Public Documents of Maine:

BEING THE

ANNUAL REPORTS

OF THE VARIOUS

Public Officers and Institutions

FOR THE YEAR

1897.

VOLUME II.

AUGUSTA
KENNEBEC JOURNAL PRINT
1897

ANNUAL REPORT

OF THE

MAINE STATE COLLEGE

FOR THE

YEAR 1896

PART I

PART I—Reports of Trustees, President, Departments, and Treasurer.

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

AUGUSTA
KENNEBEC JOURNAL PRINT
1897

CONTENTS OF PART I.

REPORT OF THE BOARD 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-eighth annual report, with the reports of the president, and treasurer. In the comprehensive report of President Harris, will be found a detailed statement of the resources and needs of the college and reference at length to every department and interest, so that it is unnecessary for the trustees to speak otherwise than in a general way of its affairs.

There have been a number of changes in the faculty during the past year. Prof. W. H. Jordan, who for many years has been one of the ablest and most popular of the faculty, resigned his position in July. His rare ability has been known and appreciated beyond the borders of Maine. He has been called to the head of the experiment station of the great state of New York, at a salary much above what he received here. His departure was greatly regretted. The trustees believe that the college is fortunate in securing as his successor, a man of the reputation and ability of Prof. Charles D. Woods. Ex-President M. C. Fernald has been elected emeritus professor of mathematics, and the college again feels the influence of his ability and earnest zeal. Since our last report was submitted, Prof. Geo. H. Hamlin, for years the faithful treasurer of the college, has resigned that office and Col. I. K. Stetson, a nephew and namesake of the first treasurer, has been elected his successor.

The college was never so well off as to-day, as regards the number and value of its buildings, the condition of its grounds,

the equipment of its different departments, the number and ability of its faculty and in the attendance of students; and yet it has urgent needs, that are mostly the result of the increase in the number of students. The facilities that were ample for one hundred and thirty-nine students three years ago, are entirely inadequate for three hundred and sixteen to-day, which number will doubtless be largely increased by the next freshman class. The most pressing need at the present time, outside of a sufficient appropriation to meet the current expenses, is more room for the students. There are not sufficient recitation rooms for the present number of students, although all the available space for such purposes, including every cellar room but one, is now in use; and there are no waiting, or study rooms, that can be used between recitations by the one hundred or more students who do not live on the college grounds. There is no dormitory for the young lady students. The need of a drill hall, where the students can be drilled in military tactics during the winter season, in compliance with the requirements of the national government, continues as strong as in past years. The need of at least one new building, that shall supply additional recitation and study rooms, is imperative. Such a building would afford relief, or advantage, to every department. The demand for a building for the Mechanical and Electrical Engineering Departments is the most pressing.

The representatives of the college are obliged to urge its financial needs upon the members of the legislature every session. This unpleasant, but necessary duty, would be obviated if a fixed sum for a term of years were appropriated for the maintenance of the college, as is done in the cases of the normal schools and the national guard. The trustees would again renew the recommendation of former years that the State assess annually a tax of one-tenth of one mill for the support of the college. Sufficient means would thus be provided to meet all its expenses, except what may be required from time to time for such new buildings as shall be necessary to keep up with the increase of students and the growth of the college.

There can be no question that the college is growing in favor with the people of the State. The value of the education it gives is more highly appreciated each succeeding year and the students are coming to its halls in increasing numbers, from every county of the State, and it rests with the legislature to decide to what extent they will provide the necessary facilities to enable the college to properly do its work. It has become a strong and successful institution of learning, to which every citizen of the State may point with pride and satisfaction. May it receive the care and support which it deserves.

HENRY LORD,

President of the Board of Trustees.

REPORT OF THE PRESIDENT.

To the Trustees of the Maine State College:

I have the honor to submit my fourth annual report as president of the State College, for the calendar year 1896. I transmit the reports of the heads of the departments, and the catalogue for the college year 1895-6.

GENERAL STATEMENT.

As this report will eventually reach the Governor and Council, the members of the legislature, and the general public, it may be wise to explain briefly the establishment and character of the College, and its relation to the State. These matters are familiar to you but they are often misunderstood by persons who have not an intimate acquaintance with the College.

In 1862 Congress passed a law, known as the Land Grant Act, which gave to the States for each senator and representative in Congress, 30,000 acres of public land, the proceeds of which were to be used for the establishment and maintenance of a college. Maine accepted the gift, by act of its legislature, in 1863, and received 210,000 acres of land, which were sold and yielded an endowment of $118,300, which the State now holds, paying the trustees interest thereon at five per cent. In 1887 Congress passed the Hatch Act granting $15,000 a year to each State, to be used, by the institutions which enjoyed the benefits of the preceding act, in making investigations in the biological sciences and their application to agriculture. This money is for the Agricultural Experiment Station, and no part of it can be used for the payment of the expenses of instruction.

In 1890 the United States provided for the further endowment of the State colleges by the passage of the Morrill Act, under which the college receives a permanent annuity amounting to $22,000, for the current year. The use of this gift is limited to instruction in certain branches.

The results of the generosity of the United States are an endowment of $118,300, yielding $5,915 annually; and two annuities, one of $15,000 and one of $22,000. As the first annuity can be used for the experiment station only, the United States annual contribution to the instruction expenses of the college is now $27,915.

This grant is not a free gift, but is accompanied with certain conditions. The more important conditions, roughly stated, require the State; first, to provide a college; second, to restrict the use of the funds received from the United States to certain purposes; and third, to make the college of a specified kind. The State agreed to these conditions, in the acts of the legislature accepting the United States gifts.

In the first place the State agreed to provide an institution which is not to be a school of inferior grade or narrow scope, but a college,—a high grade institution for liberal culture such as the word "college" meant in 1862, and such as all colleges were at that time.

This college was to be provided by the State, and not by the United States. The College is a State institution, a part of the State public school system, and the State is responsible to see that the College has at least enough money to maintain the work which the State gives it.

This college the State agreed to provide, not accept. The College is a State institution and the State is responsible to see that the College has at least enough money to maintain it.

In the second place, the State agreed to use the United States funds for certain restricted purposes. The income of the original endowment may not be used for the erection of buildings or their repairs; the college annuity may be used for instruction in certain specified lines only. The insufficiency of the income

and the limitations placed upon it, both indicate the need of State aid.

In the third place, the State agreed to maintain a college of a specified kind. In describing the college, the United States law says "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 order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life."

The College is sometimes called the agricultural college; the law makes equal reference to agriculture and engineering. The College is often spoken of as a practical institution; the law declares that it shall be established for "liberal *and* practical" education.

It seems to be the purpose of the law in requiring the teaching of the branches of learning related to agriculture and the mechanic arts, not to exclude all the common subjects of college work, but to make sure that these uncommon features shall be included. They are made the "leading object," but this very expression indicates that they are not the only object. It was not intended that the new college should be like the old college in scope, only with a new kind of work; but it was intended rather that it should have a wider scope, or following the phraseology of the act, it was intended that it should furnish a liberal, and a practical preparation, for the several pursuits and professions of life. The work of the college is to be done in such a manner as the legislature may direct.

It was in accordance with these laws that the Maine State College was established. Its trustees are State officers appointed by the Governor, with the consent of the Executive Council. The trustees are directed by law, to provide for the teaching of the branches of learning relating to agriculture and the mechanic arts, and then as their means will allow, for the teaching of other branches.

There are nine courses of study of four years each, leading to degrees. These are conveniently arranged in three groups:

the General Courses, intended for general training and liberal culture, including the Latin-Scientific and Scientific Courses; the Technical Scientific Courses, including the Chemical, the Agricultural, the Preparatory Medical, and the Pharmacy Courses; the Engineering Courses, including the Civil, Mechanical, and the Electrical Engineering Courses. The Scientific and Latin-Scientific Courses are largely elective, and may be made courses in Mathematics, Physics, Natural History, or Modern Languages, if the electives in these subjects are taken. In addition to these, there are short courses in agriculture and pharmacy, intended for practical training.

The entrance requirements are intended to cover the high school courses which fit for classical colleges or intended to cover equivalent English, modern language, or science courses. The faculty is composed of 34 persons who have obtained their training in 24 colleges or universities. The number of students exceeds three hundred, having more than doubled in three years. Women are admitted. The College is strictly non-sectarian. The income available for the expenses of instruction consists of the grants from the general government already mentioned, of $20,000 from the State, and of miscellaneous receipts. The equipment and buildings, worth about one quarter of a million dollars, have been furnished by the State. There are twenty buildings, large and small, of which about half are used for direct College purposes.

The law establishing the College, made it the duty of the trustees and other officers to make student expenses as low as possible. Tuition and rooms in the dormitory are free, and all other expenses are very low. The average annual expenses of a student are probably less than $250. It is safe to say that there is no other college in New England in which student expenses are so low as at Orono.

THE FACULTY.

The faculty consists of thirty-four persons, but as some of these are officers of the Experiment Station and give all or a part of their time to its work, the College has for teaching, the equivalent of the full work of twenty-three men, one of whom is the professor of military science and tactics who is detailed by the President of the United States without cost to the College. The faculty represent twenty-four institutions, at which they have pursued under-graduate or graduate courses. These are the Maine State College, Bowdoin, Columbia, Dartmouth, Massachusetts Agricultural College, Michigan Agricultural College, Stevens Institute, New York Veterinary College, Massachusetts Institute of Technology, Rochester, Syracuse, Wesleyan, Chicago, Cornell, Johns Hopkins, Harvard, Brown, Michigan University, Iowa State University, University of Paris, University of Leipsic, University of Berlin, and University of Munich.

Professor Whitman Howard Jordan, Sc., D., Director of the Experiment Station and Professor of Agriculture, resigned his position July 1, 1896, to accept the directorship of the State Experiment Station of New York. It was a matter of sincere regret that we were unable to retain him, but the opportunities and salary offered him in New York were so much greater than he enjoyed here that he could not be expected to stay with us without changes which would cause an increase of our expenses beyond our means. He was a graduate of the College in the class of 1875. After spending some time in the Experiment Station at Middletown, Conn., the first in the United States, and then recently established, he returned to the College as instructor. He served as professor of agriculture for some years in the Pennsylvania State College, and again returned to Orono as Director of the Experiment Station. He was later made Professor of Agriculture and Director of the Station. He was one of our strongest and most useful men, interested not only in his own department, but also in the general welfare of the College.

As chairman of the committee on the courses of study Professor Jordan performed a real service for the College, in confirming the large element of general studies which it has always been the policy of the College to maintain in its technical courses. His greatest service was as Director of the Experiment Station. The value of his investigations on the nutrition of animals and human beings can be determined by consulting the reports of the Experiment Station. The estimate placed upon them by those well qualified to judge is shown by his election to the position he now holds.

Professor Charles Dayton Woods, B. S., who succeeds Professor Jordan, comes to us from the Storrs Experiment Station of which he was Assistant Director. He is a graduate of Wesleyan University, and has studied abroad. He was one of the early workers in the first experiment station in the United States. He holds a commission from the United States Government for investigations on human foods. He has had experience in teaching, both in schools and college, and is the author of many scientific papers.

Dr. Merritt Caldwell Fernald has been elected Emeritus Professor of Mathematics. He was connected with the College either as professor or president for twenty-five years, until 1893, when he resigned. His health was seriously impaired, but rest has so far restored it, as to warrant the resumption of work. It is a sincere pleasure to his many friends to see him in the scenes of his former activity. His work is about half that usually assigned to an instructor.

Mr. Harris Perley Gould, B. S., assistant horticulturist in the Experiment Station, resigned his position at the end of the last College year, in order to pursue post-graduate studies, elsewhere. He has been succeeded by Mr. Lucius Jerry Shepard, B. S., a graduate of the Massachusetts Agricultural College.

Mr. Albert Joseph Durgin, of Orono, was employed for some years, for a part of his time, as assistant in wood-work. The increase in the number of students demanded more time than Mr. Durgin could give. He has been succeeded by Mr. Perley Walker, B. M. E., a member of our last graduating class. Mr. Walker gives some instructions in mathematics.

Mr. Fred Charles Moulton, M. S., chemist in the Experiment Station, resigned his position during the summer of 1896, and has been succeeded by Mr. Henry Bennett Slade, B. A., a graduate of Brown University.

Mr. Elmore David Cummings, C. E., was instructor in civil engineering during the college year 1895-6, in place of Assistant Professor Grover, who was away on leave of absence. Mr. Cummings' work was eminently satisfactory and when he left at the expiration of his contract, he carried with him the esteem and good wishes of his associates, and students.

Captain Winfield Scott Edgerly, Professor of Military Science, was recalled by the Secretary of War, in July 1896, and detailed to service upon the staff of the Governor of New Hampshire. He has been succeeded by Mr. Herbert Nathan Royden, 2nd Lieutenant in the 23rd United States Infantry.

Mr. Wendall Wyse Chase, B. C. E., tutor in drawing, resigned his position to pursue post-graduate studies, and has been succeeded by Mr. Harold Sherbourne Boardman, B. C. E., a graduate of the college in 1895.

Mr. Frank Damon, B. S., resigned the tutorship in physics to accept a position as teacher of science in the Bangor High School. Mr. Charles Partridge Weston, B. C. E., a graduate of the college in 1896, has succeeded him.

Mrs. Elizabeth Abbott Balentine has been appointed Secretary of the Faculty in connection with her former duties as secretary to the President.

Miss Alice Pottle has been appointed stenographer and cashier.

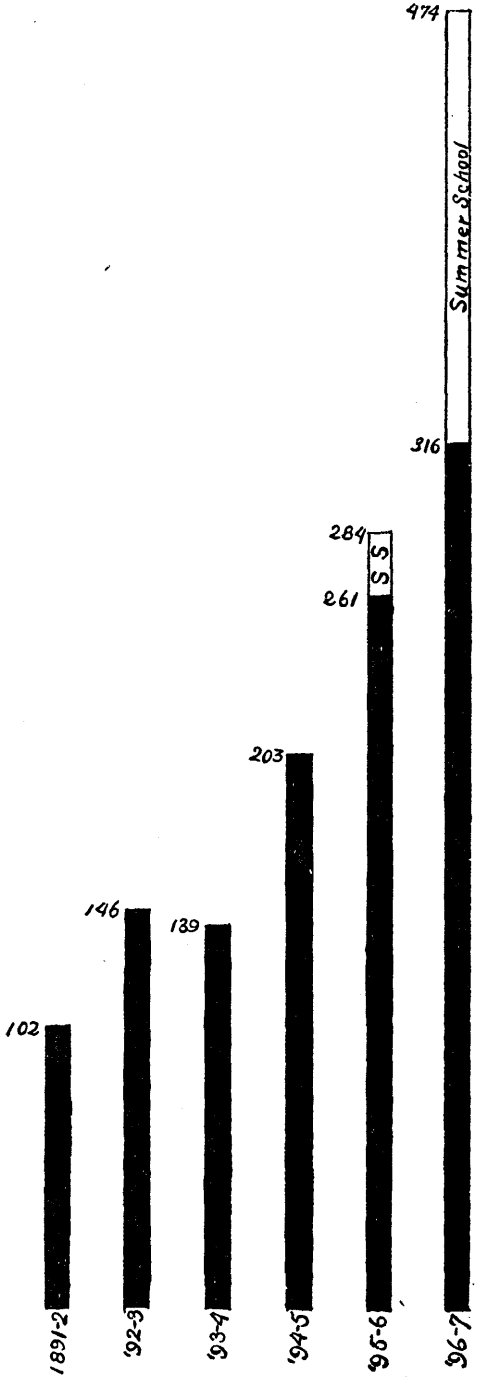
Mr. Guy Ashmore Andrews, B. A., a graduate of Dartmouth College, has been appointed instructor in German and Latin.

Mr. Harvey Waterman Thayer, B. A., a graduate of Bowdoin College in 1895, and of Harvard University in 1896, has been appointed tutor in French and English.

THE STUDENTS.

The number of students for the year will probably be 316. As the report is written before the publication of the catalogue this number may not agree exactly with the more reliable number given in the catalogue which is attached.

