methods of the Association of Official Agricultural Chemists. *Six hours a week for twelve weeks.* PROF. AUBERT AND MR. COLBY.

13. AGRICULTURAL CHEMISTRY.—Similar in its general outlines to course 12, but less extended.

Four hours a week for twenty weeks. PROF. AUBERT AND MR. COLBY.

14. THE PREPARATION OF ORGANIC CHEMICALS.—This course is designed to make the student familiar with the more common forms of apparatus and processes used in the preparation and synthesis of organic substances.

Cohen's Practical Organic Chemistry is used for reference. *Six hours a week for ten weeks.* PROF. AUBERT.

15. PHOTOGRAPHY AND PHOTOGRAPHIC CHEMISTRY.—The course consists of lectures and practical work in the field and photographic laboratory.

Two hours a week for ten weeks. MR. COLBY.

16. MINERALOGY.—This is a course in determinative mineralogy and blowpipe analysis, designed to enable the student to determine the nature of unknown minerals by the blowpipe, and to become familiar with the more common minerals by the use of the working collection.

The text-books are Dana's Manual of Mineralogy and Petrography, and Crosby's Tables for the Determination of Minerals. *Five hours a week for six weeks.* MR. COLBY.

PHYSICS.

PROFESSOR STEVENS.

1. GENERAL PHYSICS.—Lectures on properties of matter and general laws of physics, mechanics, gases, liquids, and sound. The student is required to solve numerous problems illustrating these topics.

Five hours a week for sixteen weeks.

2. LABORATORY WORK.—Laboratory work consists in introductory measurements, including the theory and use of such instruments as the vernier, spherometer, kathetometer, and the hook-gauge; the determination of the coefficient of friction, the breaking strength of wires, the deflection of beams, the laws of the common and the torsion pendulum, and the specific gravity of solids and liquids.

Four hours a week for sixteen weeks.

3. HEAT, OPTICS, MAGNETISM AND ELECTRICITY.—Lectures are given on heat, optics, magnetism and electricity. The principal subjects discussed in the lectures are illustrated by experiments before the class.

Five hours a week for twenty weeks.

4. LABORATORY WORK.—Such problems as the determination of the pitch of a tuning-fork, of specific heat, the use of meteorological instruments, photometry, spectroscopy, measurements of the angle of a prism by Babinet's and Wollaston's goniometers, determination of index of refraction, microscopic measurements and drawings with the camera lucida, various elementary electrical measurements.

Four hours a week for twenty weeks.

5. ADVANCED PHYSICS —The work of this course varies from year to year. This year a course in geometrical optics is given during the fall term, supplemented by the measurement of a wave length of light by use of the transmission and reflection gratings and some work in simple harmonic motion. A course in sound is given during the spring term.

Two hours a week for the year.

6. ADVANCED LABORATORY WORK IN ELECTRICITY.—The work of this course is about that of the third year of a course in electrical engineering. Various methods of determining resistance, electromotive force and current strength, are worked out. H is determined by a magnetometor. A twenty-five lamp dynamo is operated and tested by students. One lecture a week is given to students on the mathematical theory of the various instruments used in the laboratory.

The text-book is Kempe's Hand-book of Electrical Testing. *Two or four hours a week for the year*

7. ADVANCED LABORATORY WORK IN OPTICS AND MECHANICS.—The student investigates both theoretically and experimentally the laws governing these branches. In this course, and especially in mechanics, engineering students find an opportunity of verifying many of the laws and principles laid down in their text-books.

Two or four hours a week for the year.

Courses 1, 2, 3, 4, are required for all students; course 5 is required for students in the scientific course and elective for other students; Courses 6 and 7 are elective.

NATURAL HISTORY.

PROFESSOR HARVEY; MR. BRIGGS.

1. GENERAL BOTANY.—This course treats of the structure and uses of the organs of plants; the relation of the plant to the soil and atmosphere; the description, classification and naming of plants; the preparation of plants for the herbarium; the relationship of the more important agricultural plants; and a special study of forage plants.

Text-book, Gray's Manual and lessons, supplemented by lectures, study of charts and Brendel plant models, special collections of weeds and forage plants, and a general herbarium of five thousand species. *Five hours a week for twenty weeks.* MR. BRIGGS.

2. LABORATORY BOTANY.—These exercises comprise the analysis, description, drawing and classification of plants, field work, and the preparation of fifty herbarium specimens. Instruction is given on the preparation, arrangement and care of large herbaria, and illustrated by a study of the college herbarium.

Ten hours a week for eight weeks. MR. BRIGGS.

3. CRYPTOGAMIC BOTANY.—This course embraces a detailed study of about thirty type forms of the prominent groups of non-flowering plants. Their life histories are traced in detail by the aid of compound microscopes, and accurate drawings are made. Special attention is given to useful and injurious forms. Such injurious species as blue mold, black molds, fish molds, mildews, wheat smut, corn smut, ergot, potato rot, black knot, bacteria, etc., are especially studied, and known remedies considered. Fungicides and spraying apparatus receive attention. Students are required to collect specimens and prepare them for the herbarium.

Text-books, Bessey's Botany, Martin and Huxley's Biology, Arthur, Barnes and Coulter's Plant Dissection, Campbell's Structural and Systematic Botany, Bentley's Botany, Spaulding's Introduction to Botany, Dodge's Practical Biology, Bennet and Murray's Cryptogamic Botany. In addition to these, books of reference are in constant use and special articles and monographs carefully studied. The facilities for giving instruction are a convenient laboratory, a herbarium of fully five thousand species, a set of Brendel models, charts, and a rich local cryptogamic flora. *Five hours a week for sixteen weeks.* PROF. HARVEY.

4. LABORATORY BOTANY.—This course embraces instruction in the use of the microscope, micrometers, camera lucida, microtome; the preparation of slides; the study of the life history, analysis, description, classification, illustration of cryptogams, and their preparation for the herbarium.

Four hours a week for sixteen weeks. PROF. HARVEY.

5. HUMAN PHYSIOLOGY.—A study of the anatomy, physiology, hygiene and pathology of the human body. The text-book is supplemented by lectures and illustrated by the use of a skeleton, manikin, models of the human larynx, ear, eye and brain, charts, microscopic slides, fresh, dried and alcoholic material.

The text-book is Martin's Human Body. *Five hours a week for sixteen weeks* MR. BRIGGS.

6. LABORATORY PHYSIOLOGY.—Examination of skeleton, manikin, charts, models, microscopic slides and the dissection of lower animals.

Two hours a week for sixteeen weeks. MR. BRIGGS.

7. GENERAL INVERTEBRATE ZOOLOGY.—A detailed study of type forms of all the branches of invertebrates.

Packard's Zoology is used as a guide. Martin and Huxley's, Brooks', Colton's, and Osborne's laboratory manuals when applicable are followed in laboratory practice. The student makes daily use of the compound microscope in examining minute forms and tissues, makes dissections and careful drawings, and classifies the forms studied. Fresh, dried and alcoholic materials, charts, models, and the working library of reference books are in constant use. The recitations are usually conducted in the laboratory and pertain to the type forms under consideration. *Five hours a week for sixteen weeks.* PROF. HARVEY.

8. LABORATORY ZOOLOGY.—This course is a continuation of course 7.

Four hours a week for ten weeks. PROF. HARVEY.

9. COMPARATIVE VERTEBRATE ZOOLOGY.—A comparative study of type forms of vertebrate animals. The methods and facilities for work are the same as in course 7. The department is provided with a set of Auzoux's Models and a good working collection of type forms. Special attention is given to the zoology of the domestic animals.

Packard's Zoology is used as a guide, but laboratory manuals and many monographs are used in addition. *Five hours a week for sixteen weeks.* PROF. HARVEY

10. LABORATORY ZOOLOGY.—Museum work; study of charts, and models, and of the life history of special forms; dissections of a fish, frog, turtle, bird and rat or rabbit; methods of preparing specimens for collections.

Four hours a week for sixteen weeks. PROF. HARVEY.

11. ENTOMOLOGY.—The study of the anatomy, physiology, classification, and economic importance of insects. Especial attention is given to injurious and beneficial insects. Insecticides and approved methods of destroying insects are considered. The department has for illustration a collection of insects, charts, models, and an abundant insect fauna.

The text-books are Packard's Entomology for Beginners, and Comstock's Entomology. A full set of Riley's, Fitch's, and Lintner's Reports, the entomological publications of the U. S. Department of Agriculture, the Illinois Reports, various other State and experiment station reports and current literature are used for reference. *Five hours a week for ten weeks.* PROF. HARVEY.

12. LABORATORY WORK.—The life history, anatomy and classification of type forms; insecticides, spraying and insecticide apparatus.

Four hours a week for twelve weeks. PROF. HARVEY.

13. GEOLOGY.—The course is illustrated by mineral, rock, and fossil specimens, and by charts, maps, and diagrams. Especial attention is given to the origin and formation of soils, to the method of conducting a geological survey and to the geology of Maine. Excursions are made to points of interest.

The text-book is Le Conte's Elements of Geology. *Five hours a week for twelve weeks.* PROF. HARVEY.

AGRICULTURE.

PROF. BALENTINE; PROF. GOWELL; DR. RUSSELL.

1. AGRICULTURE.—This course consists of lectures on the relations of the natural and physical sciences to agriculture.

Five hours a week for six weeks. PROF. BALENTINE, PROF. GOWELL.

2. AGRICULTURAL CHEMISTRY.—This course consists of lectures and recitations on the composition of plants, the sources of their food and the processes by which it is assimilated.

The text-books are Johnson's How Crops Grow, and Storer's Agriculture. *Five hours a week for sixteen weeks.* PROF. BALENTINE.

3. AGRICULTURAL CHEMISTRY.—This course consists of lectures on the origin, formation and composition of soils, and their physical characteristics; farm manures and commercial fertilizers.

The text-books are Johnson's How Crops Feed and Storer's Agriculture. *Five hours a week for sixteen weeks.* PROF. BALENTINE.

4. AGRICULTURAL PHYSICS.—This course consists of lectures on the relation of soils to heat and moisture, the mechanical condition of soils best suited to plant growth and the objects to be gained by cultivation.

Five hours a week for four weeks. PROF. BALENTINE.

5. AGRICULTURAL ENGINEERING.—This course consists of lectures on farm drainage, irrigation; water supply for stock and household, farm implements and machinery, handling crops and construction of farm buildings, sites, etc.