Nearly all the new students have entered regular courses, and come to college from the approved schools. For the last six years the number of students has been 102, 146, 139, 203, 261, 316. This shows an increase of 56 per cent. in the last two years and an increase of 127 per cent. in the last three years. These numbers do not include the members of the summer school. If these were included the last two numbers would be 284 and 474. The figure shows this increase graphically.



Increase in the number of students. The length of the lines indicates the number o stud nts.

The students come in about equal numbers from the farms, and from the cities and villages. About 90 per cent. come from Maine. More than ninety per cent. of the students are the sons of poor men. Every county of Maine is represented. In the table below, the students from Orono, Old Town, and Bangor are grouped separately as the location of the College makes the attendance from these places abnormally large. The table is made when statistics for the whole number of students are not available, but it is believed that it will be found to represent the whole body with substantial correctness.

Maine Students by Counties.

COUNTIES.	Actual number.	Quota by population.*	Excess.	Deficiency.
Androscoggin	15	16	.....	1
Aroostook	10	17	.....	7
Cumberland	38	31	7	
Franklin	3	6	.....	3
Hancock	8	13	.....	5
Kennebec	21	19	2	
Knox	6	11	.....	5
Lincoln	8	7	1	.....
Oxford	7	10	.....	3
Penobscot †	46	24	22	
[Orono, Oldtown, Bangor]	[36]			
Piscataquis	6	5	1	
Sagadahoc	4	7	.....	3
Somerset	18	11	7	
Waldo	10	9	1	
Washington	14	15	.....	1
York	8	21	.....	13

* The number which each county would have if the total number were to come from the counties in proportion to their population.

† Omitting Orono, Oldtown, and Bangor.

THE BUILDINGS.

The college buildings are: Oak Hall, the dormitory; Wingate Hall, the engineering building; Fernald Hall, the chemistry building; Coburn Hall, containing the library, chapel, recitation rooms, etc.; the Shop; the Experiment Station Building; the President's house and four other residences; four society houses; the Green-houses; the Dairy building; two barns, and one stable.

Nearly all of these are in excellent condition. One year ago extensive repairs were made to Oak Hall, which were fully described in the last report. Extensive repairs are now in progress in Fernald Hall. The wing containing the chemical laboratory took fire in the winter of 1895. It has been rebuilt in two stories in place of one, allowing two laboratories instead of one. The upper room will be used for qualitative, the lower for quantitative work. Each room is 36 ft. by 40 ft., finished in southern pine, furnished with steam, water, gas, and air blast, and supplied with tables of approved form for 64 students. We are now furnished with excellent facilities for laboratory work in chemistry. The greater part of the expense of this building was covered by insurance, but there will be a deficit of about $3,000 to be made up from the next appropriation. This was expected when the repairs were ordered, but additional accommodations for this department were an immediate necessity. The capacity of the laboratory is doubled at the cost of the deficit above mentioned. A new laboratory has been constructed in the basement of Wingate Hall for the department of physics. A new laboratory for freshman chemistry has been constructed in the basement of Fernald Hall. The college office has been constructed in the basement of Coburn Hall. Two new recitation rooms have been fitted up in Coburn Hall, one in Fernald Hall, and one in the old Q. T. V. building. The light station has been constructed, the shop, the Q. T. V. House, the janitor's house, and the house occupied by Mr. Colby have been painted. Many small repairs have been made.

During the next two years it will be necessary to make extensive changes at the Commons. The foundation walls need to be relaid in part, and the roof needs repairs. In the dormitory the bath rooms should be finished. The main part of Fernald Hall, which was badly discolored by fire, will need painting throughout. In Coburn Hall, the furnishing of the reading room must be completed, and additional shelves built in the library. In the basement a room must be constructed for laboratory work in botany and bacteriology.

THE COURSES OF STUDY.

The courses of study are thirteen. Of these nine occupy four years and lead to degrees. Two occupy two years, and two, one year. These courses are conveniently arranged in four groups:—the General Courses; the Technical Scientific Courses; the Engineering Courses; and the Short Courses.

THE GENERAL COURSES. These are the Latin-Scientific and the Scientific. The LATIN-SCIENTIFIC COURSE is intended for those who wish to become teachers of science or wish a general scientific training. The entrance requirements in Latin are the usual requirements for admission to classical colleges of the highest grade. The required studies include English, French, German, Latin, Mathematics, Chemistry, Physics, English History, American political and constitutional History, Psychology, Logic, and Political Economy. Nearly half the work of the course is elective. Latin is a required study during the freshman year, and elective in the later years.

THE SCIENTIFIC COURSE is practically the Latin-Scientific Course without the Latin. The Scientific Course has been improved during the last three years by the addition of new electives, notably, in mathematics, physics, and modern languages. There are seventeen courses in mathematics, ten in physics, and fourteen in modern languages. The work in modern languages includes courses in French, German, Spanish, Italian, and Old French. Either of these Science Courses may be made courses in Modern Languages, Natural History, Mathematics, or Physics, by the selection of the electives in these subjects.

THE TECHNICAL SCIENTIFIC COURSES are the Chemical, Agricultural, Pharmacy, and the Preparatory Medical Courses. THE CHEMICAL COURSE is one of the most popular. It is intended to fit students for positions as teachers of chemistry, analysts, or managers of large industries in which the knowledge of chemistry is important.

THE AGRICULTURAL COURSE is both technical and broadly educational. It is largely the same as the chemical course, the more technical chemical courses being replaced by courses in Biological Chemistry, Bacteriology, Botany, Feeding of Animals, and strictly technical agricultural studies. The number of students in the course is not large, and most graduates of this course have preferred to become teachers or investigators in agricultural science rather than farmers. This is doubtless due to the financial and economic condition of agriculture as an industry. The course has been widely advertised. No course in the college is better equipped, and few similar courses in the country are fitted to do more thorough work. Shorter courses, largely technical and practical will be mentioned later.

THE PHARMACY COURSE is a special variation of the chemical course. It is one of a very small number of four years courses offered in this country. It has been regarded as impractical to require so long a preparation for pharmacy, but the success of this course is sufficient to indicate that the time is soon to come when this business will fall largely into the hands of liberally educated men. The course is largely chemical and technical, but includes a full quota of studies intended to furnish the general development which will enable its graduates to reap those advantages educated men, in all lines of business, gain through their ability to recognize and utilize opportunities.

The legislature should be asked to make some changes in the law governing the practice of pharmacy in the State. All persons wishing to practice pharmacy, unless they be graduates of a medical school, are required to pass an examination before the State Board of Pharmacy. A serious defect in the law is its discrimination against graduates of courses in pharmacy and in favor of graduates of schools of medicine. These are allowed to

practice pharmacy without examination. The law was probably drawn in the days when the only pharmacists who had pursued courses in professional schools were the graduates of medical schools, and was intended to encourage technical education. At present it is unjust to our graduates. The injustice will be evident when it is remembered, that medical courses seldom exceed three years and are sometimes but two years in length, while the entrance requirements are often lower than those of our long pharmacy course. An illustration will be useful. A student in pharmacy whom we dropped recently for unsatisfactory work, declared it his intention to take a short course in medicine and avoid the Board examination. I do not know what he has done, but it is possible that he may begin the practice of pharmacy without examination a year before the graduation of men who entered college with him. Either the law allowing graduates of medical colleges to practice without examination should be repealed or the State should accept our diplomas as equivalent to an examination by the Board.

THE PREPARATORY MEDICAL COURSE is not a medical course, but a modification of the chemical course, involving the substitution of Botany, Natural History, and Histology for chemical studies, and having as its object to furnish the best preparation for the study of medicine. The graduates of this course are admitted to medical schools without examination, and by arrangement will be granted advanced standing in many schools, including those having the largest number of students and of the highest grade.

THE ENGINEERING COURSES are those in Civil, Mechanical, and Electrical Engineering. The Civil Engineering Course has long been the most popular in the college.

The Mechanical Engineering Course has suffered in numbers by the creation of the Electrical Engineering Course, but it is still one of the largest courses offered.

The Electrical Engineering Course was established only two years ago, but it is already among the large courses, and promises soon to be the largest. The equipment for this

course is still incomplete, but will be increased from the next appropriation.

The demand for electrical engineers is unabated, and the applications of electricity are already so many and increasing so rapidly, that it seems probable that the number of young men studying electricity is likely to increase.

THE SHORT COURSES are:—two in agriculture, (two years, and one year), one in electrical engineering, (two years), one in pharmacy, (two years), one in library economy, (one year), the winter lecture courses in agriculture, (six weeks), and the summer school, (three weeks).

THE SHORT COURSES IN AGRICULTURE are technical courses, intended for students who wish to fit themselves for practical work in agriculture, and cannot take the long course. They are well equipped.

THE SHORT COURSE IN ELECTRICAL ENGINEERING and the long course were established at the same time. As first planned, the short course was made up largely of elective and technical studies in order that it might supply the needs of two classes of persons; first, students who had completed or nearly completed courses in mechanical engineering and wished the technical electrical work needed to fit them for electrical engineering; and second, young men who did not expect to become engineers but wished to devote a short time to technical work to prepare them for work in lighting or power plants. Experience shows that nearly all the students in this course hope to become engineers and ought to take the full course, but prefer this because it is shorter. I am fully persuaded that their expectation is vain, and I fear that the results of this course are likely to disappoint those who follow it. For these considerations and because the number of students in the long course is now as large as can be taken care of with our facilities, I concur with the recommendation of the faculty that no more students be admitted to the short course, that it be no longer advertised in the catalogue, and that when the students now entered shall have finished the course, it be discontinued.

THE SHORT COURSE IN PHARMACY was established for those students who could not afford the time or money required by the long course. It is not to be recommended as a substitute for the long course, but it is equal to the two year courses of the best colleges of pharmacy. The course demands the whole time of the student.

THE COURSE IN LIBRARY ECONOMY, intended to furnish training in the care and management of libraries, was established three years ago, when the library was purchasing few books, and the librarian had the time to care for a small number of students. The duties of the librarian are now greatly increased, and to maintain this course will require the employment of an additional librarian or instructor. In view of the demand for additional help in other departments and of the small number of students who could be served in this course even if an additional instructor were employed, I recommend that the course be discontinued at the end of this college year.

THE WINTER COURSES are intended for farmers. In the winter of 1896 three courses were given, each lasting six weeks, and beginning on the first Tuesday in January. The subjects were General Agriculture, Dairying, and Horticulture. The work was extremely practical and the expenses were low. The class numbered thirteen, smaller than it ought to be, but larger than it had been before.

The courses for the next year have been carefully revised. There will be three courses, one in General Agriculture, one in Dairying, and one in Horticulture. Each will consist of two sessions, to be taken in successive years. The subjects taken up in the first winter are such as would logically precede those of the second winter, but care has been exercised to make the first winter's course, so far as it goes, complete in itself. The topics taken up will include fruit culture, vegetable gardening, greenhouse construction and management, ornamental gardening; economic botany; injurious fungi; entomology; plant and animal nutrition, commercial and farm manures and cropping; veterinary science; milk, butter, and cheese; cows, breeding, judging, and feeding; business law.

THE SUMMER SCHOOL is especially intended for teachers, and students preparing for college. It is under the joint supervision of the State Superintendent of Schools, and the President of the College. The second session began July 13, 1896 and continued for three weeks. The attendance was very satisfactory. In 1895 there were 23 students, in 1896 there were 158. The studies and instructors were: pedagogy and child study, Hon. W. W. Stetson; civics, Prof. A. E. Rogers; high school mathematics, President A. W. Harris; natural history, Prof. F. L. Harvey; chemistry, Mr. D. W. Colby; physics, Mr. Frank Damon; foods, Prof. C. D. Woods; methods of teaching, Dr. C. C. Rounds; nature studies in the common schools, Prof. A. L. Lane; drawing and modelling, Miss Katherine Rounds; physical culture, Miss Carrie Peables.

ENTRANCE REQUIREMENTS.

The entrance requirements are shown in the following table. During the last three years these have been increased. The requirements for the technical scientific, and engineering courses are not fully equal to those for the Latin-Scientific or Scientific courses, but they are as nearly equal as they can be made at present without endangering our connection with the preparatory schools. The difference in requirements is greater than the difference in preparation. Nearly all the students who enter these courses have pursued high school courses equal in length to those pursued by students who enter classical courses.

I recommend that the requirements for the engineering courses be increased in 1898, by the addition of solid geometry, and that the requirements for the technical scientific, and engineering courses be increased in 1899, by the addition of one foreign language.

ENTRANCE REQUIREMENTS FOR ALL COURSES.

THE STARS INDICATE THE STUDIES REQUIRED.

Studies.	General Courses.		Technical Scientific Courses.				Engineering Courses.			Short Courses.		
	Latin Scientific.	Scientific.	Chemical.	Agricultural.	Prep. Medical.	Pharmacy.	Civil Engin.	Mech. Engin.	Elect. Engin.	Pharmacy, 2 yrs.	Agricult., 2 yrs.	Agricult., 1 yr.
Elementary: a												
Geography	.....	.....	.....	.....	.....	.....	.....	.....	.....	*	.....	.....
Arithmetic	*	*	*	*	*	*	*	*	*	*	*	*
English Grammar	*	*	*	*	*	*	*	*	*	*	*	*
Physiology	*	*	*	*	*	*	*	*	*	*	*	*
Language: b												
English	*	*	*	*	*	*	*	*	*	.....	*	*
French	*c	*c	....	....	....	....	....	....	....	....	....	....
German												
Latin	*	...	....	....	....	....	....	....	....	....	....	....
History:												
United States	*	*	*	*	*	*	*	*	*	*	*	*
General		*d										
Roman	*		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
English	.....											
Mathematics: e												
Plane Geometry	*	*	*	*	*	*	*	*	*	....	...	....
Algebra	*	*	*	*	*	*	*	*	*	*f	*f	*f
Science: a												
Botany	....	*g	*g	*g	*g	*g	*g	*g	*g	....	*g	*g
Chemistry		*	*	*	*	*	*	*	*		*	*
Phys. Geog.												
Physics												

a—One year of Latin, or of a modern language will be accepted as a substitute for all the elementary studies, or for one science.

b—In 1899, one foreign language, either ancient or modern as the candidate may prefer, will be required for the technical scientific, and the engineering courses.

c—Either French or German; one year of Latin will be accepted as a substitute.

d—General, or Roman, or English History in addition to United States History.

e—In 1898 solid geometry will be required for engineering courses.

f—Through simple equations of the first degree only.

g—Two sciences, from the list of four, are required.

THE COMMENCEMENT.

The exercises of the last Commencement were the Junior Exhibition, Saturday June 13; the Baccalaureate Address, June 14, delivered by the President; the Convocation, in the morning of June 15; the Class Day Exercises in the afternoon; the Receptions by the College Fraternities at their club houses in Exhibition Drill in the morning of Tuesday, June 16; the

the afternoon; the Reception by the President in the evening; Commencement in the morning of Wednesday, June 17, followed by the Commencement Dinner; the meeting of the Alumni Association in the afternoon, and the Commencement Concert in the evening.

Certificates were presented to the following persons upon completing the course in Library Economy, in a satisfactory manner:

Carrie Smythe Green, Bangor.
Rena Pearl Vinall, Orono.

The first degree was conferred on the following persons:

Harry Clifford Farrell, B. M. E., Machias.
Roy Lynde Fernald, B. C. E., Winterport.
Edward Everett Gibbs, B. C. E., Bridgton.
Everett Gray Glidden, B. M. E., Augusta.
Frederic Andrew Hobbs, B. S. (in Science), Alfred.
George Wesley Jeffrey, B. C. E., North Monmouth.
Ralph Barton Manter, B. C. E., Milo.
Herman Stephen Martin, B. C. E., Foxcroft.
Herbert Lester Niles, B. C. E., Levant.
Warren Robbins Page, B. C. E., Newburg Village.
Perley Burnham Palmer, B. C. E., South Bridgton.
Frank Perley Pride, B. S. (in Chemistry), Westbrook.
Lore Alford Rogers, B. S. (in Agriculture), Patten.
Paul Dudley Sargent, B. C. E., Machias.
Erastus Roland Simpson, B. M. E., Brunswick.
John Alvah Starr, B. C. E., Orland.
Stanley John Steward, B. M. E., Foxcroft.
Gilbert Tolman, B. M. E. (in Electricity), Milo.
Perley Walker, B. M. E., North Anson.
Charles Partridge Weston, B. C. E., Madison.
Frank Elwin Weymouth, B. C. E., Medford Center.
Beecher Davis Whitcomb, B. M. E. (in Electricity), Easton.
Gardiner Benson Wilkins, B. M. E. (in Electricity), Brownville.