Five hours a week for six weeks. PROF. BALENTINE; PROF. GOWELL.

6. AGRICULTURAL CHEMISTRY.—This course consists of lectures and recitations on animal nutrition, chemistry of milk and milk analysis.

The text-books are Armsby's Cattle Feeding and Station Reports. *Five hours a week for ten weeks.* PROF. BALENTINE.

7. PRACTICAL STOCK FEEDING.—This course consists of lectures on the production of cattle foods and their composition, and on formulating rations for milk and meat production; and practical application of the lectures to the animals in the herd.

The text-books are Armsby's Cattle Feeding, Stewart's Feeding of Cattle, and station reports. *Five hours a week for four weeks.* PROF. GOWELL.

8. DAIRYING.—Instruction consists of lectures upon the formation and composition of milk; ferments, and the practical handling of milk; testing for purity and value; the manufacture of butter and cheese by use of gravity and centrifugal devices and other appliances.

The text-books are Flint's Milch Cows, Arnold's Dairying, Stewart's Dairying, and station reports. *Five hours a week for six weeks.* PROF. GOWELL.

9. STOCK BREEDING.—Instruction consists of lectures upon animal reproduction, the principles of breeding, and the means of improvement and development. Practice is given in judging animals by a scale of points.

The text-books are Miles's Cattle Breeding, Saunders's Horse Breeding, and Curtis's Breeds. *Five hours a week for eight weeks.* PROF. GOWELL.

10. POULTRY INDUSTRY.—Instruction consists of lectures with practice in handling all classes of poultry, and judging by a scale of points; in breeding by natural and artificial processes; and in the use of machinery. Caponizing, and the construction and arrangement of buildings receive careful attention

Five hours a week for six weeks. PROF. GOWELL.

11. VETERINARY SCIENCE.—This course consists of lectures, demonstrations and clinics illustrated by models, natural preparations and living animals. Particular attention is given to means of preserving health, the nursing of sick animals, the prevention of contagious diseases and the treatment of the most common and simple diseases of cattle and horses.

Five hours a week for ten weeks. DR. RUSSELL.

HORTICULTURE.

PROFESSOR MUNSON.

1. POMOLOGY.—A discussion of the most approved methods of fruit culture; the most important enemies and diseases of fruits, with remedies and preventives.

Three hours a week for eight weeks.

2. OLERICULTURE, OR VEGETABLE GARDENING.—Lectures and practical work.

Three hours a week for eight weeks.

3. PLANT VARIATION.—A discussion of the underlying principles of horticulture. The course includes a consideration of the origin and distribution of cultivated plants; their variation as affected by soil, climate and cultivation; also a systematic study of plant-breeding, including the methods and effects of crossing, the principles of selection and the influence of heredity. Students in this course must have taken Botany course 1.

Three hours a week for ten weeks.

4. LANDSCAPE GARDENING.—Lectures and other class work. *Three hours a week for ten weeks.*

5. LABORATORY HORTICULTURE.—Practical work in the propagation and culture of plants, the construction and management of forcing structures, and the making of plans for rural improvements.

Four hours a week for sixteen weeks, and two hours a week for twenty weeks.

6. ELEMENTARY HORTICULTURE.—This course is arranged for the student of the training school in agriculture. Lectures and practical work by appointment.

DRAWING.

MR. BRIGGS; MR. GROVER.

1. FREE-HAND DRAWING.—This course consists of the exercises in parts five, seven and nine of Bartholomew's Industrial Drawing, drawing geometrical solids such as the cube, cylinder and prism, common objects such as chairs and tables, and practice in free-hand lettering.

Four hours a week for sixteen weeks. MR. BRIGGS.

2. MECHANICAL DRAWING.—This course consists of instruction and practice in the care and use of drawing instruments, in the drawing of geometrical problems and in water colors. Especial attention is given to accuracy and neatness.

Ten hours a week for twelve weeks. MR. GROVER.

CIVIL ENGINEERING.

PROF. HAMLIN; MR. GROVER.

1. MECHANICAL DRAWING.—Problems in shade and shadows, and dimension drawing.

The text-book is Faunce's Mechanical Drawing. *Six hours a week for sixteen weeks.* MR. GROVER.

2. PLANE SURVEYING.—This course includes recitations on the general principles of land surveying, the laying out of land, the dividing of land, surveying of public lands, direct leveling, and the variation of the magnetic needle.

The text-book is Staley's Gillespie's Surveying. *Five hours a week for ten weeks.* MR. GROVER.

3. FIELD WORK IN SURVEYING.—The student is made familiar with the uses of the chain, compass, transit, and level, working with each in the field. Instruments are adjusted, original surveys made, and old lines retraced. Deeds are examined, and descriptions of property traced back in the Penobscot County Registry of Deeds. In the drawing room plats are prepared of the surveys made in the field.

Six hours a week for ten weeks. MR. GROVER.

4. RAILROAD ENGINEERING.—The theory of railroad curves, switches, turnouts, and slope stakes, the calculation of earth works, and the resistance to trains offered by grades and curves, are the subjects specially considered. Lectures and recitations.

The text-book is Searles's Field Engineering. *Three hours a week for twelve weeks.* MR. GROVER.

5. FIELD WORK AND DRAWING.—The basis of this course is the location and detailed survey of a railroad several miles long. The methods of the best engineers are followed. The curves are laid out, levels taken, and all the necessary measurements made to enable the student to compute the excavations and embankments and estimate the cost of construction.

Eighteen hours a week for twelve weeks. MR. GROVER.

6. HIGHWAY ENGINEERING. — Attention is given chiefly to country highways and relates to the location, construction, and improvement of roads under different conditions of soil, climate, and traffic. The text-book is supplemented by lectures.

The text-book is Gillespie's Roads and Railroads. *Five hours a week for four weeks.* PROF. HAMLIN; MR. GROVER.

7. MECHANICS.—This course consists of problems in the composition and resolution of forces, followed by exercises in finding the moment of inertia, the center of gravity, the shearing force and bending moment.

The text-book is Lanza's Applied Mechanics. *Five hours a week for sixteen weeks.* MR. GROVER.

8. GRAPHIC STATICS.—The principles involved in the graphical resolution of forces are given by lectures. The stresses in the different parts of various trusses, under uniform or concentrated loads, are determined graphically in the drawing room. Lectures and exercises in the drawing room.

Five hours a week for four weeks. MR. GROVER.

9. GENERAL DRAWING.—Isometric and cabinet projections, and perspective, and the preparation of working drawings. Lectures and exercises in the drawing room.

Ten hours a week for twenty weeks. MR. GROVER.

10. GENERAL DRAWING.—This course is the same as Course 9 in its general features but occupies less time.

Eight hours a week for twenty weeks. MR. GROVER.

11. STEREOTOMY.—This course is a practical application of the methods of Descriptive Geometry, and for its successful completion a thorough knowledge of that subject is necessary. The student prepares the drawings required by the stone cutter and mason in building different kinds of masonry structures, such as retaining walls, bridge abutments, piers, and arches. Lectures and exercises in the drawing room.

Five hours a week for eight weeks. MR. GROVER.

12. SANITARY ENGINEERING.—Land drainage, drainage of houses and towns, plumbing of houses, sewerage of towns and cities, and the ventilation of houses are considered. Lectures.

Five hours a week for six weeks. PROF. HAMLIN.

13. HIGHER SURVEYING.—The student is taught the use of the plane table, solar compass,—as applied to the survey of public lands—stadia measurements, topographical surveying, and the elements of geodesy, such as the correct measurement of base lines, calculation of triangulation. The library is well supplied with books of reference. No text-book is used.

Ten hours a week for sixteen weeks. PROF. HAMLIN.

14. MECHANICS OF MATERIALS.—A detailed study of the properties of materials used in engineering structures, such as iron, steel, wood, and their resistance to bending, breaking, extension, and compression under the various conditions of practice. The testing laboratory is well equipped.

The text-books are Lanza's Mechanics, Merriman's Mechanics of Material, and lectures. *Five hours a week for nine weeks.* PROF. HAMLIN.

15. FOUNDATIONS AND MASONRY CONSTRUCTION.—Attention is given to the testing and use of the materials of masonry construction, building stone, brick, cement and lime. Among the subjects considered are different classes of foundations, natural and artificial; the stability of dams and retaining walls; the designing of bridge piers and abutments. The class room work is supplemented by exercises in the laboratory.

The text-book is Baker's Masonry Construction. *Five hours a week for eight weeks.* MR. GROVER.

16. HYDRAULIC ENGINEERING.—The weight, pressure and motion of water; the flow of water through orifices, and through pipes under pressure; the measuring of weirs and weir gauging; the flow of water in open channels, mains and distribution pipes; distribution systems; the construction of water works for towns and cities. The measurement of the flow of rivers is illustrated by the application of the current meter and the various forms of floats to the Penobscot river or some of its large branches. The department is well supplied with apparatus. The course includes frequent lectures and the solution of numerous problems.

The text-books are Fanning's Hydraulics and Church's Mechanics of Engineering Fluids. *Five hours a week for seven weeks.* PROF. HAMLIN.

18. BRIDGE DESIGNING.—The student is taught the method of calculating the stresses in the various forms of roof and bridge trusses, the methods of loading, and makes complete designs for bridges in wood and in iron, working out the dimensions of the parts, and preparing the drawings for the shop. Lectures.

The text-book is Johnson's Modern Framed Structures. *Fifteen hours a week for twelve weeks.* PROF. HAMLIN.

MECHANICAL ENGINEERING.

PROF. FLINT; MR. WEBB.

1. DRAWING.—The instruction in drawing given by this department begins with detail drawings of a machine. The student is required to take dimensions of a machine and make drawings in lead on cheap paper. These are then traced on cloth, and blue prints taken. Careful attention is given to blue printing; the student in many cases makes his sensitive paper.

Five hours a week for ten weeks. PROF. FLINT.

2. MECHANICAL DRAWING.—Drill is given in isometric and cabinet projection, tinting and line shading. Attention is given to the drawing of cams, lobed wheels, the different forms of gear teeth, link motions, and plain slide valves. All recitation work is illustrated, as far as possible, by exercises in the drawing room.

Three hours a week for ten weeks. MR. WEBB.