The second degree was conferred upon 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:

Wilbur Allerd Bumps, M. S., Dexter, Me.

Walter Wilson Crosby, C. E., Gardiner, Me.

Honorary degrees were conferred upon the following persons:

Whitman Howard Jordan, Sc. D., Orono.

Mary Sophia Snow, M. Ph., Bangor.

Howard Scott Webb, M. E., Orono.

PRIZES.

New prizes have been established as follows:—

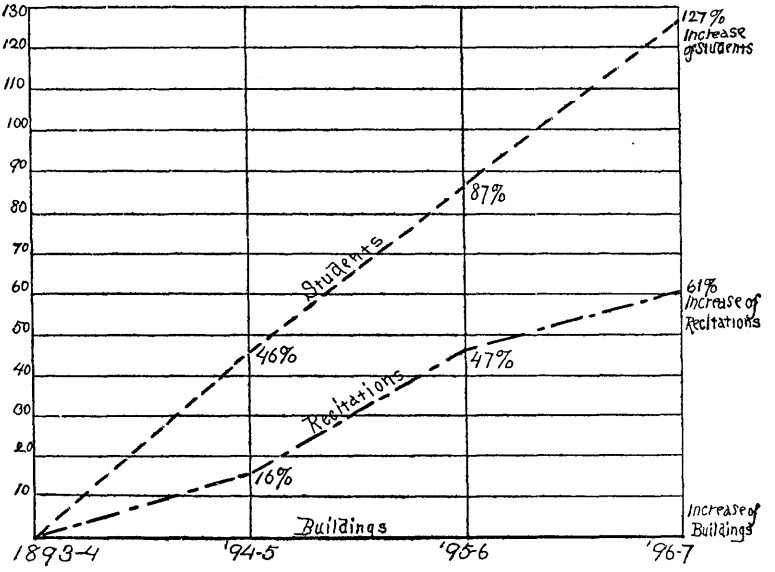
The Walter Balentine Prize, the gift of Dr. Whitman H. Jordan, of the Class of 1875, to be awarded to that member of the junior class attaining the highest rank in biological chemistry.

The Decker Prize, the gift of Wilbur F. Decker, C. E., of the Class of 1879, to be awarded to that member of the sophomore class who shows the greatest improvement during the year.

SPECIAL NEEDS OF THE COLLEGE.

RECITATION ROOMS. One of the most pressing needs is recitation rooms. Each instructor should have his own room, and no room should be used for large classes during successive hours. It is quite impossible for us to observe these rules. Instructors are sent from room to room, and sometimes from building to building. Large classes must be crowded into small rooms, and nearly all rooms are used continuously. In making up the table of recitations for the fall term, the Secretary of the Faculty had great difficulty in finding any place whatever, for some recitations. During the fall term one instructor used nine different rooms. In the last two years, we have fitted up several new rooms usually taken from other uses. Nine cellar rooms are in use as recitation rooms, laboratories, or offices, and we shall be obliged to arrange still another

room in the basement of Coburn Hall. This will exhaust all spare room in the cellars. The difficulty is caused by the increase in the number of students. Large classes must recite in divisions. The present freshman class is divided into four divisions, and the sophomore class into three. This makes seven recitations in each of several studies where there were only two, three years ago. The number of hours of instruction given daily in the fall term of 1893 was 45, in 1896 it was 83. The pressure will be still greater after the graduation of the present senior and junior classes which are comparatively small. The only relief will be found in the erection of new buildings.



The increase of students, recitations, and buildings by percentages.

PUBLIC STUDY ROOMS. Recitations are not continuous throughout the day. Each student has at least one of the morning hours, and some time during the afternoon, when he is not employed in the recitation room or the laboratory. There is no hour in which some students are not free. The students who live in the dormitory or society houses—about two-thirds of the whole number—return to their rooms and

spend this time in study, but the others who live in the village, a mile and a quarter from the College, cannot return to their rooms, and should have large public study rooms provided for them, one for the men, and one for the women. There are no rooms in our buildings which can be taken for this purpose.

THE SHOP. Our shop building cost originally, $2,800 and contains about $20,000 worth of apparatus. Here are the foundry, forges, iron working machinery, carpenter shop, boilers, engines, and dynamos upon which the mechanical and electrical engineering departments are dependent. A fire might destroy the usefulness of all this apparatus and ruin our lighting plant, in the adjoining light station.

The shop is too small. There are forty-five students using the nineteen forges in the forge room, thirty using the ten places in the iron working room, forty-three using the nineteen places in the carpenter shops. There are no separate facilities for the shop work of the electrical engineering department. This year we are working the students in shifts, but this plan will not make the equipment equal to the demand of the next few years.

Next year there will probably be 122 students in the courses which use the shops, against 61 students three years ago. During this time there has been no enlargement of the shop, or equipment. I recommend that the Legislature be asked to make an appropriation for the erection of a building for the mechanical and electrical engineering departments. It should contain offices, recitation rooms, and drawing rooms, foundry, forge room, iron working room, carpenter shop, dynamo room, and engine room. Connected with it should be a house containing storage room for coal, and boilers capable of supplying power and heat to all our buildings. Our buildings are now heated, each by its own apparatus, but this system is wasteful, and a central heating plant must eventually be substituted for it.

The erection of this building would increase the recitation rooms for the other departments by vacating the rooms of the mechanical engineering department in Wingate Hall.

CHAPEL AND LIBRARY. The daily chapel assembly is held in a room on the top floor of Coburn Hall, which will seat 300 people comfortably, and 350 with crowding. The officers of the college and the students, together number 350. If the entering class of next year is as large as that of this year, the aggregate number will be about 400. The location of the room at the top of a building makes it very unfit for crowded use, especially so, since it is reached by a single stairway, and the entrance is cramped.

When Coburn Hall was erected, a room was provided for the library on the first floor of the wing. This served as shelf room, office, and reading room, until last year when it was found too small, and the room formerly used for a physical laboratory, occupying the whole of the south side of the main building, was taken for a reading room, and office. The reading room is already too small, and both rooms occupied by the library are sorely needed for recitation rooms. I therefore recommend that when the chapel building is erected, rooms for the library be combined with it. Such a combination is convenient and common.

DORMITORIES. At the beginning of the present year, about one hundred students who could not be provided with rooms in our dormitory, were obliged to seek rooms in the villages of Orono and Stillwater. For some reasons this arrangement is unsatisfactory, but in view of the many pressing needs of the college, I do not feel justified in recommending a present appropriation for dormitories. The Legislature may, however, provide for the best solution of this difficulty without any immediate expenditure, by encouraging the erection of student club houses. About one-third of our students live in club houses which are maintained and controlled by the societies. The members of each society usually take their meals in their house, employing a matron or steward, who has charge of the house keeping. The houses provide the best homes for students. I recommend that the Legislature be asked to pass a resolve directing that whenever any student society, desiring to erect upon the campus, or other approved site, a society

building, shall give the trustees proof that it can provide for all but $5,000 of the cost, the trustees shall certify this fact to the State Treasurer, who shall pay to the treasurer of the college the sum of $5,000 to be expended by the trustees in assisting in the erection or purchase of such a building, provided that the building with furniture shall cost not less than $8,000, and shall contain rooms for not less than twenty students, that the plans shall be satisfactory to the trustees, and that the building shall be the property of the College, to be held for the sole use of the society as long as it shall exist.

By adopting this method the State will save a large part of the expense of erecting the dormitories, and all expense of maintenance and care. At the same time the students will reap evident advantages. Such an offer would not be taken up during the next two years, but it should be made now, to encourage the societies to begin the collection of money.

A DORMITORY FOR WOMEN. When the college was founded, or soon after, the Legislature ordered that all its facilities should be open to women, but no provision was made for a woman's dormitory, although the first building erected was a dormitory for men. Since the building of the electric road, the number of women has increased. It is unwise and unjust that the class of our students who most need oversight, should be left without it.

DRILL HALL. Two years ago I called attention to the need of a drill hall and gymnasium. What was said then is true now. The United States law requires instruction in military science. In this climate, military drill can be carried on without a drill hall, only a few weeks at the beginning and end of each year. Such a building would serve also as a gymnasium. About half of our students come directly from the farms of the State where they have been accustomed to severe and protracted bodily exercise, and they need systematic physical culture to enable them to accommodate themselves to the comparatively quiet life of a student. The State College is the only college in the State, without a gymnasium.

COLLEGE FINANCES.

The college income comes from (1) endowments, (2) the United States Government, (3) the State government, (4) students, and (5) miscellaneous sources.

The receipts from endowments, including rent, and the income from the gift of Governor Coburn, are $10,672.50.

The receipts from the United States are $22,000.

The receipts from the State are $20,000.

The receipts from the students have never been counted as a part of the college income, as they are not available to pay for instruction, or general college expenses. The largest item in student charges is for the board of those who room in Oak Hall and have their meals at the Commons. Other student payments are the term charge, which cover the lighting, heating, cleaning of public rooms, etc., and the laboratory charge for materials used and apparatus destroyed.

The receipts from miscellaneous sources are trifling.

The amount of money available for the payment of college expenses proper, including salaries, care of property, purchase of supplies, repairs, etc., is

1.	Endowments,	$10,672.50	
2.	United States Annuity,	22,000.00	
3.	State Appropriation,	20,000.00	$52,672.50

The United States annuity may not be used for buildings or repairs. The United States annuity and the income from endowments are used for the payment of salaries. The State fund pays incidental expenses, such as repairs to buildings, increase of apparatus, insurance, advertising, postage, trustee expenses, treasury expenses, commencement expenses, water, care of grounds, and a multitude of other things. The last legislature prohibited the use of the State money for the payment of instruction salaries. I ask that this prohibition be removed, or at least that we be allowed to use $5,000 or as much thereof as may be necessary for salaries. The total expenditure for salaries when divided by the number of students

is 27 per cent. less than it was three years ago; or, in other words, the cost of teaching each student is 27 per cent. less.

For general repairs we shall need about the same sum as has been spent in the last two years. We shall be obliged to take from this appropriation a considerable amount to pay for special repairs which were made in the last two years but could not be covered by the last appropriation. The other uses of the State fund will be practically as before.

We shall need $30,000 a year in place of the $20,000 which we have been receiving. I trust that this request will be granted without opposition. Two years ago both houses of the legislature passed an act appropriating $25,000 a year. To save expense to the treasury this was reduced to $20,000. Every economy has been used but the incomes has been insufficient by about $10,000. I do not refer to a debt but to the things left undone which ought to have been done, and which must now be done. The request involves only an increase of $5,000 a year over the sum both houses considered necessary two years ago. In the mean time the number of students has increased nearly sixty per cent. This increase of students of course increases total expenses.

The injustice to the College and to those who manage it, resulting from the lack of provision for current expenses covering more than two years, should be urged upon the legislature. If the amount of the appropriation for our current expenses were fixed by a general statute, the College would go before each legislature, prepared for a change, if the majority wished to make it, but with the endorsement of the previous legislatures, which had already studied the College needs. The presumption would be in favor of continuing the old appropriation. Now, it is the position of many members that if other State enterprises need more money than usual, we must get along with less,—that our appropriation is not a necessary one, but a state generosity. As a fact our claim is the same as that of any other State institution. There is ample precedent for a permanent appropriation. When the United States Government passed the acts relating to the college it did not

propose annual appropriations, but gave, in one case, an endowment, and in the others, annuities. Many States, and a rapidly increasing number, provide for their State colleges by taxes at a fixed rate. Maine gives a fixed amount to the normal schools, to the public schools, and to the great military school of the State, the National Guard. To this general rule, the State College is an exception. Why? Surely the State College can no longer be regarded as an experiment. I therefore recommend that the College ask this legislature, as it asked the last, for a tax of one-tenth of a mill for current expenses. If the legislature is unwilling to adopt this method I trust it will at least adopt the plan suggested two years ago by the speaker of the house, the present governor of the State, providing for an appropriation for a term of years.

A. W. HARRIS,
President.

REPORT OF THE TREASURER.

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 college July 1, 1896.

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.		
THE COBURN LOAN FUND	–	100 00
College Treasury	$41 50	
Loaned	58 50	
THE FRANK KIDDER SCHOLARSHIP FUND	–	675 00
Bangor Savings Bank	675 00	
THE KITTREDGE LOAN FUND	–	826 20
Bangor Savings Bank	170 28	
Loaned	755 92	

The Income of the college from all sources for the year beginning July 1, 1896, will be as follows:

United States Morrill Act	$22,000 00
Land Grant Fund	5,915 00
Coburn Bequest	4,000 00
The State*	10,000 00
Rents	757 50

* This is for the half year. The State appropriation expires December 31, 1896, when the fiscal year is half completed.

Net Expense of the College from June 30, 1895 to June 30, 1896.

CURRENT EXPENSES:		
Salaries		$24,977 19
Departments:		
Agriculture, Agricultural Chemistry	$ 39 55	
Field Day	251 69	
Bacteriology and Veterinary Science	66 30	
Farm	1,597 39	
Horticulture	299 71	
Physics	49 85	
Chemistry, Laboratory	277 98	
Photography	69 51	
Pharmacy	65 39	
Natural History	215 05	
Civil Engineering	275 40	
Drawing	3 37	
Electrical Engineering	5,274 45	
Mathematics and Astronomy	23 95	
Mechanical Engineering	2,744 22	
Military Science	161 15	
Library	1,113 42	
		12,667 03
General Expenses:		
Advertising	$ 224 30	
Grounds	1,316 12	
Office	637 61	
Commencement	357 32	
Miscellaneous	606 50	
Postage and Stationery	287 62	
Furniture and Fixtures	356 98	
Interest and Discount	246 78	
Insurance (for 5 years)	3,097 46	
Trustees Expenses	260 22	
Water	208 49	
Diplomas	105 10	
Summer School	49 24	
Lighting Oak Hall	427 56	
		8,181 30
General Repairs		4,511 79
Cost of Maintaining the College for the Year		**$50,337 31**
CONSTRUCTION EXPENSES:		
Light Station	$ 1,291 98	
Oak Hall	12,073 70	
Fernald Hall	455 98	
		13,821 66
INVESTMENT OF ENDOWMENT FUNDS		6,446 74
NOTES PAID BY TREASURER (outstanding at beginning of year)		3,581 75
		$74,187 46
BALANCE OF CASH ON HAND JUNE 30, 1896		294 37
		$74,481 83

Receipts of the College from June 30, 1895 to June 30, 1896.

Income for Current Expenses:		
Balance of cash June 30, 1895	$ 460 05	
Land Grant Fund	5,915 00	
Coburn Fund	2,000 00	
Morrill Fund	21,000 00	
The State	20,000 00	
Rents	578 33	
Notes paid	156 75	
Prizes	55 00	
		$50,165 13
Insurance on Fernald Hall		6,704 06
Net receipts from students		450 65
Endowment Bonds sold:		
Knox & Lincoln Railroad 5% Bond for $1,000	$1,045 83	
Portland & Rumford Falls Railroad 5% Bond for $1,000	1,020 83	
Trenton Passenger Railway 6% Bond for $1,000	1,045 33	
Security Loan & Trust Company's Bonds for $3,000	2,850 00	
Interest on bonds	200 00	
		6,161 99
		$63,481 83
Borrowed on treasurer's notes still outstandiug		11,000 00
		$74,481 83

Account with the Experiment Station for the Year Ending June 30, 1896.