3. MACHINE DESIGN.—This subject is studied in the most practical way. The theoretical rules and formulas are applied to existing machines of standard manufacture for the comparison of the actual and theoretical dimensions. The rules for the dimensions of brackets, beams, posts, etc., are investigated and compared with results obtained by experiment. The subject of

riveted joints is fully considered, the student being required to solve numerous problems on the efficiency of the various kinds. Attention is given to the designing of bolts, keys, etc. Lubricants are studied and their adaptability to different kinds of machinery discussed. The subject of work in its various forms is investigated. The work done in the cylinder of an engine is determined by means of the indicator and compared with that done on the crank-pin at the same time. The diameter of line shafting, size of pulleys and crank shafts, weight of fly wheels, size of connecting rods, etc., are calculated in accordance with the best modern practice. In connection with this work the student is required to design a complete speed lathe and to make working drawings for its construction. The course includes numerous other exercises of a similar character.

Three hours a week for ten weeks. PROF. FLINT.

4. DESCRIPTIVE GEOMETRY.—The time of this course is divided equally between the recitation room and the drawing-room. The work in the drawing-room consists of thirty-six independent problems, of which sixteen are elementary, twelve are tangent problems, and eight are problems in working out the curves of intersection of planes, cylinders, cones, spheres, etc.

The text-book is Church's Descriptive Geometry. *Five Hours a week for twenty-six weeks.* MR. WEBB.

5. CARPENTRY.—This course commences with instruction and practice in the care and sharpening of tools, the squaring of stock, and taking work out of wind. This is followed by practice in making the different joints in soft and hard wood. Particular attention is paid to accuracy of workmanship. As a part of this course, instruction is given in wood turning, intended to acquaint the student with the use of the tools and the ordinary operations of wood turning. The tools are furnished by the department. The charge for materials is $5.00 a term.

Six hours a week for sixteen weeks. MR. WEBB.

6. FORGE WORK.—The work begins with the simple operations of drawing and upsetting. Then follows the welding of straight pieces of various sizes, the making of rings, and chain links, the welding of eye bolts and bolt heads, etc. Each student makes from steel a center punch, cold chisels, and a full set of lathe tools, which are finished and tempered for future use in the machine shop. Each student is required to furnish a forging hammer, calipers and square at a cost of $2.50. The charge for materials is $5.00 per term. As a part of this course instruction is given in foundry work. Moulding and pouring are done by the student under the instruction of a practical foundryman. The tools are furnished by the college. No charges are made.

Seven and a half hours a week for twenty weeks. MR. WEBB.

7. ANALYTIC MECHANICS.—Elementary principles and definitions; composition and resolution of forces; center of gravity; friction, virtual velocities; elementary machines; work and energy; moment of inertia.

The text-book is Bowser's Analytic Mechanics. *Five hours a week for twenty-six weeks.* MR. WEBB.

8. KINEMATICS.—This subject is studied with reference to the construction of cams, lobed wheels and gear teeth. The various methods by which one kind of motion may be transformed into another are investigated and analyzed, and then illustrated by the solution of practical problems. The construction of cycloidal and involute gears is studied both theoretically and practically by means of problems and models.

The text-book is McCord's Kinematics. *Five hours a week for sixteen weeks.* PROF. FLINT.

9. LINK AND VALVE MOTION.—The design and proportion of engine cylinders, steam pipes, and ports; the design and working of engine valves; the setting of eccentrics; adjustable eccentrics; the design and working of the locomotive link motion with its connections. Problems in slide valve and locomotive link motion are worked out in the drawing room.

The text-book is Auchincloss's Link and Valve Motion. *Four hours a week for sixteen weeks.* MR. WEBB.

10. MACHINE WORK.—This course commences with exercises in filing and chipping, which occupy from thirty to forty hours. The following work consists of ordinary lathe work, drilling, boring and threading in the lathe, making cut gears, machinist's taps, finished bolts, and exercise on the planers and shaper. In addition to the tools procured and made while in the forge shop, each student is required to provide himself with centre guage, steel scale, and a set of files at a cost of $2.50. The charge for materials is $5.00 a term.

Twelve and one-half hours a week for thirty-six weeks. MR. WEBB.

11. MACHINE WORK.—This course is in all general features like Course 10, but shorter in time in order to allow the student opportunity to elect a course in physics.

Seven and a half hours a week for thirty-six weeks. MR. WEBB.

12. STEAM ENGINE.—The steam engine is studied with reference to its adaptability as a prime mover or source of power. The various details of a steam engine are calculated and drawings of them are made. The results are compared with those of the best practice. The student is given a thorough drill with the indicator; by means of diagrams he is taught to determine the setting of valves, to calculate the horse power, and to estimate the water consumption, and the number of pounds of coal required

per horse-power per hour. This study makes the student familiar with the indicator and planimeter, and the method of making efficiency tests of steam plants. One-third of the time is given to recitations and two-thirds to drawing.

The text-book is Mark's Steam Engine. *Five hours a week for sixteen weeks.* PROF. FLINT.

13. HYDRO-MECHANICS.—The behavior of liquids in motion and under pressure, flowing through pipes and open channels, with problems involving a large number of different conditions, is studied for its usefulness in determining the size of pipes suitable for various purposes.

The text-book is Bowser's Hydromechanics. *Five hours a week for six weeks.* PROF. FLINT.

14. STEAM BOILERS.—This course covers the characteristics of steam and its behavior in pipes and boilers, with particular attention to its action in the cylinders of engines. Problems involving the properties of saturated steam are solved; and the student is required to design a boiler suitable to run an engine under given conditions, and to make a complete set of detailed drawings for its construction. He is also required to calculate sizes of steam pipes and safety valves.

The text-book is Wilson's Steam Boilers. *Five hours a week for ten weeks.* PROF. FLINT.

15. TESTING.—Instruction is given in testing steam guages, boilers, etc. The department is supplied with apparatus for the purpose. The properties of the various metals and their behavior under tension and compression, are illustrated by the use of the testing machine.

Five hours a week for two weeks. PROF. FLINT.

16. STEAM ENGINE DESIGNING.—Drawings are made of the more important parts of the design worked out in Course 12.

Ten hours a week for sixteen weeks. PROF. FLINT.

17. STEAM BOILER DESIGN.—Drawings are made in detail after the calculations worked out in course 14.

Ten hours a week for eighteen weeks. PROF. FLINT.

MILITARY SCIENCE AND TACTICS.

PROFESSOR HERSEY.

The military instruction is under the charge of a graduate of the United States Military Academy, an officer of the regular army of the United States. The course has especial reference to the duties of officers of the line. Cadet rifles, ammunition and accouterments are furnished by the War Department. The students are organized into an infantry battalion of two companies, band, and a signal corps, officered by cadets selected for their character, soldierly bearing, and military efficiency. The battalion is instructed and disciplined in accordance with rules prescribed by the President of the United States for the guidance of officers of the regular army detailed for that purpose.

The trustees have prescribed that the uniform shall be a dark blue blouse with gold braid on cuffs, and State of Maine buttons; trousers of lighter blue; blue cap, with gold wreath ornament; and white duck trousers for hot weather. Cadets are required to wear their uniforms during the military exercises, and they may wear them about ordinary college work. The uniform is a neat and serviceable suit and costs about eighteen dollars. The uniform overcoat is of dark beaver, of ulster length, with broad, falling collar and detachable cape. The coat costs about sixteen dollars, and will suitably take the place of any other overcoat. This overcoat is prescribed as a part of the uniform, but the students are not compelled to buy it if no overcoat is needed.

On graduation, the names of such cadets as have shown special aptitude for military service are reported to the Adjutant General of the United States Army and to the Adjutant General of Maine. The names of the three most distinguished are inscribed in the United States Army Register and published in General Orders to the Army.

At graduation a cadet who has satisfactorily completed his course in Military Science receives a certificate of military proficiency with his diploma.

1. PRACTICAL COURSE.—(a.) Infantry Exercises begin with "setting up" exercises and military gymnastics, and continue with manual of arms and bayonet exercise. School of company, school of the battalion, and extended order movements follow. (b.) Target practice at known distances up to six hundred yards, and skirmish firing over range of six hundred yards. Marksman's buttons are awarded to cadets who qualify. (c.) Military signalling with flag, lantern, heliograph, and field telegraph. (d.) Band Practice. (e.) One Week is spent in Camp. Cadets are instructed in the duties of a sentinel, make practice marches

of from five to fifteen miles daily, learn advance guard and outpost duties, make hasty fortifications, and work out practically the problems of minor tactics.

Three hours a week for thirty-six weeks each year.

2. MILITARY SCIENCE.—Recitations on U. S. Infantry Drill Regulations and Manual of Guard Duty.

One hour a week for thirty-six weeks.

3. MILITARY SCIENCE.—Lectures and recitations on military science, including organization, administration, discipline and instruction of armies; logistics; security and information; manufacture and use of gunpowder; high explosives; small arms; cannon; projectiles; armor; mines and torpedoes; construction of military bridges and destruction of bridges, roads, etc.; coast defences; military law and military history; closing with studies on campaigns illustrating the principles of the art of war.

The text-book is Caleff's Notes on Military Science. *One hour a week for thirty-six weeks.*

4. ESSAYS.—Each member of the Senior Class is required to submit an essay at the beginning of the spring term on a military subject, preferably allied to his other college work.

5. PHYSICAL TRAINING.—In connection with the work of this department, the members of the Freshman Class are given a course in physical training, under the personal direction of the Professor of Military Science. The aim is to secure a symmetrical development of the muscular system, and to arouse a pride in firm muscles, a clear skin, and an upright carriage. At the beginning of the course each student is examined and measured to discover physical defects, and individual exercises are prescribed for their correction. The work required of all members of the class comprises free movements, sand bag exercises, deep breathing exercises, practice with dumb bells, wands, and Indian clubs.

Two and a half hours a week for thirty-six weeks.

THE SHORT COURSES.

THE SHORT COURSES IN AGRICULTURE.

The short courses in agriculture are designed for those who wish to become farmers and can devote but limited time to study, and desire to return at once to the active operations of the farm. They are planned so as to give the greatest amount of available and directly useful knowledge that can be acquired in the time allowed. In order to adapt them to the varying conditions of preparation and of time that can be given, two courses are offered, one extending over two college years, the other over a single college year. The former affords a wider range of study and practice, but the latter in its narrower range offers a plan of systematic study on prominent and important agricultural subjects. Students must come to these courses with at least a good common school education, and be not less than fifteen years of age. No maximum limit of age is fixed. Formal entrance examinations are not required, but the College reserves the right to reject any students who show a lack of fitness to pursue with success the course selected.

THE SHORT COURSE IN PHARMACY.

A two years' course in pharmacy will be provided for those who are not able to take the four years' course. Upon completing it the student will receive a certificate.

THE COURSE IN LIBRARY ECONOMY.

This course is designed to give training for the profession of the librarian, and to furnish to persons fond of books opportunity to become familiar with them and their history. It is not a part of any of the regular courses, but is expected to occupy all, or the greater part, of the time of the student for one year. The student may, however, obtain the consent of the Faculty to attend other courses of instruction in the college. There will be recitations, accompanied by practical work in the cataloguing and classifying of books, elementary work in bibliography, and

in the history of foreign literatures, and lectures on the details of library administration. It is intended to make the course thoroughly practical, and it is expected that those who complete it will be fitted to take charge of small libraries, or departments in larger libraries. For conditions of admission, candidates should correspond with the librarian. There will be no charges except those for materials consumed. Those who complete the course satisfactorily will receive a certificate certifying to that effect.

THE SUMMER SCHOOL.

A summer school, especially intended for teachers, will be opened on the second Wednesday of July, 1894, if there should prove to be sufficient demand for it on the part of those for whose especial benefit it is planned. All the laboratories of the College will be opened and in operation under the charge of competent instructors, in most cases members of the Faculty. Other departments will also be organized. Those who wish further information may obtain circulars with detailed statement of courses by applying to Prof. James S. Stevens, Ph. D., or to the President of the College.

THE TRAINING SCHOOLS.

THE TRAINING SCHOOL IN GENERAL AGRICULTURE.

This course is designed to meet the needs of practical farmers and of young men expecting to become farmers, who are unable to devote a longer time to preparatory study. It begins on the first Wednesday in December in each year, and continues for twelve consecutive weeks. The instruction includes lectures and recitations upon agricultural chemistry, animal industry, dairy husbandry, horticulture, veterinary science, agricultural engineering, entomology, and business law.

THE DAIRY SCHOOL.

This course is planned to prepare in the most practical manner those who expect to act as managers of creameries or to conduct large private dairies. It begins on the second Wednesday in December of each year, continuing for four consecutive weeks, and will consist of lectures on the constitution of milk, the conditions which affect the creaming, churning, and preserving of milk; the heating, ventilation, and physical problems connected with the dairy; the management of boilers and engines; the care of tools and machinery; the diseases of the cow; feeding and breeding; and very largely of actual practice in the dairy building, in milk testing and butter making.

THE TRAINING SCHOOL IN CARPENTRY.

This course is intended for carpenters and those who propose to become carpenters. It will begin on the first Wednesday in December of each year, and continue for twelve consecutive weeks. Candidates for admission must be not less than fourteen years of age and have a good common school education. The course will include the use of the ordinary hand tools and the lathe, the care of tools and machinery, filing of metal, business law, including the making of contracts, the drawing of specifications, etc.; exercise in the framing of buildings from specifications, mechanical drawing; the use of simple surveying instruments for the laying out of buildings, explanations of the most useful elementary principles of the higher mathematics, and one course not closely related to technical work, but intended to awaken and develop the intellectual powers.

EXPENSES IN THESE COURSES AND SCHOOLS.

No charge is made for tuition. Each student in the course in library economy pays for materials used. Each student in the training school in carpentry will pay for materials used, and for his part of the running expenses of the shops The charge should not exceed five dollars in either case. The student in the training school in general agriculture and in the dairy school, will provide himself with two suits of white duck clothes. These can be obtained in Orono for $1.00 each.

The principal expense will be for rooms and board. Male students in the library course or in the short courses in agriculture will be provided with rooms in the College dormitory without charge. Free rooms cannot be supplied for women students, but rooms may be obtained in the village at very small prices. Students in the training schools will be accommodated with rooms in the College dormitory if any are vacant, otherwise they must find rooms in the village. During term time, all students may obtain board in the College boarding house, but during the vacation they must find board in the village, or at neighboring houses, unless a sufficient number may present themselves to justify the opening of the boarding house. Students in the dairy school will be furnished with rooms free of charge. The College will undertake to furnish rooms and board during four weeks for not more than twenty-five students in the dairy school at a fixed charge of fifteen dollars each. The students must supply their own bedding. Board and room may be obtained in the village at prices varying from three to four dollars per week.

ADMISSION.—Students must be at least fifteen years of age, and have a good common school education. Formal entrance examinations are not required, but those who lack proper preparation cannot reap the full benefits of the courses.

THE EXTENSION COURSES.

The extension courses are planned with the desire to make the College as widely useful as possible in spreading information, and in stimulating study and investigation. They are intended more especially for those who for reasons of age, limited leisure, or lack of funds are prevented from attending the full courses of the College, and are an attempt to take the College to those who are unable to come to it. They consist of systematic home readings, and series of lectures to be delivered at convenient centers throughout the State.

THE COURSES OF READING.

Special circulars in regard to these courses will be sent to those who apply for them. Courses in agriculture and political economy have been formulated, and courses in other lines in which the work of the College lies will be prepared.

THE LECTURE COURSES.

These courses consist of series of lectures by the same person, not less than five each, on closely connected topics or on portions of the same topic. They are delivered by members of the Faculty and the subjects and methods of treatment pursued are those used at the College. The lectures should be delivered at intervals of one or two weeks, and preferably on Friday or Saturday evenings, in order not to disarrange the home work of the instructors. The purpose of these courses is to instruct, lay out lines of work, quicken intellectual effort, and lead to investigation. They must not be confounded with popular lectures for entertainment, or courses consisting of individual lectures on disconnected subjects. In order that the maximum advantage may be derived from these lecture courses, it is desirable that reading courses be established in connection with them. Material for this reading will be recommended by the lecturers in the respective courses, or supplied in the form of pamphlets at a nominal price. Quizzes and discussions will be held, just before or after each lecture. Ques-

tions inviting answers in writing will be proposed from week to week. A printed syllabus of the lectures will be furnished, and final examinations will be given to those who desire them. These courses are intended primarily for those who seek them for purposes of instruction, taking part in the quizzes, and pursuing the reading courses in connection with them, but others who attend merely for the purpose of hearing the lectures are welcome.

EXPENSES.—When a course is desired, it will be found wise first to effect a local organization to conduct the business of the course. The local organization will be expected to pay all the expenses, including the lecturer's travelling expenses, the rental of hall, furnishing of tickets, lights, etc.

THE FARM COURSE.

The farm course, although properly a part of the extension work of the College, is given, for purposes of convenience, a separate name, and is treated by itself. It differs from the other courses in that it relates entirely to agriculture and largely to practical matters, and that the series of lectures is a longer one and delivered by more than one person. It consists of one, two, or three lectures each day for two weeks. The subjects of the lectures offered during the present year are stated in detail below. The courses begin as early in the fall as desired and continue until about the first of April. They will be held wherever a class of sufficient size—at present, fifteen is regarded as sufficient—can be got together under an agreement to attend the meetings of the class regularly, and to pay the expenses involved. The expenses depend largely upon the distance which the lecturer must travel. They can be reduced when two courses are carried on at the same time in adjacent places. This can be done conveniently when it is possible to deliver morning or afternoon lectures in one place and evening lectures at the other. It is the intention to illustrate the subjects under discussion as fully as possible by the use of charts, pictures, lantern slides, apparatus, and specimens. The more important apparatus, such as the Babcock milk test, can be shown in actual operation. Reading courses on parallel lines are provided. Quizzes and examinations will be provided for those who desire them. The courses are open to men and women alike.

LIST OF LECTURES.

1 and 2. CATTLE BREEDING.—Origin of domesticated cattle; principles and laws of breeding; agencies effecting variation; judging by scales of points. Illustrated. PROF. GOWELL.

3 and 4. CATTLE FEEDING.—Nutritive processes; effects of the different properties of plants in nutrition; feeding standards; formulating rations; sources of cattle foods and their composition. PROF. GOWELL.

5 and 6. DAIRYING.—Milk formation and composition; ferments; testing for fat and other solids; milk and cream handling and curing; butter and cheese making; judging by scales of points. Illustrated. PROF. GOWELL.

7 and 8. PLANT NUTRITION.—Composition of plants; sources of plant food. Illustrated. PROF. BALENTINE.

9 and 10. FARM MANURES.—Composition; preservation, losses in handling; methods of application. Illustrated. PROF. BALENTINE.

11 and 12. COMMERCIAL FERTILIZERS.—Sources of crude materials; preparation; composition; economies in mixing and applying. Illustrated. PROF. BALENTINE.

13. ORIGIN OF SOILS.—Disintegration of rocks,—chemical and physical causes; kinds of rocks,—limestones, sandstones, clay, etc.; classification of soils, their composition and mechanical condition; characteristics of a good soil; soils for special purposes. Illustrated. PROF. HARVEY.

14. INJURIOUS INSECTS.—History, description; nature of injuries; remedial measures. Illustrated by charts, models, and microscopical slides. PROF. HARVEY.

15. BACTERIA.—Nature and organization; effects, beneficial and injurious, in producing fermentation, and diseases of plants and animals; remedial measures. Illustrated by charts, models and microscopic slides. PROF. HARVEY.

16. SMALL FRUITS.—Propagation; culture; picking; marketing; winter protection; uses; varieties. PROF. MUNSON.

17. ORCHARD CULTURE.—Starting an orchard; care of trees; picking and marketing fruit; pruning; grafting and budding; varieties. Illustrated. PROF. MUNSON.

18. MARKET GARDENING.—Location; soil and aspect; methods of culture; implements; storing and marketing; gardening in winter. Illustrated. PROF. MUNSON.

19. THE HOME PLACE.—Care of grounds; what, when and how to plant; arrangement of trees and shrubs; window gardening; flowers for the home. PROF. MUNSON.

20. PLANT LIFE ON THE FARM.—The processes of germination; growth, development; the nature and functions of roots and leaves; the movement of sap; influence of light, heat, moisture, soil; practical applications. PROF. MUNSON.

21 and 22. ENEMIES AND DISEASES OF PLANTS.—Common insect enemies; coddling moth, tent-caterpillar, canker worm, etc.; fungous and bacterial diseases,—apple scab, black knot, pear blight, etc.; insecticides and fungicides; spraying apparatus; results of spraying. Illustrated. PROF. MUNSON.

THE AGRICULTURAL EXPERIMENT STATION.