RECEIPTS.		
Balance on hand June 30, 1895	$ 605 67	
Hatch Fund	15,000 00	
Fertilizer Control	2,148 74	
Station General Account, including U. S. Food Investigation and Creamery Inspection	896 42	
		$18,650 83
EXPENDITURES.		
Salaries	$9,340 48	
Labor	714 37	
Publications	399 20	
Postage and Stationery	139 91	
Freight and Express	204 61	
Heat, Light and Water	381 98	
Chemical Supplies	225 74	
Seeds, Plants, etc	301 23	
Feeding Stuffs	340 67	
Fertilizers	32 70	
Library	156 09	
Tools, Implements and Machinery	35 17	
Furniture and Fixtures	281 32	
Scientific Apparatus	866 40	
Live Stock	650 00	
Travelling Expenses	178 34	
Contingent Expenses	233 23	
Buildings and Repairs	789 46	
General Account, including U. S. Food Investigation and Creamery Inspection	1,220 72	
Fertilizer Control	2,164 90	
		18,375 62
Balance of cash on hand June 30, 1896		275 21
		$18,650 83

Account with the United States Government Appropriation, under the Morrill Act, for the Year ending June 30, 1895.

RECEIPTS.		
Received from United States, July 31, 1895	-	$21,000 00
EXPENDITURES.		
Department of Agriculture	$4,450 00	
Mechanic Arts	7,050 00	
English Language	1,800 00	
Mathematical Science	2,300 00	
Natural or Physical Science	3,600 00	
Economic Science	1,800 00	
		$21,000 00

Respectfully submitted,

ISAIAH K. STETSON, *Treasurer.*

I hereby certify that I have examined the accounts of the Treasurer, and find them correctly kept, and properly vouched.

ELLIOTT WOOD, *Auditor.*

REPORT OF THE DEPARTMENT OF ENGLISH.

President A. W. Harris:

SIR:—Since I made my last report the work in English has been somewhat extended and improved, the better preparation of our students making it possible to do more advanced work than hitherto.

The study of rhetoric now extends throughout the freshman year. In the fall term the elementary principles of the art are taught with Genung's Outlines as the text-book. Several of Shakespeare's plays are read partly as literature, partly as illustrations of rhetorical principles. Many short essays are written some *ex tempore*, some from topics previously assigned. In the spring term Hill's Principles is the text-book. Special attention is given to the construction of the paragraph, outlines, briefs, the study of argumentation, persuasion, etc. Baker's Specimens of Argumentation, Lamont's Specimens of Persuasion, and some of Macaulay's Essays are used in connection with the text-book. Twenty-five essays are written during this term.

The work in English literature has, on the whole, been as successful as could be expected under the circumstances; but it will always be unsatisfactory until the library is more fully supplied with standard works. Some improvement has lately been made; but there are still many gaps to be filled. Until we have books enough to illustrate fully the development of English literature, satisfactory courses of reading cannot be arranged. Not less than two hundred and fifty dollars a year will be needed to furnish the materials for doing work satisfactory to the student and creditable to the college.

H. M. ESTABROOKE,
Professor of English.

REPORT OF THE DEPARTMENT OF MODERN LANGUAGES.

President A. W. Harris:

SIR:—The courses in French and German, which extend respectively over a period of two college years, are planned with the object of enabling the student who pursues them with earnestness of purpose to acquire such a vocabulary and such a familiarity with the spirit of the language that he can read it with ease. As aids to this end there is in the courses a large amount of prepared reading, sight reading, considerable translation of English into the foreign idiom, and thorough training in its grammar. Owing to the fact that the classes are large, little or no attempt is made to teach a speaking knowledge of the language. Had the instructors time, an elective conversational course could be very advantageously given.

The works read in the modern language are always those of prominent authors. An attempt is made to give the student at least some conception of the literature of the tongue studied; in German, for example, the authors read are mainly those belonging to the eighteenth century, the classical period, while in French especial attention is paid to the writers of the present century. Italian and Spanish each are given for one year. It is expected that one having pursued these courses will possess the ability to read either language with only occasional difficulties. Standard authors are read in these courses as in the others. The course in Old French is given especially for those intending to teach. The course is to be recommended not only to modern language students, but also to Latin students, or to those making a specialty of English language. Extracts from the chief Old French writers are read. Considerable attention is paid to phonology, inflections, and etymology.

At present the work is conducted by three instructors. Mr. Andrews* gives five hours a week of his time to beginners' German, Mr. Thayer ten hours to two divisions of the beginners' French, and Mr. Nichols devotes eighteen and half hours a week to the courses. There are four divisions of the elementary French class, numbering over a hundred, and two divisions of the advanced French class. The other courses are not divided. The number of students in the classes, or divisions, is about thirty. The corps of instructors, greatly increased this year, has rendered it possible to do better work than before.

Although the amount of work done now in the Modern Languages is fully equal to that of the ordinary college, there is every indication that more advanced courses would be very acceptable to an increasing number of our students; and in fact the calls for such courses have not been few during the year. It is the object of the department to be able some day to offer as thorough training as can be expected from a college. To this end a great increase in the modern language library is imperative.

Most respectfully,

EDWIN B. NICHOLS,
Instructor in Modern Languages.

October 29, 1896.

*Mr. Andrews resigned at the end of the fall term, 1896, and was succeeded by Mr. W. S. Elden.

REPORT OF THE DEPARTMENT OF LOGIC AND CIVICS.

President A. W. Harris:

SIR:—During the past year I have given instruction in Political Economy, Constitutional Law and History, English History, General History, Logic, Psychology, History of Philosophy, History of Civilization, and the Italian language. In all these branches, I am glad to say, the classes have made excellent progress, the work of the seniors in civics being especially commendable. The needs of this department are but few; two hundred dollars for maps and charts would be sufficient for the coming two years.

Very respectfully,

A. E. ROGERS,
Professor of Logic and Civics.

DEPARTMENT OF MATHEMATICS AND ASTRONOMY.

President A. W. Harris:

SIR:—During the past two years, some important changes have been made in the mathematical instruction. The time devoted to solid geometry by the freshman class has been reduced and more time given to algebra; analytic geometry has been changed from the second to the first term of the sophomore year; calculus is begun in the second term of the sophomore year, thus giving the engineering students an earlier preparation for the study of mechanics. The following elective corses have been added: advanced algebra, elective in the sophomore year, second term; modern analytic geometry, advanced integral calculus, theory of equations and differential equations, electives in the junior and senior years. These electives make it practicable for a student to take work in pure mathematics throughout his four years course. The number of students taking them has exceeded my expectations and has demonstrated the need of such electives.

Descriptive astronomy which was formerly required of all students, and practical astronomy which was taken by all engineers, are now required of students in civil engineering only, and are elective for students in the scientific courses. A further elective in practical astronomy, extending throughout the senior year is offered, but will not, probably, attract many students till the college possesses an observatory.

The great increase in the number of students has rendered it necessary to divide the classes in mathematical work so that the freshmen now recite in four sections, the sophomores in four, and the junior engineers in two. The divisions have been made when practicable along lines of scholarship, rendering it possible to adapt the instruction much more closely to the needs

of individual students. The teaching of this increased number of classes has been well provided for by the appointment, in 1895, of Mr. H. G. Robinson as Tutor in Mathematics, and at the beginning of the present college year of Dr. M. C. Fernald as Professor Emeritus, and of Mr. Perley Walker, Tutor in Shop-work and Mathematics.

Some valuable volumes have been added to our department of the library and a small collection of mathematical models has been purchased. Many more books are needed, particularly standard works on calculus and theoretical astronomy.

The recitation room, occupied by the tutor in mathematics is not comfortable during the winter season. It would be of decided advantage if the department could occupy two or three recitation rooms in one building. The old settees in the rooms now occupied by Professor Fernald and Mr. Robinson should be replaced by chairs with writing arms.

Additions should be made to our astronomical instruments. An artificial horizon, costing about $30, is needed for sextant work. To adapt the instruction in practical astronomy to modern methods, we should have a combined transit instrument and zenith telescope, costing $1,000 or $1,200, and a small building as a shelter or observing station, costing, perhaps, $300. In the near future the college should have an astronomical observatory fitted up with an equatorial of from six to ten inches objective, a spectroscope, chronograph and other instruments. Such an outfit would meet all the needs of instruction in astronomy. Astronomical research may well be left to larger and wealthier institutions, but our state college should certainly be able to furnish instruction in practical observatory work.

Respectfully submitted,

J. N. HART,

Professor of Mathematics and Astronomy.

REPORT OF THE DEPARTMENTS OF PHYSICS AND ELECTRICAL ENGINEERING.

President A. W. Harris:

SIR:—Below is submitted my sixth annual report for the department of Physics and second for the department of Electrical Engineering.

A. PHYSICS.

1. NEW COURSES. It had been my aim for some time to establish a sufficient number of advanced courses in physics to enable a student to put the greater part of his special work on this subject; in fact to arrange a course which would be similar to that offered in chemistry so far as the facilities of the department would admit. After the years' leave for study granted me by the trustees, during which time I made myself familiar with undergraduate courses offered in various colleges and universities, it was thought best to offer the following new courses:

(*a*) *Mathematical Physics.* This course will vary from year to year, and will in general illustrate the application of higher mathematics to physics.

(*b*) *Advanced Optics.* A course more advanced than the general sophomore work, based on Preston's Light.

(*c*) *Advanced Laboratory Work.* This runs an entire year and gives the student a thorough training in laboratory methods. It is work of a higher grade than that of the sophomore year.

In addition to these advanced courses the following elementary courses have been added to meet the wants of short course students:

(*d*) *Elementary Physics.* Designed for students in the two year courses who have not the mathematics required for the general course.

(*e*) *Special Laboratory Course.* Designed for the same class of students as *d*.

2. NUMBER OF STUDENTS. The growth of the College and the addition of new courses have largely increased the work of this department. I estimate the number of students in physics this year will be as follows:

Course.	Fall.	Spring.	Hours per week.
Elementary Physics	18	15	2.5
General Physics	85	80	5.0
Mathematical Physics	1	—	2.5
Advanced Laboratory	2	1	5.0
Advanced Optics	—	2	2.5
General Laboratory	—	70	5.0
Special Laboratory	—	15	5.0

3. FOUR YEAR COURSE IN PHYSICS. I announce, with considerable satisfaction, that the course in science has been so arranged that a student may put the major part of his time on the subject of physics, and obtain his degree with special reference to that subject. Two students are at present registered for that course.

4. TIME GIVEN TO CLASS WORK. Including the work done in the department of Electrical Engineering the time given to class and laboratory work is as follows:

	Fall Term.	Spring Term.
Professor	16.5 hours.	31.25 hours.
Tutor	15.5 hours.	25.00 hours.

The excess of work in the spring term has been provided for by the appointment of an assistant for that term. This will rearrange the time as follows:

Professor.... 18.75 Tutor..... 18.75 Assistant... 18.75

5. GENERAL EQUIPMENT AND FACILITIES. Attention is called to the fact that while the department of chemistry has one of the finest laboratories in New England, the kindred department of physics, with nearly as many students, has one room about 20 by 30 feet for a laboratory. During the last six years the number of courses in physics has increased from one to ten, and the number of students from about 25 to about 170. Some additions have been made within that time to the material equipment, but the department is lacking in apparatus

to accommodate the large classes and to carry on the advanced courses.

6. IMMEDIATE AND PRESSING NEEDS.

(*a*) *More Room.* It is hoped that if new quarters are provided for the departments of mechanical and electrical engineering, this department will be able to extend its quarters in Wingate Hall, and thus secure the additional room that is an immediate necessity.

(*b*) *Additional Apparatus.* The necessity for this is shown in the last heading and enlarged upon below.

7. SUMMARY OF NEEDS.

(*a*)	Duplicate apparatus of general laboratory work.	$300.00
(*b*)	Apparatus for class room lectures.....	500.00
(*c*)	Cases, tables and furniture.....	150.00
(*d*)	Apparatus for advanced courses.....	400.00
(*e*)	Arrangement for darkening lecture room.....	25.00
(*f*)	Lantern slides.....	50.00
		$1,425.00

B. ELECTRICAL ENGINEERING.

1. NEW COURSES. In my last report I sketched the growth of the department of electrical engineering since the organization of the department. It may be proper to add that the last two years have witnessed still greater growth. To meet this new courses have been added as follows:

(*a*) *Electrical Shop-work.* A course giving the student instruction in methods of preparing and testing apparatus. Nearly all the more common electrical instruments will be constructed by the students.

(*b*) *Theoretical Electricity.* The mathematical theory of certain electrical instruments, such as the tangent galvanometer, will be discussed with the students.

(*c*) *Electric Power Stations.* Lecture on their construction, equipment, and arrangement.

2. STUDENTS. The number of students in this course is as follows: Freshmen, 46; Sophomores, 22; Juniors, 14; Senior, 1.

3. TIME FOR INSTRUCTION. The time given to instruction in this course is as follows:

	Fall.	Spring.
Professor of Physics.....	8.0 hours	1.25 hours
Instructor in Electrical Engineering	26.0 hours	21.25 hours
Tutor in Physics.....	8.0 hours	0.00 hours

4. NEEDS. The most pressing need is *room.* This topic is discussed in connection with the report of the Professor of Mechanical Engineering. Assuming that a new building is to be forthcoming, the following is an estimate of the requirements for the next two years:

(*a*) Furnishing quarters in new building.....		$1,000.00
(*b*) Alternating current dynamo.....		700.00
(*c*) Equipment for junior laboratory.....		
(1) Bridges.....	$300.00	
(2) Thomson balance.....	250.00	
(3) Duplicate instruments.....	300.00	
(4) Galvanometers.....	150.00	
(5) Station switches, automatic cut-outs and lightning arresters.....	130.00	
(6) Electrometers.....	75.00	
(7) Recording Watt meter.....	200.00	
(8) Electrostatic voltmeter.....	240.00	
(9) Photometer for arc and incandescent light.....	350.00	
(10) Station ammeter and voltmeter....	100.00	
(11) Shunt for ammeter.....	75.00	
(12) Thomson Wattmeter.....	75.00	
(13) Thomson Wattmeter, 100 amperes..	30.00	
		$2,175.00
Total appropriation desired.....		$3,875.00

Respectfully submitted,

JAMES S. STEVENS,
Professor of Physics.

REPORT OF THE DEPARTMENT OF CHEMISTRY.

President A. W. Harris:

SIR:—The course of instruction in the department of Chemistry during the spring term, 1895, consisted of: general chemistry for the freshman class, which was divided into three sections, reciting to myself, Mr. Colby and Mr. Jackman; a class in advanced chemistry for the sophomores reciting to Mr. Colby; a class in advanced organic chemistry for the seniors reciting to myself, a senior class in laboratory processes reciting to myself, a class of seniors in the preparation of organic compounds also under my care.

The laboratories were open in the morning and afternoon and were under the care of myself and Mr. Colby.

During the fall term, 1895, a section of the freshmen in general chemistry, juniors in advanced chemistry and seniors in advanced chemistry, recited to me. A section of the freshmen in general chemistry and a section of the sophomores in chemical theory recited to Mr. Colby, who also had charge of the seniors in mineralogy and photography.

During this term the laboratories were open both forenoon and afternoon and were under the supervision of myself, Mr. Colby and Mr. Jackman.

In the spring term, 1896, the classes reciting to me consisted of a section of the freshmen in general chemistry, the juniors in advanced chemistry and in chemical readings and the seniors in advanced organic chemistry. Mr. Colby held recitations in general chemistry for the freshmen and in advanced chemistry for the sophomores.

The laboratories were open morning and afternoon and were under the joint care of myself, Mr. Colby and Mr. Jackman.

During the fall term I held recitations in general chemistry for two sections of the freshman class, in German chemical readings for a class of juniors, in elementary organic chemistry for a section of the junior class, in advanced organic chemistry for a class of seniors who also attended my lectures on laboratory processes and the determination of organic functions.

Mr. Colby held recitations in general chemistry for a section of the freshman class, in chemical theory for a class of sophomores and in advanced chemistry for a section of the junior class.

The laboratories under our joint care were open both morning and afternoon.

By referring to the catalogue it will be seen that this department offers a large number of courses which greatly increase the work of the professor and instructor, making it necessary for them to be present at the college during almost every, if not every, hour of the forenoon and during the whole of the afternoon session which has been lengthened by an hour. Even with this constant attendance it has been impossible for us to attend to all the courses of laboratory work. In view of these facts I would respectfully suggest that a little help be given us in the laboratory, if not in the classroom.