The Agricultural Experiment Station of the Maine State College owes its existence to the passage by Congress of an act, popularly known as the Hatch Act, which became a law on March 2, 1887. This act specifically provides that the Station shall be a department of the College. As such it has been organized and therefore sustains the same relation to the governing board as the departments of instruction.

Such are the conditions, however, under which this department was created, placing it in peculiar and intimate relations with the agriculture of the State, and so essential is it to satisfy the general government that the lines of work and expenditure of funds are in accordance with the terms of the law, that the Station has an administration and equipment which appear to place it somewhat apart from the general body of the institution.

The affairs of the Station, excepting the selection of its officers, are considered by a Station Council, which consists of a committee of the Trustees of the College, the President of the College, members of the Station Staff, and representatives from the State Board of Agriculture, the State Pomological Society and the Patrons of Husbandry. This Council is advisory in its capacity and refers the results of its deliberations to the Trustees for ratification. In this way a decision is reached as to the experiments and investigations to be undertaken, and the distribution of the expenditures in various directions, otherwise than salaries.

The Station Staff includes eleven persons: A director, two chemists, one agriculturist, a botanist and entomologist with an assistant, a veterinarian, a horticulturist with an assistant, a foreman of experimental work in the field and barn, and a stenographer and clerk. Six of these persons devote themselves entirely to Station matters, while five give a part of their time to the instruction of students.

LABORATORY OF THE EXPERIMENT STATION.

The appliances which the Station has at its command consist of a principal building which contains the office and chemical and bacteriological laboratories fairly well equipped with apparatus, a finely constructed forcing house 65 by 18 feet, devoted to the study of plant nutrition, a part use of another forcing house 100 by 20 feet for general horticultural experiments, rooms for photographic work, meteorological apparatus, an unusually well built barn 100 by 40 feet convenient for digestion and feeding experiments with both cattle and swine, twenty-five acres of land occupied by general field experiments, a few acres set with large and small fruits, a vegetable garden, farm, garden and dairy apparatus, and a varying number of experimental animals. A certain amount of fruit has been set in several localities in the State, which is under the general supervision of the Station Horticulturist.

The Station receives $15,000 annually from the general government which is supplemented by a small sum derived from the sale of farm and garden products.

The act of Congress declares that these experiment stations shall be established "in order to aid in acquiring and diffusing among the people of the United States useful and practical information on subjects connected with agriculture, and to promote scientific investigation and experiment respecting the principles and application of agricultural science." This general purpose is to be accomplished by making it "the object and duty of said experiment stations to conduct original researches or verify experiments" along various lines which are specified somewhat in detail, but which considered broadly relate to plant and animal nutrition, plant and animal diseases and pests, and the technics of the various methods involved in crop production and animal husbandry. The Maine Experiment Station is therefore by legal enactment, as it is believed to be in fact, a department of experiment and investigation. Its true purpose is evidently not to give that sort of instruction for which provision is made in the agricultural departments of the "land grant" colleges, but rather to enlarge the domain of that scientific knowledge which is intimately related to the art of agriculture and to disseminate the facts which it may acquire in such a manner as to most generally and safely secure for them their proper place in agricultural practice.

It is certainly incumbent upon this Station to shape its work with reference to the special features and needs of Maine agriculture. An effort has been made to do so, and as Maine is one of the older states, the fertility of whose soil is somewhat impaired, and as stock husbandry in general, and more especially dairy husbandry, is to an increasing extent the farmer's main reliance under the conditions which prevail in this State, the activi-

ties of the Station have heretofore largely related to fertilizers, plant and animal nutrition, and to the problems which pertain to the production and handling of milk. Orcharding and market gardening occupy an important place in the plans of work and the diseases and pests of plants and animals are given much attention.

The publications of the Station consist of annual reports and frequent short bulletins. The latter are intended to convey to farmers, in a form adapted to popular comprehension, all the results that in any way relate to farm practice.

The annual reports, on the other hand, are expected to contain a fuller statement of the proceedings of the Station, involving to some extent the technical language of science, with a completeness of data that might be bewildering to those not accustomed to a close analysis of language and facts. These reports will include nothing of value to practical agriculture not set forth in the bulletins.

All station bulletins are sent to farmers on request, free of expense. The annual reports are sent only when a statement is made that they are especially desired.

THE FIELD DAY.

One day in each year is known as the Field Day of the agricultural department. The usual college exercises are omitted and all departments are thrown open to visitors. Especial effort is made to exhibit the facilities of the agricultural department in the most thorough manner. Special rates are obtained on the railroad for those who come from a distance. The attendance has ranged from fifteen hundred to two thousand persons. The program includes informal talks by the professors in regard to the collections, demonstrations with some of the more important apparatus, exhibitions of improved agricultural machinery, the operation of the dairy building, an exhibit of agricultural products, tools, and supplies contributed by manufacturers and dealers. Tests of new agricultural machinery are made. The field experiments of the Experiment Station are explained by the investigators.

In the afternoon the cadets give an exhibition drill, and later a meeting is held in the chapel. Addresses are made by representatives of the Board of Trustees, the Faculty of the College and the various important agricultural organizations, and by other distinguished visitors. The certificates to be awarded to those completing the farm course and other extension courses in agriculture will be awarded at this meeting. Circulars in regard to Field Day may be obtained by addressing the Professor of Agriculture.

THE GOVERNMENT OF THE COLLEGE.

The College is maintained at public expense for the public good. Those who participate in its benefits should therefore be required to fulfill faithfully their obligations as loyal members of the institution, of the community and of the commonwealth. All students owe to the public for its expenditure in their behalf an equivalent in the form of prompt performance of duties and of superior usefulness. As members of the community they are amenable to the law. The College recognizes its relation to the commonwealth as a State institution and a part of the State government, and will in no case shield students from the consequences of any acts in violation of the State laws. This attitude is expressly recognized and commanded by an act of the Legislature which requires that in the case of offences against the public order students, like other persons, shall be held responsible for their deeds by the officers of the law. The College will obey this command of the State both loyally and faithfully, and not only refrain from placing any obstacles in the way of the execution of the law, but on the contrary do everything proper to assist in its administration.

THE COLLEGE REGULATIONS.

The College Regulations for the government of the College in regard to the selection of studies, standings and grades, absences from recitations and examinations, rhetorical exercises, entrance conditions, leave of absence, attendance upon church and chapel, penalties, examinations and athletics are printed in full in the annual report of the President for the calendar year ending December 31, 1894.

By these regulations, the quota of regular studies for each student is made to be such as to require, for a minimum, seventeen hours, and, for a maximum, twenty hours of class room work each week. In the application of this rule, two hours of laboratory work and of other exercises not requiring preparation, count as one. The character of the work of members of the Sophomore

and Freshman classes is announced by numerical standings on a scale of one hundred. Only the general character of the work of members of the Senior and Junior classes is reported by assigning each student to one of four grades.

Excuses for absence from individual exercises are not required. Each student is expected to pursue his work in a manly way, absenting himself from college exercises only when he has sufficient reasons for doing so. Of these reasons he is to be the judge, but a student who is absent from ten per cent or more of the exercises in any study, is not admitted to the final examination. A student who fails to pass at any examination, is absent or is excluded from any examination will have two opportunities to take special examinations in the study, one immediately before the beginning of each of the next two succeeding terms. If he is absent without sufficient reason from both of these special examinations, or fails to pass at one or the other, he is required to recite with the next class.

EXPENSES.

No charge is made for tuition. Rooms in Oak Hall, the College dormitory, are free. The charges for heating and service vary according to the actual cost to the College. The cost of heating a room in the dormitory suitable for two persons is about ten dollars for each of the two terms. The incidental charges for heating and care of public rooms, services of janitor, etc , are about twenty-five dollars per annum. The students in the laboratories and shops pay small fees, to cover cost the of material used.

BOARD.

As the College is located more than a mile from each of the villages of Orono and Stillwater, the College maintains a boarding-house for the convenience of those students who choose to board there. The boarding-house is in charge of Mr. Aaron E. Spencer, the steward. No efforts are spared to provide wholesome and palatable fare, with good service, at the most reasonable prices. The price of board for each term is fixed so as to cover expenses for service, materials and preparation. No charge is made for rental or repair of buildings.

THE LIBRARY AND READING ROOM.

The library in Coburn Hall contains about nine thousand bound volumes and many pamphlets. It is open during the morning of every day except Sunday, during the afternoon of every day except Tuesday and Thursday, and during the evenings of Tuesday and Thursday. Students are allowed direct access to the shelves.

A reading room located on the first floor of Oak Hall is provided with the principal daily and weekly newspapers. The library reading room in Coburn Hall contains the current issues of the most important magazines and reviews, literary and scientific, American and foreign.

ORGANIZATIONS.

THE COLLEGE ASSOCIATIONS.—The following associations for literary and other purposes exist among the students: The Q. T. V. Fraternity, The B. Θ. Π. Fraternity, The K. Σ. Fraternity, The A. T. Ω. Fraternity, The Civil Engineering Society, The Young Men's Christian Association, The Literary Society, The Athletic Association, The Maine State College Publishing Association, The Maine State College Electrical Society, The Reading Room Association.

THE YOUNG MEN'S CHRISTIAN ASSOCIATION.—The Young Men's Christian Association, composed of students, has for its object the promotion of Christian fellowship among its members and aggressive Christian work. Among its members are leaders in the athletic, social and intellectual life of the College. This united effort of the Christian young men to elevate the moral, social and spiritual life of the students has the hearty support of the Faculty. The Association maintains throughout the College year a series of lectures by eminent clergymen of the State, members of the Faculty, and other persons.

THE ALUMNI ASSOCIATIONS. — The following associations of the alumni have been organized: THE EAST MAINE ASSOCIATION—E. M. Blanding, Bangor, *President*. THE WEST MAINE ASSOCIATION—S. W. Bates, Portland, *President;* E. H. Elwell, Portland, *Secretary*. THE BOSTON ASSOCIATION—L. C. Southard, *President*. THE NEW YORK ASSOCIATION—A. J. Caldwell, *President;* L. W. Riggs, *Secretary*. The general alumni association holds an annual meeting at Orono during Commencement week. Its officers are as follows:

THE GENERAL ALUMNI ASSOCIATION.

H. M. ESTABROOKE, PRESIDENT, *Orono*.
FRED P. BRIGGS, RECORDING SECRETARY, *Orono*.
RALPH K. JONES, CORRESPONDING SECRETARY, *Findlay, Ohio*.
J. N. HART, TREASURER, *Orono*.
L. H. MERRILL, NECROLOGIST, *Orono*.