At the commencement in June, 1895, Mr. Ora W. Knight graduated from this department with the degree of B. S.—presenting a thesis upon: "American Portland Cements, their Manufacture and Analysis," embodying the results of a number of complete analyses. At the commencement in June, 1896, Mr. F. P. Pride graduated with the degree of B. S.—presenting a thesis on "Water Analysis," embodying some analytical results.

The progress for the past two years has, on the whole, been satisfactory, although since the fire of last fall our facilities for work have been much reduced and we have been so cramped for room that two students have had to work in the store room and one in the office and private laboratory.

With the new arrangement of the laboratories no provision has been made for an office and private laboratory for the professor of chemistry. I would therefore suggest that the old store room, which could easily be connected with the quantitative

laboratory, be devoted to that purpose. The sum of $200 would I think, be sufficient to make the necessary changes. With the enlarged and separated laboratories, each accommodating sixty-four students, it is evident that additions must be made to our stock of glassware, chemicals and special apparatus; this is an absolute necessity with our large and increasing classes. The most urgent needs are the following: Three new analytical balances should be added to our present outfit, a large apparatus for distilling water, a modern sugar polariscope, an improved chemist's refractometer, some special apparatus used in the making of organic and inorganic preparations, a supply of the necessary organic and inorganic chemicals necessary for making the above preparations, a cabinet of the elements and one of the commoner alkaloids and other organic compounds, normal thermometers for high temperatures, steam cups, oil baths, water and air ovens, gasoline gas lamps, blast lamps, lecture apparatus, charts, supports, lampstands, tripods, platinum ware, some apparatus for electrolytic analysis, a Bunte gas burette and smaller pieces of ordinary glassware and chemicals. The amount necessary for the purchase would not amount to more than $1,797.

I would urge the purchase of a complete set of The Chemical News at an early date. The cost need not exceed $140.

For mineralogy, Mr. Colby reports as necessary the addition of sets of minerals illustrating cleavage, structure, lustre, fracture, etc., and costing $56.75; a college collection of minerals and ores costing $200; a specific gravity balance, $25; apparatus, vials, books, and glassware costing $200; making a total of $481.75.

For photography, he reports the following as absolutely necessary for good work; an enlarging and copying camera (10x12), price $48; lens for same, $25; Watkins exposure meter, $6.50; print washer, $7.50; trimming board, $15.00; flash lamp, $5.00; micro camera, $40; camera stand, $30; books, $25; apparatus for X-ray photography, $150; making a total of $352.

The pharmacy courses were organized in the fall term of 1895, starting with ten students in the short (two year) course, and three in the junior year of the four year course. The

entering class this year increased to fifteen in the two year course, and remained unchanged in the junior year of the four year course. Since distinctively pharmaceutical work is not begun in the four year course until the junior year, that year is compared with the first year of the short course.

Three of the students from the first year's class have dropped out. In one case the student's success in passing with high mark the State Commission of Pharmacy (having previously failed to pass) unfortunately determined him not to return for his second year.

There were no specific entrance requirements for the short course last year, which is the case with most pharmaceutical colleges in this country. Notwithstanding the quite advanced requirements this year the number entering (as above noted) has increased, and the ability to do satisfactory work and to get commensurate good from the course has correspondingly increased. The wisdom of the above change is therefore apparent.

The short course represents, in general, the full course of the usual pharmaceutical colleges. However a careful comparison in the subjects taught, actual laboratory hours put in, length of course, undivided attention and continuous attendance required, will show that there are few courses that at all approach ours in extent and thoroughness. Not stopping to note the excellent courses in physics or volumetric analysis, especial attention is called to the modern, timely and thorough courses in biological chemistry and in bacteriology. With very few exceptions they are not represented in the curricula of the American pharmaceutical colleges.

That the ideal and logical place for pharmacy is in the state college, and in contact with the other scientific branches there taught, need not be argued. In this State the wisdom of the plan has been seen and adopted. The establishment of a private college of pharmacy involves great expense, and for income the student's fee is the main feature. Hence numbers are of prime importance, and the temptation to lower the grade of work is great. The state college has nearly all the necessary teaching force, buildings, libraries, laboratories and equipment, and a small annual sum suffices to cover the additional

expenses of the course. Neither is there the temptation to graduate unfit men, or to lower standards to attract greater numbers for the resultant fees. Hence it need surprise none that the private college usually suffers by comparison with the state college.

As to the expense of maintaining the course in pharmacy, its establishment has thus far required but a single addition to the teaching force of the college; and as might be shown his aid would be at least urgently needed in the Department of Chemistry, even if the course in pharmacy did not exist. Outside of his salary therefore for the maintenance of this new department there has been expended: For crude drugs and pharmacognosy samples, $65.39; for books and journals added to library, $82.45; to which may be added as appropriated but not yet actually expended: for equipment of pharmacy laboratory and crude drugs, $70; for books and journals for library, $24; making a total expenditure (actual and prospective) of $241.84. As next term is largely provided for, this represents nearly two college years.

The current needs of the department for the future will be mostly for crude drugs for the laboratory of pharmacy and occasionally small apparatus—of the latter there is but little at present. The greatest need, however, will be standard books and journals. A well equipped reference library is the most essential requisite for thorough work in any scientific laboratory, whether of pure or applied chemistry. But books however good rapidly become obsolete. The most permanently valuable possessions are standard journals, containing original papers. In good reference literature the library is at present weak. Here one department helps another however. Whatever is added to the Department of Chemistry's library is helpful to pharmacy also, pharmacy being but a special branch of applied chemistry.

Of the books added by the Pharmacy Department nearly all are sufficiently non-technical to be valuable aids to other departments also, particularly to the chemical, agricultural and pre-medical departments. Two journals are sent free, Meyer Brothers' Druggist, sent by Meyer Brothers of St. Louis; and Pharmacal Notes, sent by Parke, Davis & Co., of Detroit.

In conclusion, it is estimated that $200 per year will cover all normal current expenses of the pharmacy laboratory, furnishing sufficient crude drugs and other stock, and that $75 per year will soon—though not immediately—place the library branch of the department on good working footing. The aim has been to confine expenses to the smallest sum possible to run it without crippling its efficiency. It is believed the facts are in harmony with the aim. While showy furnishings or elaborate museums might impress visitors it is not felt that their educational value warrants the expense of providing them; nor is it believed the student body will be less efficient for their absence. Let what is spent be spent for actual material for work, and in building up a strong reference library, and we can well trust to the future for the fruition of our hopes.

All of which is very respectfully submitted.

A. B. AUBERT,
Professor of Chemistry.

REPORT OF THE DEPARTMENT OF NATURAL HISTORY.

President A. W. Harris:

SIR:—I have the honor of submitting the following report of the Department of Natural History for the two years ending December, 1896.

CLASS WORK. There have been few changes in class work since my last report. These have been principally in the direction of a wider range of electives and the opportunity of specializing in the junior and senior years.

The increased number of students has awakened a greater interest in class and laboratory practice, and at no time before have I had so many pupils doing advanced and special work.

During 1896 I taught general botany and plant histology on account of Professor Munson's absence. Courses in natural history were maintained during the sessions of the summer school in both 1895 and 1896. In 1895 I delivered fifteen lectures on injurious insects and fungi to the winter students in Agriculture, in 1896 I delivered thirty.

During the two years Mr. O. W. Knight rendered satisfactory assistance in herbarium and museum work as assistant in natural history. He resigned December 1, 1896, to accept a more lucrative position. In his place, Mr. E. D. Merrill, Mr. O. O. Stover and Mr. P. L. Ricker, students in natural history, are rendering valuable assistance in the herbarium, museum and laboratory.

ORIGINAL WORK. In addition to the conduct of recitations and laboratory classes, the work of the department has been as follows: (a) The life histories of plants and animals; (b) Classification of botanical and animal material for the extension of herbarium and museum; (c) The preparation of slides to illus-

trate class and laboratory work; (d) The collection of plants and animals; (e) The determination of plants and animals sent to the college to be named; (f) The preparation of articles for scientific journals, newspapers, and of bulletins for the department; (g) Public lectures on natural history topics.

The following articles are some of those published during the past two years: Contribution to the Characeous Plants of Maine, Torr. Bull. September, 1895; Contributions to the Lichens of Maine, II, Torr. Bull., 1896; The Cranberries of Maine, State Pomological Society Report, 1895-6; Contribution to the Pyrenomycetes of Maine, I, Torr. Bull. February, 1896; Notes on Maine Plants, Torr. Bull. July, 1896; Contributions to the Myxogasters of Maine, I, Torr. Bull. August, 1896; A Thysanuran of the Genus Anura, Psyche, September, 1896.

EXPLORING WORK. In August, 1896, Mr. O. W. Knight and I spent about ten days on the Canadian border, collecting plants, insects, and other zoological specimens. We obtained several hundred species of plants, insects and other animal forms. Of these over 100 were new to the college collections, several new to the State and one new to science. Several interesting facts in geographical distribution were recorded.

A trip was made to the Monson slate quarries and a fine set of specimens and photographs secured. During a trip in Penobscot bay a number of marine forms new to the museum were collected beside material for class and laboratory use. We are under obligations to the officers of the Canadian Pacific and Bangor and Aroostook Railroads for passes.

HERBARIUM WORK. The herbarium is in good order. Collections made by Mr. Knight, myself, and many students, have been elaborated. The collections of weeds and forage plants and seeds have been considerably extended. There have been added during the past two years by purchase, exchange, collecting and donations, 977 specimens. Collections of plants, amounting to 3,500 specimens in all, have been distributed as follows: Hampden Academy, Castine Normal School, Ricker Classical Institute, Guilford High School, Bar Harbor High School, Westbrook Natural History Society.

MUSEUM. The growth of the museum during the last two years has been very small on account of a want of funds, but

considerable work has been done in classifying, rearranging, and registering material already on hand. There have been added as folllows: Mammals, two; birds, forty-one; reptiles, eight; fishes, three; invertebrates, several hundred insects and many marine forms.

ESTIMATES.

Herbarium. Fascicles of plants subscribed for, materials for preparing and mounting plants, and expense of conducting exchanges	$200 00
Museum. To extend collection of Maine animals, preservatives, jars, and other supplies.	500 00
Microscopes, and accessories	400 00
Microtomes, various pieces of apparatus	250 00
Work tables for twenty students	250 00
Anatomy and Physiology. Chemicals, apparatus, models, charts, etc	200 00
Reference books	200 00
Exploring	300 00
	$2,300 00

Respectfully submitted,

F. L. HARVEY,
Professor of Natural History.

REPORT OF THE DEPARTMENT OF AGRICULTURE.

President A. W. Harris:

SIR:—The work in agriculture includes both instruction and investigation. The instruction is given by the departments of Natural History (economic botany and entomology), Horticulture, Animal Industry, Bacteriology and Veterinary Science, and Agriculture (agricultural chemistry.) The work of investigation is carried on by the Agricultural Experiment Station. The general charge of the work, including both instruction and investigation, is placed in my care, and beginning with next January the management of the farm will also come under this department. There are many obvious advantages in this arrangement whereby unity of purpose and economy are insured.

The facilities for instruction in agriculture have never been better in the history of the College. No better courses in agriculture are to be found in the east than are here offered. Although the efforts which are made to obtain students in agriculture meet with only partial success, this is not the fault of the College or the department.

The students, who have graduated from this department, though few in number, have contributed greatly to the advances made in agriculture. The very fact that only a few students are taking the courses in agriculture shows that great effort is needed to help the industry which it serves, and also shows the importance of maintaining and increasing the facilities of instruction in this department, in order to make it as attractive as possible. These few students are the "leaven" which shall leaven the whole.

The work of investigation at the Experiment Station is chiefly along the lines of plant and animal nutrition, the diseases of plants and animals, and injurious insects and fungi. The nutrition of plants is studied by means of field, pot and box experiments. The studies upon the nutrition of animals includes feeding experiments, digestion experiments and the studies of animal products, as milk, beef, etc. Investigations upon the food of man, including the chemistry of food, its preparations and digestibility, are also being made. Meteorological observations, including temperature, humidity, rain or snow fall, barometric readings, direction and velocity of the wind are taken thrice daily by the Station.

By law the inspection of fertilizers and of glassware used in creameries is made a part of the duty of the director of the Station. This "control" is a very valuable part of the work of the Station.

Two annual reports and fourteen bulletins, making a total of four hundred and fifty-four printed pages, have been published by the Station in the past two years. The following selected titles of articles in these publications will gve an idea of the scope of the work of the Station:

Inspection of Fertilizers; Inspection of Glassware for Creameries; Analyses of Fodders; Analyses of Butter and Milk; Feeding Experiments with Milch Cows; Digestion Experiments with Animals; Relation of Food to Growth and Composition of Steers; Silage Crops; Forcing Tomatoes for Winter; Spraying for Fungi and Insects; Plant Breeding; Injurious Insects; Currant Fly; Plant Diseases; Weeds; Tuberculin as a Diagnostic Agent; Foraging Power of Agricultural Plants for Phosphoric Acid.

The Agricultural Department of the College, more than all others, is doing a large and increasing amount of general educational work among the farmers of the State. The head of the department is ex-officio a member of the State Board of Agriculture and is, in this way, put in touch with the best agriculture of the State. The large correspondence between this department and the more intelligent and progressive farmers of the State, and the work which the members of the department are doing in farmers' institutes and conferences,

and in lectures before granges and other bodies, are ways in which the educational facilities of the College are used to promote better agricultural thought and practice among the farmers of the State. The great advance made by our farmers, particularly in the last decade, is largely traceable to the work of the Agricultural Department of the College.

CHARLES D. WOODS,
Professor of Agriculture and Director of the Station.

REPORT OF THE DEPARTMENT OF ANIMAL INDUSTRY.

President A. W. Harris:

SIR:—Since my last report, as in previous years, my duties have consisted in giving instruction in stock breeding, stock feeding, dairying, poultry industry and agricultural engineering, and in addition the superintendence of the college farm.

The farm fields contain eighty acres, and the pastures and paddocks forty acres more.

The crops, the present year, were ninety tons of hay, fifteen tons of oat silage, eighty tons of corn silage and one hundred bushels of potatoes. The hay crop was very much reduced this year, here as elsewhere, as an average crop should have been about one hundred and fifty tons.

The present stock of the farm and the Experiment Station consists of eleven cows, three heifers, one pair of Percheron mares, twenty Shropshire sheep and ten swine.

Last spring when the tuberculin test was applied to the herd of cattle a large number of them reacted, although they were apparently in perfect health. All that reacted (nine) were separated from the herd and put by themselves, in the river pasture, some eighty rods distant from the farm barns and home pasture, where they have since been kept. A barn has just been erected there and they are to be kept isolated and their cases studied by the veterinarian of the college. In order to destroy any germs of disease that might remain in the large barn where these animals had been wintered, it was deemed advisable to remove all of the floors, mangers and much of the ceiling so that every part might be exposed for disinfection. By the use of a large force pump and hose the whole interior of the building, from ridge-pole to cellar, was kept constantly wet

for four days with a strong solution of corrosive sublimate. The animals remaining in the herd were tested recently with tuberculin and none reacted. The parts of the barn that were removed have not been replaced. It is necessary that this should be done so that cattle may occupy it this winter. When the cellar of this barn was made it was largely excavated from the solid ledge and provided with a sufficient drain. Much of the surface of the ledge inclines towards the barn and much water has found its way into the cellar and leached the manure, in spite of earnest efforts to prevent it. The cellar is ten feet deep and as the room can be afforded it was decided to fill in two feet in depth over the cellar bottom with stones and cover them with a heavy coat of cement, thus securing complete drainage and a permanently dry cellar. The farm teams and men are now drawing in and placing the stones.

The cost of cementing the cellar, and the woodwork before mentioned will probably amount to seven hundred dollars. The farm buildings all need painting outside, which will probably cost three hundred and fifty dollars.