CLASS SECRETARIES.

E. J. HASKELL, ... CLASS OF 1872, ... *Westbrook.*
J. M. OAK, ... CLASS OF 1873, ... *Bangor.*
W. BALENTINE, ... CLASS OF 1874, ... *Orono.*
E. F. HITCHINGS, ... CLASS OF 1875, ... *Bucksport.*
E. M. BLANDING, ... CLASS OF 1876, ... *Bangor.*
S. W. GOULD, ... CLASS OF 1877, ... *Skowhegan.*
JOHN LOCKE, JR., ... CLASS OF 1878, ... *Portland.*
F. E. KIDDER, ... CLASS OF 1879, ... *Denver, Col.*
A. H. BROWN, ... CLASS OF 1880, ... *Old Town.*
H. M. PLAISTED, ... CLASS OF 1881, ... *St. Louis, Mo.*
W. R. HOWARD, ... CLASS OF 1882, .. *Saxton's River, Vt.*
L. W. TAYLOR, ... CLASS OF 1883, ... *Pittsfield.*
G. H. ALLEN, ... CLASS OF 1884, ... *Portland.*
J. N. HART, ... CLASS OF 1885, ... *Orono.*
R. K. JONES, ... CLASS OF 1886, ... *Findlay, Ohio.*
D. W. COLBY, ... CLASS OF 1887, ... *Orono.*
T. G. LORD, ... CLASS OF 1888, ... *Skowhegan.*
NELLIE W. REED, ... CLASS OF 1889, ... *Stillwater.*
N. C. GROVER, ... CLASS OF 1890, ... *Orono.*
H. G. MENGES, ... CLASS OF 1891, ... *Bangor.*
G. F. ATHERTON, ... CLASS OF 1892, ... *Cape Elizabeth.*
G. F. ROWE, ... CLASS OF 1893, ... *Bangor.*

THE COLLEGE PUBLICATIONS.

The College publications are as follows:

THE ANNUAL CATALOGUE OF THE MAINE STATE COLLEGE.—This contains statements of the courses of study, lists of the trustees, faculty, and students, and other information relating to the College.

THE ANNUAL REPORT OF THE TRUSTEES, PRESIDENT, AND TREASURER TO THE GOVERNOR AND COUNCIL OF THE STATE OF MAINE.—The reports of the Trustees and President include an account of the general affairs and interests of the College for the year, reports from the heads of the various departments of instruction, and the report from the director of the Experiment Station covering in detail its expenses, operations, investigations, and results.

THE COLLEGE BULLETINS.—These are occasional publications containing reports of the investigations or researches made by the College officers, or other information relating to the College of public interest.

THE EXPERIMENT STATION BULLETINS.—These are popular accounts of the results of Station work which relate directly to farm practice. At least four and usually twelve are issued each year.

THE CADET.—This is a monthly newspaper published during the College year by an association of the students. It is devoted to the interests of the College, its students, and alumni.

THE PRISM.—This is an annual published by the Junior Class. It contains information in regard to the College and its various organizations, and is elaborately illustrated.

COMMENCEMENT.

Degrees Conferred at the Commencement in 1893.

At the Commencement in June, 1893, the first degree was conferred in course on the following persons as shown:

Hosea Ballou Buck, B. C. E., Stillwater.
Walter Wilson Crosby, B. C. E., Bangor.
Charles Frederick French, B. M. E., Glenburn.
Charles Henry Gannett, B. C. E., Augusta.
George Weymouth Hutchinson, B. C. E., Orono.
Walter Dows Jack, B. S., Topsham.
Charles Prentiss Kittredge, B. S., Milo.
Hugh McLellan Lewis, B. C. E., South Berwick.
Charles Clark Murphy, B. C. E., Hampden.
George Freeman Rowe, B. M. E., Bangor.
Orrin John Shaw, B. C. E., Hampden.
Harry Maubec Smith, B. M. E., Bangor.
John Milton Webster, B. S., Augusta.
George Ansel Whitney, B. M. E., Madison.
Hiram Williams, B. S., Portland.

The second degree was conferred on the following persons upon presentation of satisfactory theses and proof of professional and scientific work extending over a period of not less than three years:

Francis Stephen Brick, M. S., Bernardston, Mass.
Frank Edwin Emery, M. S., Raleigh, N. C.
Chandler Cushman Harvey, C. E., Fort Fairfield.
Arthur Dean Page, C. E., St. Cloud, Minn.
Frank Adelbert Smith, C. E., St. Cloud, Minn.
Winfield Scott Webb, C. E., Gallitzin, Penn.
Nathaniel Estes Wilson, M. S., Reno, Nevada.

SCHOLARSHIPS AND PRIZES.

SCHOLARSHIPS.

The trustees have decreed that any person who shall pay to the treasurer a sum not less than seven hundred and fifty dollars for the endowment of a scholarship may have the privilege of assigning to it such name as he may prefer.

THE KIDDER SCHOLARSHIP. — The Kidder Scholarship was endowed by Frank E. Kidder, C. E., of Denver, Colorado, a graduate of this College in the class of 1879, to be awarded to a member of the Junior class to be selected by the President and the Faculty of the College.

PRIZES.

The following prizes will be awarded during the present year:—

THE PRENTISS PRIZE, the gift of Mrs. Henry E. Prentiss of Bangor, will be awarded to that member of the Junior class who shall present the best oration at the Junior exhibition. In the award of this prize both the composition and the delivery of the oration will be considered.

THE PRENTISS DECLAMATION PRIZE, the gift of Mrs. Henry E. Prentiss of Bangor, for excellence in elocution, will be awarded to the best speaker in the Sophomore class.

THE LIBBEY PRIZE, the gift of the Honorable Samuel Libbey of Orono, will be awarded to the student who shall present the best essay upon an agricultural topic. The essays must be handed to the Professor of Agriculture on or before the first Monday in June.

THE FRANKLIN DANFORTH PRIZE, the gift of Eugene F. Danforth of Skowhegan, a graduate of the College in the class of 1877, in memory of his father, Franklin Danforth, will be awarded to that member of the Senior class in the Agriculture course who shall attain the highest standing.

THE SOPHOMORE STANDING PRIZE, the gift of a friend of the College who wishes to remain unknown, will be rewarded to that member of the Sophomore class who shall attain the highest standing.

THE FRESHMAN STANDING PRIZE, the gift of a friend of the College who wishes to remain unknown, will be awarded to that member of the Freshmen class who shall attain the highest standing.

MENTION FOR MILITARY EXCELLENCE.—In accordance with the orders of the Adjutant General of the United States Army, the two cadets who attain the highest standing in the military department are reported to his office immediately after commencement, and their names are printed in the U. S. Army Registry.

The Prizes were awarded last year as follows:

The Prentiss Prize, to Herbert Murray of Rockland.

The Prentiss Declamation Prize, to Oscar Llewellyn Grover of Redlands, California.

The Libbey Prize, to Charles Prentiss Kittredge of Milo.

The Franklin Danforth Prize, to Harris Perley Gould of North Bridgton.

The Sophomore Standing Prize, to Ora Willis Knight of Bangor, and Earl Clinton Merrill of East Eddington.

The Freshman Standing Prize, to Charles Partridge Weston of Madison.

The military mention for highest standing in the military department was made of Cadet Major Walter Wilson Crosby of Bangor, and Cadet First Lieutenant and Quartermaster George Ansel Whitney of Madison.

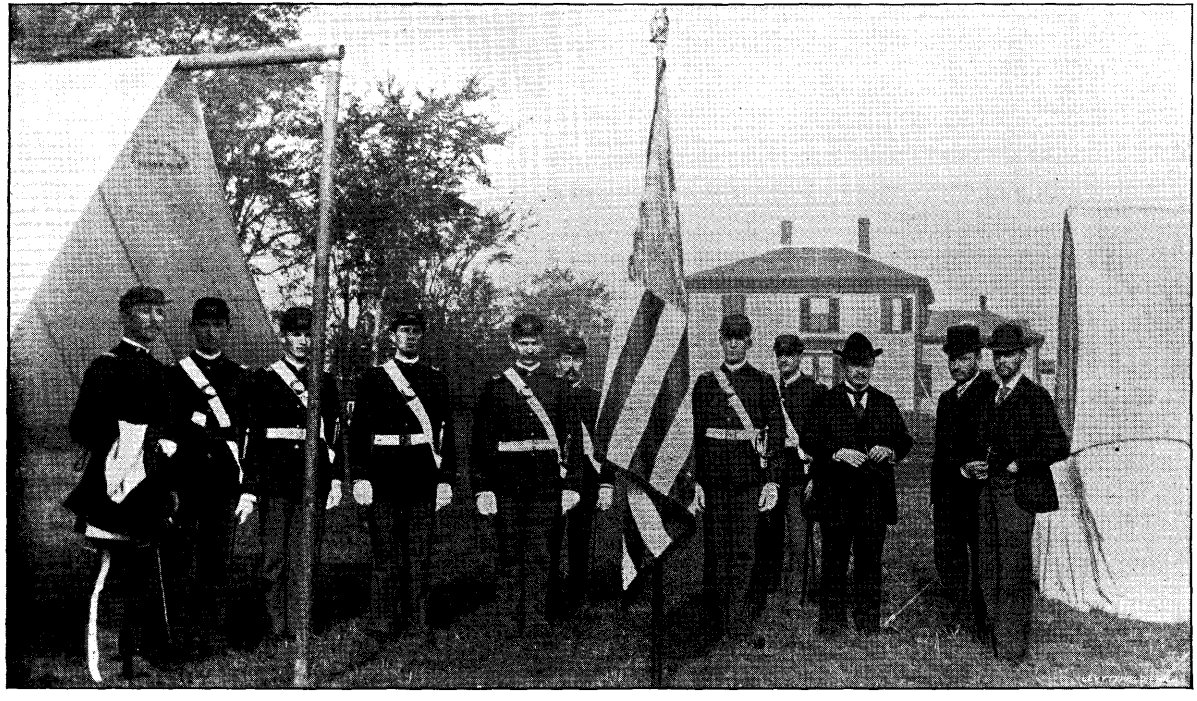
THE KITTREDGE LOAN FUND.

This fund, amounting to nearly one thousand dollars, was established by Nehemiah Kittredge of Bangor. It is in the control of the President and Treasurer of the College, by whom it is loaned to needy students. In the deed of gift, it was prescribed that no security should be required further than personal notes bearing interest at the prevailing rate. Loans are made on the conditions that the interest shall be paid promptly, and that the principal shall be returned from the first earnings after graduation.