Instruction with the students in the full course in agriculture comes in their junior and senior years and is given by text-books, lectures and practical contact with the subjects taught. The short course students in agriculture are here mostly in the winter vacation and consequently do not interfere with the work of the regular course men. With these students the aim is to make the instruction practical and to try to do them the most good without subjecting them to regular class-room drill. The facilities for instruction in many respects are good. The dairy building and its equipment are well adapted to instruction purposes and experimental work. In order to keep pace with dairy advancement we need a combined churn and butter worker costing about one hundred dollars. This building needs a new floor, the present one being leaky and difficult to keep clean. The woodwork has never been filled or painted and it is rough and defaced by the steam and necessary cleaning. The painting and floor will probably cost one hundred dollars. The accommodations for instruction in stock breeding are not as they should be. Part of the instruction is given in the lecture-

room, but the larger part should be given with the living animal before the students, for judging and discussion.

The tool house where the machinery of this and the Horticultural Department is stored is twenty-five by sixty feet, with two floors, and it is entirely inadequate for the purpose. Manufacturers of agricultural machinery and implements have freely responded to my requests and placed their machines here free of cost to the college. Among them are plows, harrows, planters, seeders, cultivators, harvesters, mowing machines, potato planters and diggers, hay loader, hay unloader, horse power, and cream separators. These machines are all used in the practical work of the farm and the students come directly in contact with them, operating them in the fields and familiarizing themselves with the machines and their practical value as economizers of labor. There are several new machines that have recently been brought out that we need, in order to keep pace with the advance of agricultural thought and practice, which can be secured free of cost. We need this machinery and we ought to provide a suitable place in which to exhibit it. The short course students are here only in the winter months and unless we have floor room in which to set up each machine and show it, they can get but little value from the study. I think a building twenty-five by eighty feet with two floors, costing, probably, one thousand dollars, would be sufficient for this purpose, and also contain the room for the study of cattle breeding, before mentioned.

Two years ago I asked for an appropriation for the buildings for a poultry plant. I am now more than ever convinced of its value and necessity. Instruction in poultry industry has consisted wholly of lectures. We have no plant aside from some small pens and a few dozen pure bred birds. The importance of the poultry industry of the State and its possibilities; its adaptation to the farm as a side interest; and its importance as a special line of work for men of limited means who desire to engage in a business of their own, together with the numerous letters of inquiry received here relative to the business, seem to require that we be equipped with such buildings and appliances as will enable us to give instruction and training. The buildings should be erected in a plain substantial manner so as to secure the best accommodations at the least possible outlay.

They should be just such buildings as a practical poultry man should build for himself. This plant should be on a scale sufficiently extensive to give employment to one man throughout the year in order to yield such financial results as would be satisfactory. A breeding house sixteen feet wide and four hundred feet long will accommodate eight hundred hens. Ten double brooder houses, each six by twelve feet, will furnish room for fifteen hundred chickens. These buildings complete can be constructed for about fifteen hundred dollars. I regard the establishment of this plant as the most essential need of the department.

Respectfully,

G. M. GOWELL,
Professor of Animal Industry.

REPORT OF THE DEPARTMENT OF BIOLOGY.

President A. W. Harris:

SIR:—Since the last report there have been some changes in the work of this department. An elementary laboratory course in bacteriology has been provided for sophomore students in agriculture, preparatory medicine, science, and pharmacy and for seniors in chemistry. In 1895 we had one student from the Science Course who took this work. In 1896 there were seventeen students from different courses, more than could well be accommodated in the only laboratory that was available and the success of the course was also much interfered with for lack of needed apparatus.

As instructor in veterinary science my work has been twenty lectures before the short course winter students in agriculture and fifty lectures before the senior students in the regular course in agriculture.

In bacteriology I have had charge of the laboratory work for five weeks, ten hours a week.

The courses of study as now arranged call for an advanced laboratory course in bacteriology for the senior preparatory medical students, a laboratory course in animal histology for preparatory medical seniors, a course of dissecting for the agricultural senior students, five lectures on bacteriology before the short winter course students in agriculture and horticulture, twenty lectures before the short course students in dairying, fifty lectures on veterinary science before the agricultural and preparatory medical seniors, two courses of fifteen and twenty lectures on veterinary science before the short course winter students.

To provide for the successful carrying on of the work in bacteriology there is urgent need of one thousand dollars'

worth of apparatus consisting chiefly of microscopes, a thermostat, sterilizers and glassware.

The work in bacteriology is new work at this institution and has not yet received anything like a fair equipment of apparatus and the work required in this line for the coming year is more than double what we have yet attempted.

For the work in animal histology and dissecting which is also new work, two hundred dollars' worth of apparatus is needed.

We also need for models instruments and prepared specimens to illustrate lectures in veterinary science about one hundred and fifty dollars.

Respectfully submitted,

F. L. RUSSELL,
Instructor in Biology.

REPORT OF THE DEPARTMENT OF HORTICULTURE.

President A. W. Harris:

SIR:—The work of the Horticultural Department since my last report has not been essentially different from that in previous years. To the work of instruction has been added, however, the course in elementary botany formerly given by the assistant in natural history, and a short course in the histology of plants. Aside from regular instruction in college some work has been done at farmer's institutes. As in the past, much attention has been given to the changes in the campus, and the results of this work are now becoming apparent. In 1895 more than two thousand trees and shrubs were planted. The most prominent change made, is in the vicinity of the president's house. By grading, and making radical changes in the drives an attractive lawn has been provided. The building of the Kappa Sigma House necessitated the construction of a new drive and of a lawn of considerable extent. This work is not quite completed.

The area in the vicinity of the house occupied by the professor of chemistry had become so infested with the orange hawkweed that it has been deemed best to keep it under cultivation for a time. This will enable us to put it in good condition for lawn in the future.

The greatly increased area now included within the limits of the campus renders the cost of maintenance much higher than formerly. At least $500 per year will be required to keep the lawns and drives in good condition.

Much has been done toward making the campus what it should be—the best in the State; much, however, remains to be done. The opening of the electric railway from Bangor to

Old Town renders doubly important the work of planting and of smoothing those portions of the grounds bordering on the highway, as the college will, in a measure, be judged by its external appearance.

It seems desirable that the portion of the public highway passing through the college property should be made a part of the system of college drives, and I would recommend that if possible an arrangement be made with the town authorities whereby the college shall take charge of this road—the town to pay a certain part of the cost of maintenance. To make the needed permanent improvements suggested and purchase trees and shrubs, will require at least $2,000.

The large increase in the number of students taking botany necessitates additional equipment. Several microscopes, a microtome, a turn-table, dehydrating apparatus, slides, and various re-agents are needed at once.

In my last report I asked for provision for storage of tools, nursery stock, etc. A part of the root-cellar in the college barn has been assigned to the horticultural department and it serves the latter purpose very well; but no provision has been made for the tools. I would urge that an addition be built to the present tool-house.

I have hitherto expressed the wish that more work might be undertaken in the direction of floriculture. At present such work is being undertaken and more decorative plants are now grown than ever before. The green-houses are in very good condition, but will soon need new floors. A cement floor is also needed in the work-room. The cost of these and the other immediate needs of the department will be appended.

Mr. H. P. Gould, who was my assistant during the past four years, has resigned to pursue graduate studies at Cornell University. Mr. Gould was faithful and efficient in the discharge of his duties and I regretted his departure. His place is taken by Mr. L. J. Shepard, a graduate of the Massachusetts Agricultural College.

In conclusion, I wish to express to yourself and the trustees, my appreciation of the opportunity for study granted last year. The time was very profitably spent at Cornell University.

NEEDS OF HORTICULTURAL DEPARTMENT.

Submitted Oct. 31, 1896.

Improvement of grounds	$2,000.00
Cement floors in greenhouses	150.00
5 compound microscopes	187.00
1 compound microscope	77.50
1 microtome	60.00
1 Abbé camera lucida	15.00
1 self-centering turn-table	6.00
1 Thomas' dehydrating apparatus	7.50
Reference books, for laboratory use	50.00

Respectfully submitted,

WELTON M. MUNSON,
Professor of Horticulture.

REPORT OF THE DEPARTMENT OF CIVIL ENGINEERING.

President A. W. Harris:

SIR:—I have the honor to submit the following report for the Department of Civil Engineering:

Since my last report the work of this department has gone on as usual, with the exception of some annoyance from the re-arrangement of the studies, rendered necessary for the accommodation of the additional courses. In the absence of Assistant Professor Grover, his duties have been performed, to the entire satisfaction of all concerned, by Mr. E. D. Cummings, a graduate from Cornell University, and a man who has had considerable experience in the designing and erection of bridges. With the means at our disposal, as much new apparatus as possible has been added to the equipment of the department. Several small pieces of apparatus have been designed and manufactured at the college work-shop, and thereby much expense saved. We have designed and constructed a machine for testing the strength and stiffness of wooden beams, eight feet long by eight inches cross-section area, which gives perfectly reliable results, and is not expensive.

Until the present time, this department has not felt the effect of the great increase in the number of students at the college, for the reason that, until the third year in their course, they do not get fully into the work of the department. Next year our numbers will be so increased that the ordinary surveying and engineering apparatus must be more than doubled, in order to enable us to do justice to those who desire to take the course.

It may not seem apparent to those unacquainted either with the method of engineering field work, or engineering instruction, why so many instruments, essentially of the same type,

should be needed. In explanation I would say, that a transit party for engineering field work is made up of from five to eight men, but the only man who gets any considerable instruction, as an engineer, is the one at the transit. A leveling party is made up of only two men. Each party must have a set of instruments; so it will be seen that, with a large class, several instruments of the same kind must be at hand. Heretofore our supply of instruments has been small, but has served our purpose. Hereafter to enable us to go on successfully with our increased numbers, we need the following list of new instruments, which is appended with prices:

Transits.	
One Buff & Berger	$230.00
" Heller & Brightly	230.00
" 8" transit for triangulation	450.00
" Gurley	230.00
" Young's railroad transit	180.00
" surveyor's compass	50.00
Levels.	
One Heller & Brightly	150.00
" Dumpy	100.00
Leveling Rods, etc.	
Two leveling rods	35.00
Flags, tapes, pins and axes	50.00
Pantograph	60.00
Rolling parallel rule	25.00
Vernier protractor	20.00
Boat for field work in hydraulics	50.00
Case of drawers for designing room	100.00
Six drawing tables for designing room	50.00
Drawings and samples of details for illustration in bridge design	200.00
Base measuring apparatus, for higher surveying	200.00
Hydraulic apparatus, for testing laboratory, to be constructed here	400.00
	$2,810.00

It is very difficult to teach a student how to design an engineering structure, a typical example of which he has never seen.

We are so situated here, that it is impossible to examine any kind of an engineering structure, except bridges, and we are indebted to the authorities of the M. C. R. R. for transportation to and from these in the past. In connection with these examinations a visit to some large bridge manufactory would be of the greatest advantage to the engineering classes. No such shops, however, can be seen this side of Boston, and the expense of a trip there is too great for the students to wholly bear. If a sum sufficient to pay their railroad fare could be appropriated, it would add very greatly to the value of the course in designing.

As the construction and repair of the buildings is a part of my duties, I wish to say that although extensive repairs have been made on some of the buildings during the last two years, yet there are many others which should be attended to at once, or the buildings will deteriorate. Those needing attention first, are the two houses which belonged to the two farms of which the college campus is composed, and which are now occupied by two of the college societies as chapter houses. The cellar walls of both of these houses will have to be taken down and relaid very soon. The floor timbers of these houses are also badly decayed, and will soon have to be renewed. The stand pipe of the water supply system needs painting both outside and in. The tin roof of the engineering building needs painting, and the iron roof of the pumping station will have to be renewed in the spring.

It is extremely important that better and more convenient access to the quarters for the storage of the fire protection appatus should be provided at once. The efficient service which this apparatus has rendered the college in the past is sufficient guarantee of its work and importance.

GEO. H. HAMLIN,
Professor of Civil Engineering.

REPORT OF THE DEPARTMENT OF MECHANICAL ENGINEERING.

President A. W. Harris:

SIR:—I hereby present the report of the Department of Mechanical Engineering for the past two years:

With the money received a new Hamilton Corliss engine of about 60-horse power and an 85-horse power Heine water tube boiler were purchased and placed in position. They have been in constant service a year and a half and have given good satisfaction. The power is now ample for all purposes.

The problem of increasing the capacity of the shops and drawing rooms again comes up and it is imperative that some arrangement should be made at once in order to accommodate the constantly increasing classes.

The work of the mechanical and electrical engineering courses is so similar that there seems to be no reason why the two departments should not occupy the same building. Both need power for shop work and laboratory instruction.

For this purpose a building should be constructed which should contain the shops, an electrical laboratory, a mechanical laboratory, and the light station on the first floor, recitation rooms and offices for the two departments on the second floor, and drawing rooms on the third floor. A short distance from this building should be located a boiler house large enough to contain boilers for heating the whole college, and the coal for a year.

Grateful acknowledgment is hereby made to Mr. C. C. Garland, for photographs of locomotives made by Manchester Locomotive Works.

Respectfully submitted,

WALTER FLINT,
Professor of Mechanical Engineering.

REPORT OF THE MILITARY DEPARTMENT.

President A. W. Harris:

SIR:—I have the honor to submit this, my first annual report of the Military Department.

I reported for duty at the college October 23, 1896, and my report will necessarily be short as compared with those of my predecessors.

I find that the season for out-door drill is over and that there is no drill hall in which military exercises can be carried on during the winter months. I regard a suitable drill hall as the greatest need of the department and of the college. Properly constructed it will also furnish a good gymnasium, a feature which is entirely lacking in the college at present.

The college has outgrown its dormitories and cadets now seek quarters in Orono and Old Town, many of them at a distance of two miles from the college. They should not be required to carry their arms and accoutrements to their homes each day and yet there is absolutely no provision for their care at the college. A suitable room could be provided in the drill hall for this purpose.

The corps of cadets is now organized into a battalion of four companies, band and signal detachment, with a staff consisting of a major, adjutant, and quartermaster. The band is a very essential part of the organization, and the continuation of the appropriation for its support is recommended. It is necessary to hire an instructor for a short period each year and a small sum is necessary for the purchase and repair of instruments. The amount of $250 is recommended.

An appropriation of $200 for the current expenses of the target range is recommended, also $200 for the annual encampment of the battalion, and for office and incidental expenses,

$100. It is thought that these amounts, with economy, will be sufficient for the two years ending December 31, 1898.

I have as yet been unable to secure suitable quarters, or in fact quarters of any kind, near the college, and am likely to be greatly hampered in my work this winter by my failure. Being in charge of the dormitories, and in close touch with every student of the college it seems to me important that suitable quarters should be provided for the military instructor. The sum of $3,500 would build a set of quarters such as is usually provided for an officer's use at a military post. My immediate predecessor lived in Bangor, some nine miles from the college.

The following is a summary of the current needs of the military department during the coming two years:

Band, $250; target range, $200; encampment, $200; office and incidental expenses $100; total, $750.

Very respectfully,

Your obedient servant,

HERBERT N. ROYDEN,
2nd Lieut., 23rd Infantry,
Professor Military Science and Tactics.

REPORT OF THE LIBRARIAN.

President A. W. Harris:

SIR:—During the last two years 1,520 volumes have been added to the library, making the total number 9,890. There have also been large additions to the pamphlet collection, which must number between 3,000 and 4,000.

The new books are classified as follows: General works, 22; agriculture, 75; astronomy, 15; biography, 90; biology. 7; botany, 9; chemical technology, 1; chemistry, 11; customs, 7; education, 38; electricity and electrical engineering, 34; engineering, 48; ethnology, 6; fine arts, 20; geology, 29; history, 105; horticulture, 21; law, 29; literature (general), 11; American literature, 38; English literature, 156; French literature, 76; German literature, 47; Italian literature, 15; Latin literature, 2; oriental literature, 3; Russian literature, 8; Scandinavian literature, 9; Spanish literature, 5; mathematics, 7; medicine, 14; meteorology, 1; military science, 17; patents, 18; periodicals, 205; pharmacy, 14; philology, 29; philosophy, 25; physics, 27; political economy, 48; public documents, 33; religion, 23; science (general), 23; sociology, 10; sports, 4; travel and geography, 35; useful arts, 28; veterinary science, 1; zoology, 12.