MISCELLANEOUS INFORMATION.

PUBLIC WORSHIP.—Religious services of a simple character are held in the College chapel every morning except Saturday. All students are required to be present. Every student is required to attend one service on Sunday in one of the churches of the village. Voluntary religious services under the direction of the Young Men's Christian Association are held weekly.

LOCATION.—The College has a pleasant and healthful location between the villages of Orono and Stillwater, about three miles from the city of Old Town, and nine miles from the city of Bangor. The village of Orono is upon the Maine Central Railroad which gives easy access to all parts of the State. The Stillwater river, a tributary of the Penobscot, flows in front of the buildings, forming the western boundary of the College campus, and adding much beauty to the scenery.



IN CAMP—OFFICERS.

MILITARY ORGANIZATION.

OFFICERS AND NON-COMMISSIONED OFFICERS OF THE COBURN CORPS OF CADETS.

Second Lieutenant MARK L. HERSEY, 9th U. S. Infantry, Commanding.

FIELD AND STAFF.

Major—Cadet EDWARD B. WOOD.
First Lieutenant and Adjutant—Cadet FRANK G. GOULD.
First Lieutenant and Quartermaster—Cadet GEORGE H. HALL.

NON-COMMISSIONED STAFF.

Sergeant Major—Cadet EARL C. MERRILL.

COMPANY A.

Captain .....Cadet HERBERT MURRAY.
First Lieutenant .....Cadet LEON O. NORWOOD.
Second Lieutenant ....Cadet WALLACE H. JOSE.
First Sergeant .....Cadet HAROLD S. BOARDMAN.
Sergeant .....Cadet FRANK C. BOWLER.
Sergeant .....Cadet GEORGE P. COWAN.
Sergeant .....Cadet ORA W. KNIGHT.
Sergeant .....Cadet OSCAR L. GROVER.
Corporal .....Cadet FRANK L. MARSTON.
Corporal .....Cadet FREDERICK A. HOBBS.
Corporal .....Cadet BEECHER D. WHITCOMB.
Corporal .....Cadet HERBERT L. NILES.
Corporal .....Cadet EDWARD E. GIBBS.
Corporal .....Cadet JOSEPH W. RANDLETTE.

COMPANY B.

Captain ..... Cadet JAMES M. KIMBALL.
First Lieutenant..... Cadet EDWARD H. COWAN.
Second Lieutenant..... Cadet AUGUSTUS D. HAYES.
First Sergeant..... Cadet ALBION MOULTON.
Sergeant ..... Cadet WENDALL W. CHASE.
Sergeant ..... Cadet CHARLES D. THOMAS.
Sergeant ..... Cadet MELVILLE F. ROLLINS.
Sergeant ..... Cadet ——— ———.
Corporal ..... Cadet LEROY R. FOLSOM.
Corporal ..... Cadet PAUL D. SARGENT.
Corporal ..... Cadet PERLEY WALKER.
Corporal ..... Cadet CHARLES P. WESTON.
Corporal ..... Cadet FRANK E. WEYMOUTH.
Corporal ..... Cadet PERLEY B. PALMER.

COLOR GUARD.

Color Sergeant ..... Cadet ISAAC G. CALDERWOOD.
Cadet GEORGE W. RUMBALL.
Cadet LEROY T. DURHAM.

FIELD MUSIC.

Sergeant ..... Cadet JAMES W. MARTIN.
Corporal ..... Cadet STANLEY J. STEWARD.
Bugler ..... Cadet ALFRED H. BUCK.

CATALOGUE OF STUDENTS.

SENIOR CLASS.

Bowler, Frank Colburn,	*Orono*,	Rev. Mr. Bowler's.
Cowan, Edward Henry,	*Orono*,	Mrs. Cowan's.
Cowan, George Parker,	*Bangor*,	11 Oak Hall.
Durham, Leroy Tolford,	*Monroe*,	23 Oak Hall.
Gilbert, Charles Edward,	*Orono*,	Mr. Thomas Gilbert's.
Gould, Frank Gilman,	*Orono*,	Mrs. Gould's.
Gray, Jesse Alexander,	*Old Town*,	16 Oak Hall.
Hall, George Harry,	*Bangor*,	4 Oak Hall.
Harvey, James Elmore,	*Readfield*,	2 B. Θ. Π. House.
Hayes, Augustus Daniel,	*Belfast*,	8 Q. T. V. House.
Jose, Wallace Hight,	*Newport*,	5 Q. T. V. House.
Jordan, Alva Thomas,	*Lexington, Ky.*,	6 Q T. V. House.
Kimball, James Mayberry,	*Bangor*,	4 Oak Hall.
Murray, Herbert	*Rockland*,	6 Q. T. V. House.
Norwood, Leon Orlando,	*Union*,	Prof. Aubert's.
Rumball, George Washington,	*Harrington*,	14 Oak Hall.
Wood, Edward Butler,	*Camden*,	6 Q. T. V. House.

JUNIOR CLASS.

Boardman, Harold Sherburne,	*Bangor*,	3 B. Θ. Π. House.
Buck, Alfred Howard,	*Foxcroft*,	2 B. Θ. Π. House.
Calderwood, Isaac Glidden,	*Vinalhaven*,	6 Q. T. V. House.
Chase, Wendall Wyze,	*Auburn*,	2 B. Θ. Π. House.
Damon, Frank,	*Hampden*,	9 Oak Hall.
Duncan, Lindsey,	*Northfield, Mass.*,	29 Oak Hall
Ellis, Merton Eugene,	*North Guilford*,	8 Q. T. V. House.
Folsom, LeRoy Rowell,	*Corinna*,	9 Oak Hall.
Frost, Charles Albert,	*Monmouth*,	8 Q. T. V. House.
Grover, Oscar Llewellyn,	*Redlands, Calif.*,	Mr. Briggs'.
de Haseth, Gerardus Andries,	*Curacao, W. I.*,	5 Q. T. V. House.
Knight, Ora Willis,	*Bangor*,	Mrs. Graves'.
Martin, James William,	*Boston, Mass.*,	Mrs. Graves'.
Merrill, Earl Clinton,	*East Eddington*,	3 B. Θ. Π. House.

Moulton, Albion,	*Hiram*,	5 Oak Hall.
Murphy, Walter Marshall,	*South Norridgewock*,	15 Oak Hall.
Pattee, Clifford James,	*Belfast*,	8 Q. T. V. House.
Rollins, Melville Frederick,	*Bangor*,	13 Oak Hall.
Thomas, Charles Dura,	*Brownville*,	5 Oak Hall.

SOPHOMORE CLASS.

Black, Fred Frasier,	*Searsport*,	24 Oak Hall.
Buffum, Charles Nathaniel,	*Orono*,	5 B. Θ. H. House.
Farrell, Harry Clifford,	*Machias*,	18 Oak Hall.
Fernald, Roy Lynde,	*Winterport*,	5 B. Θ. H. House.
French, Frank Luther,	*Solon*,	Mrs. Cowan's.
Gibbs, Edward Everett,	*Bridgton*,	7 B. Θ. H. House.
Glidden, Everett Gray,	*Augusta*,	7 Q. T. V. House.
Gooch, Fred Burton,	*Yarmouth*,	36 Oak Hall.
Haley, George,	*Brownfield*,	24 Oak Hall.
Heywood, Heywood Hall,	*New York*,	1 B. Θ. H. House.
Hobbs, Frederick Andrew,	*Alfred*,	22 Oak Hall.
Jeffery, George Wesley,	*North Monmouth*,	36 Oak Hall.
Kidder, Elmer Elwood,	*Winslow*,	22 Oak Hall.
Lee, John Louis,	*Bangor*,	15 Oak Hall.
Manter, Ralph Barton,	*Milo*,	12 Oak Hall.
Marston, Frank Leonard,	*Bangor*,	3 Q. T. V. House.
Martin, Herman Stephen,	*Foxcroft*,	31 Oak Hall.
McLeod, Daniel James,	*Brewer*,	26 Oak Hall.
Niles, Herbert Lester,	*Levant*,	27 Oak Hall.
Palmer, Perley Burnham,	*South Bridgton*,	7 B. Θ. H. House.
Pride, Frank Perley,	*Westbrook*,	12 Oak Hall.
Randlette, Joseph William,	*Richmond*,	18 Oak Hall.
Rogers, Lore Alford,	*Patten*,	16 Oak Hall.
Sargent, Paul Dudley,	*Machias*,	5 Q. T. V. House.
Starr, John Alvah,	*Orland*,	7 Q. T. V. House.
Steward, Stanley John,	*Foxcroft*,	20 Oak Hall.
Tolman, Gilbert,	*Milo*,	12 Oak Hall.
Urann, Marcus Libby,	*Sullivan*,	13 Oak Hall.
Walker, Perley,	*Embden*,	4 Q. T. V. House.
Weymouth, Frank Edwin,	*Medford Center*,	20 Oak Hall.
Weston, Charles Partridge,	*Madison*,	4 B. Θ. H. House.
Whitcomb, Beecher Davis,	*Easton*,	25 Oak Hall.
Wilkins, Gardiner Benson,	*Brownville*,	25 Oak Hall.

FRESHMAN CLASS.

Albee, George Plummer,	*Richmond*,	17 Oak Hall.
Atwood, Edward Mosely,	*Hampden*,	21 Oak Hall.
Bass, George Willis,	*Brewer*,	Home.
Bird, Tyler Hanson,	*Belfast*,	22 Oak Hall.