Our list of periodicals also shows very satisfactory growth. There are now on file in the library 97 magazines, reviews, etc., the majority of them technical. These may be classified as follows: General, 19; agriculture, 7; art, 5; astronomy, 2; botany, 2; chemistry, 3; civics, 2; civil engineering, 5; education, 2; electrical engineering, 5; entomology, 3; geology, 3; history, 1; horticulture, 5; literature, 2; mathematics, 1; medicine, 2; mechanical engineering, 6; microscopy, 2; military science, 1; pharmacy, 4; philology, 1; philosophy, 2; physics, 4; science (general), 5; sports, 1; useful arts, 2.

While the growth in the facilities and use of the library has been satisfactory, a much more rapid growth is very desirable; at least 1,000 volumes a year should be added to the library to keep in line with the growth of the college in other directions. The collection of books in many subjects is no more than a nucleus of what the library should contain.

It seems very proper that the state college library should contain a good collection of Maine literature, books about the State, by Maine authors, etc. I would recommend that at as early a date as practicable a special appropriation be made for the starting of such a collection.

The work of the students in library economy has been satisfactory. Five young women have received certificates, and two others are now pursuing the course. The instruction in this course, however, added to the specific duties of the librarian, and the work involved in the supplying of text-books, makes much more work than one person can do satisfactorily, hence I would respectfully ask to be relieved from the work of instruction in library economy.

Respectfully submitted,

HARRIET CONVERSE FERNALD,
Librarian.

THE MORE IMPORTANT LAWS RELATING TO THE COLLEGE.

THE LAND GRANT ACT.

An act donating lands to the several States and Territories which may provide colleges for the benefit of agriculture and the mechanic arts.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled. That there be granted to the several states, for the purposes hereinafter mentioned, an amount of public land, to be apportioned to each state a quantity equal to thirty thousand acres for each senator and representative in Congress to which the states are respectively entitled by the apportionment under the census of eighteen hundred and sixty. Provided, That no mineral lands shall be selected or purchased under the provisions of this act.

Sect. 2. And be it further enacted, That the land aforesaid, after being surveyed, shall be apportioned to the several states in sections or sub-divisions of sections, not less than one quarter of a section; and whenever there are public lands in a state subject to sale at private entry at one dollar and twenty-five cents per acre, the quantity to which said state shall be entitled shall be selected from such lands within the limits of such state, and the Secretary of the Interior is hereby directed to issue to each of the states in which there is not the quantity of public lands subject to sale at private entry at one dollar and twenty-five cents per acre, to which said state may be entitled under the provisions of this act, land scrip to the amount in acres for the deficiency of its distributive share; said scrip to be sold by said states and the proceeds thereof applied to the uses and purposes prescribed in this act, and for no other use or purpose whatever: Provided, That in no case shall any state to which land scrip may thus be issued be allowed to locate the same within the limits of any other state, or of any territory in the United States, but their assignees may thus locate said land scrip upon any of the unappropriated lands of the United States subject to sale at private entry at one dollar and twenty-five cents per acre: And provided further, That not more than one million acres shall be located by

such assignees in any one of the states: And provided further, That no such location shall be made before one year from the passage of this act.

Sect. 3. And be it further enacted, That all the expenses of management, superintendence, and taxes from date of selection of said lands, previous to their sales, and all expenses incurred in the management and disbursement of the moneys which may be received therefrom, shall be paid by the states to which they may belong, out of the treasury of said states, so that the entire proceeds of the sale of said lands shall be applied without any diminution whatever to the purposes hereinafter mentioned.

Sect. 4. And be it further enacted, That all moneys derived from the sale of the lands aforesaid by the state to which the lands are apportioned, and from the sales of land scrip hereinbefore provided for, shall be invested in stocks of the United States, or of the states, or some other safe stocks yielding not less than five per centum upon the par value of said stocks; and that the moneys so invested shall constitute a perpetual fund, the capital of which shall remain forever undiminished, (except so far as may be provided in section fifth of this act,) and the interest of which shall be inviolably appropriated, by each state which may 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.

Sect. 5. And be it further enacted, That the grant of land and land scrip hereby authorized shall be made on the following conditions, to which, as well as to the provisions hereinbefore contained, the previous assent of the several states shall be signified by legislative acts:

First. If any portion of the fund invested as provided by the foregoing section, or any portion of the interest thereon, shall, by any action or contingency, be diminshed or lost, it shall be replaced by the state to which it belongs, so that the capital of the fund shall remain forever undiminished; and the annual interest shall be regularly applied without diminution to the purposes mentioned in the fourth section of this act, except that a sum not exceeding ten per centum upon the amount received by any state under the provisions of this act, may be expended for the purchase of lands for sites or experimental farms, whenever authorized by the respective legislatures of said states.

Second. No portion of said fund, nor the interest thereon, shall be applied, directly or indirectly, under any pretence whatever, to the purchase, erection, preservation or repair of any building or buildings.

Third. Any state which may take and claim the benefit of the provisions of this act shall provide, within five years at least, not less than one college, as described in the fourth section of this act, or the grant to such state shall cease; and said state shall be bound to pay the United States the amount received of any lands previously sold, and that the title to purchasers under the state shall be valid.

Fourth. An annual report shall be made regarding the progress of each college, recording any improvements and experiments made, with their cost and results, and such other matters, including state industrial and economical statistics, as may be supposed useful; one copy of which shall be transmitted by mail, free, by each, to all the other colleges which may be endowed under the provisions of this act, and also one copy to the secretary of the interior.

Fifth. When lands shall be selected from those which have been raised to double the minimum price, in consequence of railroad grants, they shall be computed to the states at the maximum price, and the number of acres proportionally diminished.

Sixth. No state while in a condition of rebellion or insurrection against the government of the United States shall be entitled to the benefit of this act.

Seventh. No state shall be entitled to the benefits of this act, unless it shall express its acceptance thereof by its legislature within two years from the date of its approval by the president.

Sect. 6. And be it further enacted, That land scrip issued under the provisions of this act shall not be subject to location until after the first day of January, one thousand eight hundred and sixty-three.

Sect. 7. And be it further enacted, That the land officers shall receive the same fees for locating land scrip issued under the provisions of this act, as are now allowed for the location of military bounty land warrants under existing laws: Provided, Their maximum compensation shall not be thereby increased.

Sect. 8. And be it further enacted, That the governors of the several states to which scrip shall be issued under this act, shall be required to report annually to Congress all sales made of such scrip until the whole shall be disposed of, the amount received for the same, and what appropriation has been made of the proceeds.

Approved July 2, 1862.

STATE ACT ESTABLISHING THE COLLEGE.

Private and Special Laws of 1865, Chapter 532.

Sect. 1. Samuel F. Perley, N. T. Hill, Bradford Cummings, Thomas S. Lang, Dennis Moore, William D. Dana, S. L. Goodale, Robert Martin, Alfred S. Perkins, Joseph Farwell, Seward Dill, Joseph Day, Ebenezer Knowlton, Hannibal Hamlin, Charles A. Everett and William Wirt Virgin are hereby constituted a body politic and corporate, by the name of the Trustees of the State College of Agriculture and the Mechanic Arts, having succession as hereinafter provided, with power to establish and maintain, subject to the provisions and limitations of this act, such a college as is authorized and provided for, by the act of the Congress of the United States, passed on the second day of July, in the year eighteen hundred and sixty-two, entitled "an act donating lands to the several states and territories which may provide colleges for the benefit of agriculture and the mechanic arts." They shall be entitled to receive from the state the income which shall accrue from the funds granted to the state by the act aforesaid, and shall apply the same, together with all such income as they shall receive from any other sources, to the maintenance of the college in conformity with the act of Congress.

Sect. 2. The trustees shall annually elect one of their number to be president of the board. They shall appoint a clerk and treasurer, both of whom shall be sworn, and shall hold their offices at the pleasure of the trustees. The clerk shall record all proceedings of the board, and copies of their records certified by him shall be evidence in all cases in which the originals might be used. The treasurer shall be required to give suitable bond, and to renew the same whenever the trustees shall require.

Sect. 3. The governor and council shall at all times have power, 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. Whenever the governor and council shall have reason to believe that the trustees are exercising or attempting to exercise any unlawful powers, or unlawfully omitting to perform any legal duty, they may direct the attorney general to institute process against the trustees in their corporate capacity, in the nature of a complaint in equity before the supreme judicial court, in the county in which the college may be established, and the court, after notice, shall hear and determine the same by summary proceeding in term time, or by any judge in vacation, and may make any suitable decree restraining the trustees from performing or continuing the unlawful acts complained of, for requiring them to perform whatever is unlawfully omitted, and may enforce such decrees. In like manner a complaint may be instituted against any individual trustee, and be heard in the county where he resides, alleging against him any cause deemed by the governor and council sufficient to disqualify

him for the trust; and if in the judgment of the court such allegation shall be sustained, a decree shall be made removing such trustee from office, and his place shall be thereby vacated.

Sect. 4. No person shall be a trustee, who is not an inhabitant of this state, nor any one who has reached the age of seventy years. The clerk of the trustees shall give notice of all vacancies to the governor and council; vacancies occurring in any of the foregoing modes, or by the resignation or decease of any trustee, shall be filled in the following manner: The first vacancy that shall occur shall be filled by the legislature at the next session thereafter by joint ballot of the two branches; the second vacancy shall be filled by the trustees at their next meeting; and all succeeding vacancies shall be filled in like manner, alternately by the legislature and the trustees.

Sect. 5. The trustees, in their corporate capacity, may take and hold in addition to the income which they shall receive through the state from the endowment made by Congress, such other real and personal property as may be granted or devised to them for the purpose of promoting the objects of this act. But they shall not be entitled to receive any benefactions made to them upon conditions inconsistent with the act of Congress aforesaid, or for purposes different from what is therein prescribed.

Sect. 6. The governor and council shall take measures, as soon as may be advantageously done after the passage of this act, to sell the land scrip received by this state under the act of Congress, and to invest the same as required by the fourth section of said act. The securities shall be kept by the state treasurer, and he shall report annually to the legislature the amount and condition of the investments, and of the income of the same. He shall from time to time, as the income shall accrue, pay over the same to the treasurer of the college.

Sect. 7. It shall be the duty of the trustees, as soon as may be after their organization, to procure a tract of land suitable as a site for the establishment of the college. If no other provision shall be made therefor, there shall be placed at the disposal of the trustees for this purpose, such proportion as the governor and council may deem suitable, of that part of the fund which is authorized by the fifth section of the act of Congress to be expended for the purchase of lands for sites or experimental farms.

Sect. 8. The trustees shall appoint such directors, professors, lecturers and teachers in the college, and employ such other persons therein from time to time, as the means at their command may permit for the accomplishment of the objects enumerated and described in the fourth section of the act of Congress. Every officer and every person employed shall hold his office or employment at the pleasure of the trustees. They shall, as soon as may be, arrange and make known the several courses of instruction which they will undertake at the outset of the college, and shall enlarge and improve the same whenever practicable, subject to the limitations prescribed by Congress. They shall also establish the qualifications for admission, and

modify the same, as circumstances may require. But no student shall be admitted into or continued in the college, nor shall any person be employed in any office or service, who is not of good moral character and pure life.

Sect. 9. In addition to the instruction which is to be given by classes, text books, lectures and apparatus, in such branches of learning as are related to agriculture and the mechanic arts, the trustees shall provide, as fully as may be, for practical experiments and demonstrations of scientific principles and rules. They shall encourage, and for due proportions of time, at different seasons of the year, and with reference to other exercises, require all the students to engage in actual labor upon the lands and in the workshops with which the college may be furnished, and shall provide suitable oversight and direction in such labor, so that they may become habituated to skilful and productive industry.

Sect. 10. Military tactics shall be taught, during some suitable part of each year, to all the students; and they shall be required to form and maintain such habits of obedience and subordination as may be useful to them if called into military service. The adjutant general shall be authorized to furnish to the college, for military drill, such arms and equipments not needed by the state for other service, as may suffice for the number of students. He shall also furnish to the college a United States flag.

Sect. 11. Such other studies are to be taught, within the limitations of the act of Congress, as the facilities of the college, and the periods of instruction will permit.

Sect. 12. Students who satisfactorily complete any one or more of the prescribed courses of study, may receive public testimonials thereof, under the direction of the trustees, stating their proficiency.

Sect. 13. No charge shall be made for tuition, to any student who is an inhabitant of this state; and the trustees and all persons employed by them shall constantly endeavor, by the adoption of judicious and effective arrangements in all the labor departments of the college, to reduce the cost of subsistence to the students, and to render the institution, as far as possible, self-sustaining.

Sect. 14. It shall be the duty of the trustees, directors and teachers of the college, to impress on the minds of the students the principles of morality and justice and a sacred regard to truth; love to their country; humanity and universal benevolence; sobriety, industry and frugality, chastity, moderation and temperance, and all other virtues which are the ornaments of human society; and among other means to promote these ends, and to secure the best personal improvement of the students, the trustees shall provide, as fully as may be practicable, that the internal organization of the college shall be on the plan of one or more well regulated households and families, so that the students may be brought into relations of domestic intimacy and confidence with their teachers.

Sect. 15. If at any time, the number of students applying for admission shall be greater than the means of the trustees will enable

them to receive, they shall make regulations for the number to be admitted, having reference to the proportions of population in the several senatorial districts in the state, and equalize the admissions according to such proportions as nearly as may be.

Sect. 16. The trustees shall hold a regular session at the college at least once in each year; and may provide for periodical visitations by committees. No trustee shall receive any compensation, except actual travelling expenses to be paid from the treasury of the college.

Sect. 17. The treasurer of the college, shall make as often as once in six months, a detailed report of all receipts and expenditures, and the trustees shall cause the same to be verified by full inspection and settlement of all his accounts, and shall transmit a copy of the same as verified by them to the governor and council. The trustees shall also cause to be made annually such report as is required by the fifth section of the act of Congress, and communicate the same as therein provided.

Sect. 18. The legislature shall have the right to grant any further powers, to alter, limit or restrain any of the powers vested in the trustees of the college established by this act, as shall be judged necessary to promote the best interests thereof. And this act shall take effect upon its approval by the governor.

Private and Special Laws of 1867, Chapter 362.

Sect. 1. No vacancy occurring in the board of trustees of the State College of Agriculture and the Mechanic Arts shall hereafter be filled, until the number of said trustees shall be less than seven; and thereafterwards the number of said trustees shall be seven and no more.

Sect. 2. The appointment of the new board of trustees shall be made by the governor, with the advice and consent of the council. As soon as may be after the new board of trustees shall have been appointed, they shall designate by lot one of their number to hold office one year; one, two years; one, three years; one, four years; one, five years; one, six years, and one seven years, so that the office of one trustee shall become vacant every year. And thereafter, the term of office of every trustee shall be seven years; but any vacancy occurring by reason of death, resignation or otherwise, before the expiration of the term of office, shall be filled for the remainder of the term.

Sect. 3. All vacancies occurring in the board of trustees shall be filled by the governor and council, on the nomination of the trustees. In case the nomination by the trustees shall not be confirmed by the governor and council, the trustees shall make another nomination, and so on till the nomination shall be confirmed.

Sect. 4. All laws inconsistent with this act are hereby repealed. This law shall take effect upon its approval by the governor.

Approved February 25, 1867.

Private and Special Laws of 1872, Chapter 147.

Sect. 1. Females who possess the suitable qualifications for admission to the several classes, may be admitted as students in the college; subject to the requirements of labor and study, which may be determined by the faculty of instruction and by the trustees of the college.

Public Laws of 1874, Chapter 194.

Sect. 1. All vacancies occurring in the board of trustees of the State College of Agriculture and the Mechanic Arts shall be filled by the governor with the advice and consent of the council.

Sect. 2. All laws inconsistent with this act are hereby repealed.

Private and Special Laws of 1879, Chapter 173.

Section thirteen of chapter five hundred and thirty-two of the private and special laws of eighteen hundred and sixty-five, is hereby amended so as to read as follows:

Sect. 13. A reasonable charge shall be made for tuition, the amount of which shall be determined from time to time by the trustees; and the trustees and all persons employed by them shall constantly endeavor, by the adoption of judicious and effective arrangements in all the labor departments of the college, to reduce the cost of subsistence to the students, and to render the institution, as far as possible, self-sustaining.