Brastow, William Thomas,	*Rockport*,	4 Q. T. V. House.
Bryer, Charles Sydney,	*Boothbay*,	47 Oak Hall.
Brown, William Bourne,	*Jay*,	Mr. Spearing's.
Bunker, Stephen Sans,	*Bar Harbor*,	5 Q. T. V. House.
Chase, John Parks,	*Bath*,	4 B. Θ. II. House.
Clary, Justin Robert,	*Hallowell*,	4 Q. T. V. House.
Coburn, William Bridgham,	*Sherman Mills*,	Mr. Spearing's.
Cosmey, Stanwood Hill,	*Bangor*,	6 B. Θ. II. House.
Cowan, Arthur Sydney,	*Orono*,	Mr. Cowan's.
Crowell, Walter Newton,	*Beverly, Mass.*,	23 Oak Hall.
Dalot, Arthur John,	*Dalotville*,	3 Q. T. V. House.
Dow, Harry Eugene,	*Searsport*,	24 Oak Hall.
Farnham, Charles Henry,	*Beverly, Mass.*,	29 Oak Hall.
Flint, Bert Whitaker,	*Thorndike*,	31 Oak Hall.
Fowler, William Nichols,	*Searsport*,	17 Oak Hall.
Goodridge, Perley Francis,	*Orono*,	Mr. Goodridge's.
Gorham, Frank Edward,	*Round Pond*,	47 Oak Hall.
Goss, Austin Avery,	*Green's Landing*,	38 Oak Hall.
Heath, Stanley Jacob,	*Bangor*,	34 Oak Hall.
Holyoke, William Lawrence,	*Brewer*,	35 Oak Hall.
Knights, George Ernest,	*South Waterboro*,	36 Oak Hall.
Leavette, George Greenwood,	*South Berwick*,	Mr. Kinney's.
Macloon, Ernest Henry,	*Deering*,	6 B. Θ. II House.
Maxfield, William Alfred,	*Rumford Falls*,	35 Oak Hall.
Merrill, Edward Arthur,	*Winn*,	33 Oak Hall.
Patten, Andrew Jarvis,	*Cherryfield*,	20 Oak Hall.
Porter, Joseph White Humphrey,	*Stillwater*,	Home.
Porter, Byron Frank,	*Stillwater*,	Home.
Rogers, Allen,	*Hampden*,	Prof. Rogers'.
Russell, Myron Roswell,	*Vernon, Vt.*,	32 Oak Hall.
Stevens, Howard Evelith,	*Blue Hill*,	31 Oak Hall.
Stevens, Moses B.,	*Cutler*,	4 Q. T. V. House.
Upton, Edwin Carlton,	*Bath*,	31 Oak Hall.
White, Harvey Aaron,	*Brewer*,	32 Oak Hall.

SPECIAL STUDENTS.

Achorn, Davis Tillson,	*Rockland*,	Mrs. Cowan's.
Archie, John Francis,	*Hallowell*,	28 Oak Hall.
Atwood, Gustavus Gilbert,	*So. Carver, Mass.*,	Mr. Spearing's.
Brown, William Bell,	*Solon*,	Mrs. Cowan's.
Cole, Wallace John,	*Dayton*,	5 Oak Hall.
Dole, Charles Frederick,	*Orrington*,	33 Oak Hall.
Eaton, Oscar Edward,	*East Boston, Mass.*,	33 Oak Hall.
Farrar, Lottie Gertrude,	*Bangor*,	Mrs. Cowan's.
Fislo, Albert,	*St. Albans*,	Head House.
Gilbert, Walter Jesse,	*Dexter*,	6 Q. T. V. House.

Goodridge, Nathan Eaton,	*Orono*,	Mr. Goodridge's.
Gould, Harris Perley,	*North Bridgton*,	Head House.
Gould, Vernon Kimball,	*Milo*,	11 Oak Hall.
Hamilton, Robert Whitman,	*Saco*,	Mr. Elijah Webster's.
Havey, Frank,	*West Sullivan*,	13 Oak Hall.
Hayes, Fred Shaw,	*Oxford*,	Head House.
Haynes, Charles Erving,	*Bangor*,	Home.
Holmes, Frank Lewis,	*Bangor*,	17 Oak Hall.
Libby, Frank Josua,	*Richmond*,	Mr. Kinney's.
Miller, Leslie Butterfield,	*Herman Pond*,	Dairy House.
Morse, Percy Franklin,	*West Hampden*,	12 Oak Hall.
Noyes, Charles Wood,	*Boston, Mass.*,	Prof. Hersey's.
Page, Warren Robin,	*Hampden*,	Mrs. Emery's.
Robinson, Halbert Gardiner,	*Patten*,	Mr. Elijah Webster's.
Robinson, William Chandler,	*Rockland*,	5 Q. T. V. House.
Savage, Seth Herbert,	*Milo*,	11 Oak Hall.
Shaw, John Byron,	*Sanford.*	Dairy House.
Sheridan, Lena Matilda,	*Orono*,	Prof. Aubert's.
Simpson, Erastus Roland,	*Brunswick*,	3 B. Θ. II. House.
Smith, Arthur Nealley,	*Winterport*,	19 Oak Hall.
Sprague, Edward Bela,	*Bowdoinham*,	30 Oak Hall.
Wilder, Harold Merrill, B. A.,	*Brownville*,	33 Oak Hall.

SUMMARY.

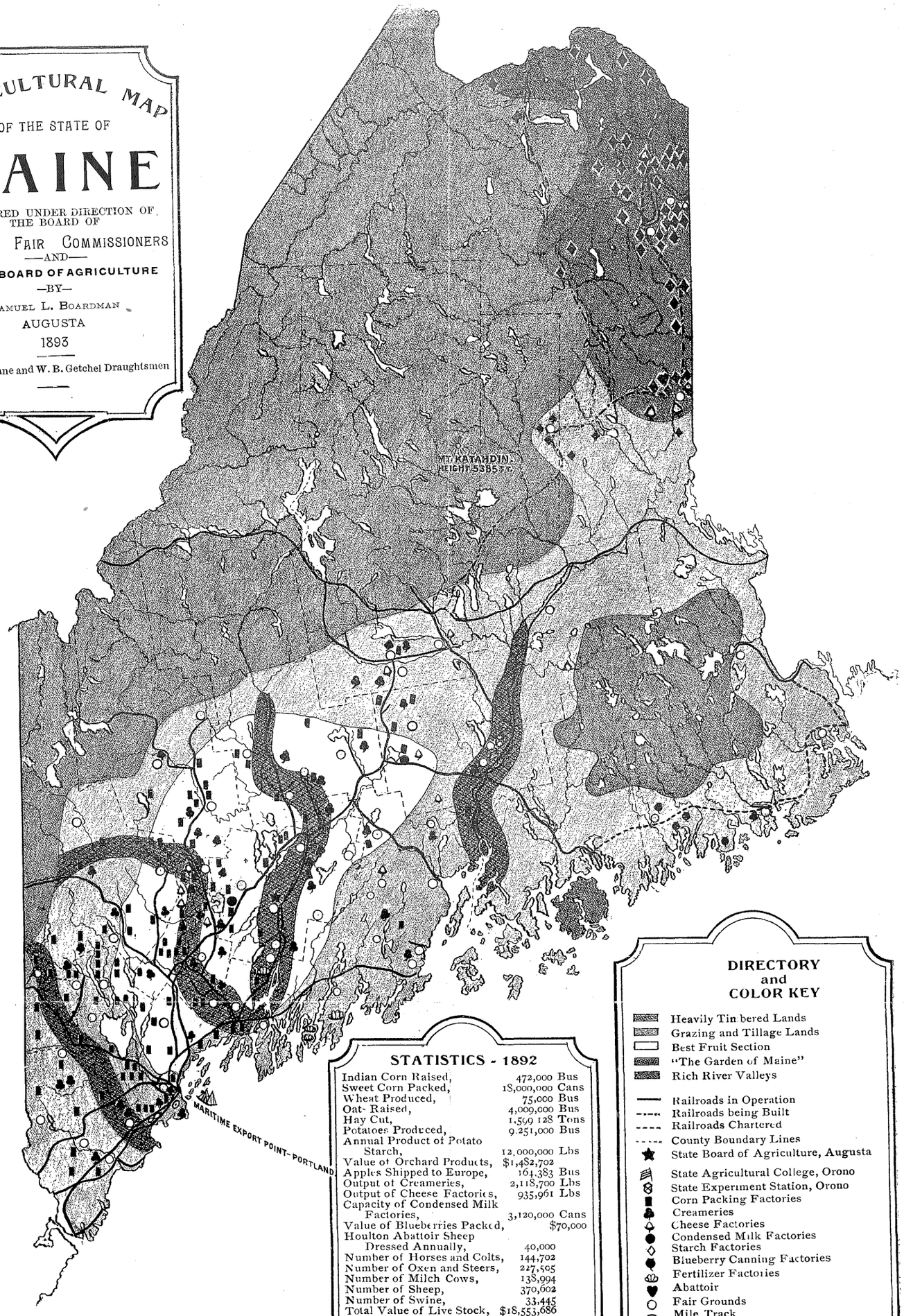
Seniors,	17
Juniors,	19
Sophomores,	33
Freshmen,	38
Special students,	32
Total,	139

FIELD WORK IN SURVEYING.

AGRICULTURAL MAP
OF THE STATE OF
MAINE

PREPARED UNDER DIRECTION OF
THE BOARD OF
WORLD'S FAIR COMMISSIONERS
—AND—
STATE BOARD OF AGRICULTURE
—BY—
SAMUEL L. BOARDMAN
AUGUSTA
1893

J. H. Cochrane and W. B. Getchel Draughtsmen



STATISTICS - 1892

Indian Corn Raised,	472,000 Bus
Sweet Corn Packed,	18,000,000 Cans
Wheat Produced,	75,000 Bus
Oats Raised,	4,009,000 Bus
Hay Cut,	1,569 128 Tons
Potatoes Produced,	9.251,000 Bus
Annual Product of Potato Starch,	12,000,000 Lbs
Value of Orchard Products,	$1,482,702
Apples Shipped to Europe,	164,383 Bus
Output of Creameries,	2,118,700 Lbs
Output of Cheese Factories,	935,961 Lbs
Capacity of Condensed Milk Factories,	3,120,000 Cans
Value of Blueberries Packed,	$70,000
Houlton Abattoir Sheep Dressed Annually,	40,000
Number of Horses and Colts,	144,702
Number of Oxen and Steers,	227,505
Number of Milch Cows,	138,994
Number of Sheep,	370,602
Number of Swine,	33.445
Total Value of Live Stock,	$18,553,686

DIRECTORY and COLOR KEY

- Heavily Timbered Lands
- Grazing and Tillage Lands
- Best Fruit Section
- "The Garden of Maine"
- Rich River Valleys

- Railroads in Operation
- Railroads being Built
- Railroads Chartered
- County Boundary Lines
- State Board of Agriculture, Augusta
- State Agricultural College, Orono
- State Experiment Station, Orono
- Corn Packing Factories
- Creameries
- Cheese Factories
- Condensed Milk Factories
- Starch Factories
- Blueberry Canning Factories
- Fertilizer Factories
- Abattoir
- Fair Grounds
- Mile Track
- Kite Mile Track