Approved February 27, 1879.

"HATCH ACT" ESTABLISHING AGRICULTURAL EXPERIMENT STATIONS.

AN ACT to establish agricultural experiment stations in connection with the colleges established in the several states under the provisions of an act approved July second, eighteen hundred and sixty-two, and of the acts supplementary thereto.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That 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 applications of agricultural science, there shall be established, under direction of the college or colleges or agricultural department of colleges in each state or territory established, or which may hereafter be established, in accordance with the provisions of an act approved July second, eighteen hundred and sixty-two, entitled "An act donating public lands to the several states and territories which may provide colleges for the benefit of agriculture

and the mechanic arts," or any of the supplements to said act, a department to be known and designated as an "agricultural experiment station:" Provided, That in any State or Territory in which two such colleges have been or may be so established the appropriation hereinafter made to such State or Territory shall be equally divided between such colleges, unless the legislature of such State or Territory shall otherwise direct.

Sect. 2. That it shall be the object and duty of said experiment stations to conduct original researches or verify experiments on the physiology of plants and animals; the diseases to which they are severally subject, with the remedies for the same; the chemical composition of useful plants at their different stages of growth; the comparative advantages of rotative cropping as pursued under a varying series of crops; the capacity of new plants or trees for acclimation; the analysis of soils and water; the chemical composition of manures, natural or artificial, with experiments designed to test their comparative effects on crops of different kinds; the adaptation and value of grasses and forage plants; the composition and digestibility of the different kinds of food for domestic animals; the scientific and economic questions involved in the production of butter and cheese; and such other researches or experiments bearing directly on the agricultural industry of the United States as may in each case be deemed advisable, having due regard to the varying conditions and needs of the respective States or Territories.

Sect. 3. That in order to secure, as far as practicable, uniformity of methods and results in the work of said stations, it shall be the duty of the United States Commissioner of Agriculture to furnish forms, as far as practicable, for the tabulation of results of investigation or experiments; to indicate from time to time such lines of inquiry as to him shall seem most important; and, in general, to furnish such advice and assistance as will best promote the purpose of this act. It shall be the duty of each of said stations annually, on or before the first day of February, to make to the governor of the State or Territory in which it is located a full and detailed report of its operations, including a statement of receipts and expenditures, a copy of which report shall be sent to each of said stations, to the said Commissioner of Agriculture, and to the Secretary of the Treasury of the United States.

Sect. 4. That bulletins or reports of progress shall be published at said stations at least once in three months, one copy of which shall be sent to each newspaper in the States or Territories in which they are respectively located, and to such individuals actually engaged in farming as may request the same, and as far as the means of the station will permit. Such bulletins or reports and the annual reports of said stations shall be transmitted in the mails of the United States free of charge for postage, under such regulations as the Postmaster-General may from time to time prescribe.

Sect. 5. That for the purpose of paying the necessary expenses of conducting investigations and experiments and printing and dis-

tributing the results as hereinbefore prescribed, the sum of fifteen thousand dollars per annum is hereby appropriated to each State, to be specially provided for by Congress in the appropriations from year to year, and to each Territory entitled under the provisions of section eight of this act, out of any money in the treasury proceeding from the sales of public lands, to be paid in equal quarterly payments, on the first day of January, April, July, and October in each year, to the treasurer or other officer duly appointed by the governing boards of said colleges to receive the same, the first payment to be made on the first day of October, eighteen hundred and eighty-seven: Provided, however, That out of the first annual appropriation so received by any station an amount not exceeding one-fifth may be expended in the erection, enlargement, or repair of a building or buildings necessary for carrying on the work of such station; and thereafter an amount not exceeding five per centum of such annual appropriation may be so expended.

Sect. 6. That whenever it shall appear to the Secretary of the Treasury from the annual statement of receipts and expenditures of any of said stations that a portion of the preceding annual appropriation remains unexpended, such amount shall be deducted from the next succeeding annual appropriation to such station, in order that the amount of money appropriated to any station shall not exceed the amount actually and necessarily required for its maintenance and support.

Sect. 7. That nothing in this act shall be construed to impair or modify the legal relation existing between any of the said colleges and the government of the States or Territories in which they are respectively located.

Sect. 8. That in States having colleges entitled under this section to the benefits of this act and having also agricultural experiment stations established by law separate from said colleges, such States shall be authorized to apply such benefits to experiments at stations so established by such States; and in case any State shall have established under the provisions of said act of July second, aforesaid, an agricultural department or experimental station, in connection with any university, college, or institution not distinctively an agricultural college or school, and such State shall have established or shall hereafter establish a separate agricultural college or school, which shall have connected therewith an experimental farm or station, the legislature of such State may apply in whole or in part the appropriation by this act made to such separate agricultural college or school, and no legislature shall by contract express or implied disable itself from so doing.

Sect. 9. That the grants of moneys authorized by this act are made subject to the legislative assent of the several States and Territories to the purposes of said grants: Provided, That payment of such installments of the appropriation herein made as shall become due to any State before the adjournment of the regular session of its legislature meeting next after the passage of this act shall be made

upon the assent of the governor thereof duly certified to the Secretary of the Treasury.

Sect. 10. Nothing in this act shall be held or construed as binding the United States to continue any payments from the Treasury to any or all the States or institutions mentioned in this act, but Congress may at any time amend, suspend, or repeal any or all the provisions of this act.

Approved, March 2, 1887.

"MORRILL ACT" FOR THE FURTHER ENDOWMENT OF THE COLLEGES.

AN ACT to apply a portion of the proceeds of the public lands to the more complete endowment and support of the colleges for the benefit of agriculture and the mechanic arts established under the provisions of an act of Congress approved July second, eighteen hundred and sixty-two.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That there shall be, and hereby is, annually appropriated, out of any money in the Treasury not otherwise appropriated, arising from the sales of public lands, to be paid as hereinafter provided to each State and Territory for the more complete endowment and maintenance of colleges for the benefit of agriculture and the mechanic arts now established, or which may be hereafter established, in accordance with an act of Congress approved July second, eighteen hundred and sixty-two, the sum of fifteen thousand dollars for the year ending June thirtieth, eighteen hundred and ninety, and an annual increase of the amount of such appropriation thereafter for ten years by an additional sum of one thousand dollars over the preceding year, and the annual amount to be paid thereafter to each State and Territory shall be twenty-five thousand dollars, to be applied only to instruction in agriculture, the mechanic arts, the English language, and the various branches of mathematical, physical, natural, and economic science, with special reference to their applications in the industries of life, and to the facilities for such instruction: Provided, That no money shall be paid out under this act to any State or Territory for the support and maintenance of a college where a distinction of race or color is made in the admission of students, but the establishment and maintenance of such colleges separately for white and colored students shall be held to be a compliance with the provisions of this act if the funds received in such State or Territory be equitably divided as hereinafter set forth: Provided, That in any State in which there has been on college established in pursuance of the act of July second, eighteen hundred and sixty-two, and also in which an educational institution of like character has been established, or

may be hereafter established, and is now aided by such State from its own revenue, for the education of colored students in agriculture and the mechanic arts, however named or styled, or whether or not it has received money heretofore under the act to which this act is an amendment, the legislature of such State may propose and report to the Secretary of the Interior a just and equitable division of the fund to be received under this act between one college for white students and one institution for colored students established as aforesaid, which shall be divided into two parts and paid accordingly, and thereupon such institution for colored students shall be entitled to the benefits of this act and subject to its provisions, as much as it would have been if it had been included under the act of eighteen hundred and sixty-two, and the fulfillment of the foregoing provisions shall be taken as a compliance with the provision in reference to separate colleges for white and colored students.

Sect. 2. That the sums hereby appropriated to the States and Territories for the further endowment and support of colleges shall be annually paid on or before the thirty-first day of July of each year, by the Secretary of the Treasury, upon the warrant of the Secretary of the Interior, out of the Treasury of the United States, to the State or Territorial treasurer, or to such officer as shall be designated by the laws of such State or Territory to receive the same, who shall, upon the order of the trustees of the college, or the institution for colored students, immediately pay over said sums to the treasurers of the respective colleges or other institutions entitled to receive the same, and such treasurers shall be required to report to the Secretary of Agriculture and to the Secretary of the Interior, on or before the first day of September of each year, a detailed statement of the amount so received and of its disbursement. The grants of moneys authorized by this act are made subject to the legislative assent of the several States and Territories to the purpose of said grants: Provided, That payments of such installments of the appropriation herein made as shall become due to any State before the adjournment of the regular session of legislature meeting next after the passage of this act shall be made upon the assent of the governor thereof, duly certified to the Secretary of the Treasury.

Sect. 3. That if any portion of the moneys received by the designated officer of the State or Territory for the further and more complete endowment, support, and maintenance of colleges, or of institutions for colored students, as provided in this act, shall, by any action or contingency, be diminished or lost, or be misapplied, it shall be replaced by the State or Territory to which it belongs, and until so replaced no subsequent appropriation shall be apportioned or paid to such State or Territory; and no portion of said moneys shall be applied, directly or indirectly, under any pretense whatever, to the purchase, erection, preservation, or repair of any building or buildings. An annual report by the president of each of said

colleges shall be made to the Secretary of Agriculture, as well as to the Secretary of the Interior, regarding the condition and progress of each college, including statistical information in relation to its receipts and expenditures, its library, the number of its students and professors, and also as to any improvements and experiments made under the direction of any experiment stations attached to said colleges, with their costs and results, and such other industrial and economical statistics as may be regarded as useful, one copy of which shall be transmitted by mail free to all other colleges further endowed under this act.

Sect. 4. That on or before the first day of July in each year, after the passage of this act, the Secretary of the Interior shall ascertain and certify to the Secretary of the Treasury as to each State and Territory whether it is entitled to receive its share of the annual appropriation for colleges, or of institutions for colored students, under this act, and the amount which thereupon each is entitled, respectively, to receive. If the Secretary of the Interior shall withhold a certificate from any State or Territory of its appropriation the facts and reasons therefor shall be reported to the President, and the amount involved shall be kept separate in the Treasury until the close of the next Congress, in order that the State or Territory may, if it should so desire, appeal to Congress from the determination of the Secretary of the Interior. If the next Congress shall not direct such sum to be paid it shall be covered into the treasury. And the Secretary of the Interior is hereby charged with the proper administration of this law.

Sect. 5. That the Secretary of the Interior shall annually report to Congress the disbursements which have been made in all the States and Territories, and also whether the appropriation of any State or Territory has been withheld, and if so, the reasons therefor.

Sect. 6. Congress may at any time amend, suspend, or repeal any or all of the provisions of this act.

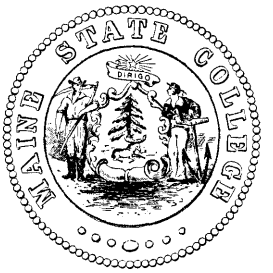
Approved, August 30, 1890.

VIEW FROM THE CAMPUS.

CATALOGUE

OF THE

Maine State College



1896-1897

ORONO, MAINE

AUGUSTA
Kennebec Journal Print
1897

TABLE OF CONTENTS.

CALENDAR.

FALL TERM, 1896.

August	31, Monday,	Before-term examinations begin.
September	1, Tuesday,	Entrance examinations begin.
September	2, Wednesday,	Fall term begins.
November	20, Friday,	Senior debate.
November	24, Tuesday,	Meeting of the Board of Trustees.
November	26, Thursday,	Thanksgiving recess.
November	29, Sunday,	
December	4, Friday,	Sophomore prize declamation.
December	22, Tuesday,	Term examinations begin.
December	24, Thursday,	Term ends.

SPRING TERM, 1897.

February	1, Monday,	Before-term examinations begin.
February	2, Tuesday,	Entrance examinations begin.
February	3, Wednesday,	Spring term begins.
February	22, Monday,	Washington's birthday.
May	14, Friday,	Ivy day.
May	31, Monday,	Decoration day.
June	5, Saturday,	Senior vacation begins.
June	9, Wednesday,	Farmers' field day.
June	19, Saturday,	Junior exhibition.
June	20, Sunday,	Baccalaureate sermon.

June	21, Monday,	Convocation.
June	21, Monday,	Class day.
June	22, Tuesday,	Meeting of the Board of Trustees.
June	22, Tuesday,	Exhibition drill.
June	22, Tuesday,	Reception by the fraternities.
June	22, Tuesday,	Reception by the President.
June	23, Wednesday,	Commencement.
June	23, Wednesday,	Commencement dinner.
June	23, Wednesday,	Meeting of the Alumni Association.
June	23, Wednesday,	Commencement concert.
June	24, Thursday,	Entrance examinations begin.

FALL TERM, 1897.

August	30, Monday,	Before-term examinations begin.
August	31, Tuesday,	Entrance examinations begin.
September	1, Wednesday,	Fall term begins.
November	19, Friday,	Senior debate.
November	23, Tuesday,	Meeting of the Board of Trustees.
November	25, Thursday,	Thanksgiving recess.
November	28, Sunday,	
December	3, Friday,	Sophomore prize declamation.
December	21, Tuesday,	Term examinations begin.
December	23, Thursday,	Term ends.

SPRING TERM, 1898.

January	31, Monday,	Before-term examinations begin.
February	1, Tuesday,	Entrance examinations begin.
February	2, Wednesday,	Spring term begins.
June	22, Wednesday,	Commencement.

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 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 principal or interest of this fund, for the purchase, erection, or maintenance of buildings; and the several States claiming and taking the benefit of the provisions of the Act were required, "to provide within five years not less than one college" to carry out the purposes of the Act.

The State accepted this grant in 1863, and in 1865 constituted Samuel F. Perley, Hannibal Hamlin, and fourteen other persons "a body politic and corporate, by the name of the Trustees of the State College of Agriculture and the Mechanic Arts." The Trustees were authorized to receive and hold donations, 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, and to exercise other usual powers and privileges.

The Governor and Council were given the right, "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 in addition to the studies especially mentioned in the Act of Congress, the college should teach such other studies as the facilities would permit. Military instruction was explicitly ordered. Tuition was made free.

ENDOWMENT AND INCOME.

The State of Maine received, under the Act of Congress, two hundred and ten thousand acres of public land, from which the college has realized an endowment fund of about $118,300. To this have 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 Oldtown $3,000, for the purchase of the site on which the college buildings stand. The State has appropriated about $300,000, 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, 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, $15,000 for the year ending June 30, 1890. 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 college receives, during 1895 and 1896, $20,000 annually from the State for current expenses.

THE BOARD OF TRUSTEES.

HON. HENRY LORD, *President*,	Bangor.
HON. WILLIAM THOMAS HAINES, B. S., LL. B., *Secretary*,	Waterville.
HON. BENJAMIN FRANKLIN BRIGGS,	Auburn.
GREENVILLE JEFFERSON SHAW,	Hartland.
HON. RUSSELL BENJAMIN SHEPHERD,	Skowhegan.
ARTHUR LEE MOORE, B. S.,	Orono.
HON. ELLIOTT WOOD,	Winthrop.
HON. CHARLES PLUMMER ALLEN, B. S.,	Presque Isle.

EXECUTIVE COMMITTEE.

TRUSTEES LORD, HAINES, AND ALLEN.

TREASURER.

HON. ISAIAH KIDDER STETSON, B. PH., Bangor.

THE EXPERIMENT STATION COUNCIL.

BENJAMIN FRANKLIN BRIGGS, ... Auburn.

ARTHUR LEE MOORE, B. S., ... Orono.

ELLIOTT WOOD, ... Winthrop.
Committee of the Board of Trustees.

ABRAM WINEGARDNER HARRIS, Sc. D., *President*, Orono.
President of the College.

CHARLES DAYTON WOODS, B. S., *Secretary*, ... Orono.
Director of the Station.

BENJAMIN WALKER McKEEN, ... Fryeburg.
Representative of the State Board of Agriculture.

ORA OTIS CROSBY, ... Albion.
Representative of the Maine State Grange.

CHARLES S. POPE,
Representative of the State Pomological Society.

JAMES MONROE BARTLETT, M. S., ... Orono.

LUCIUS HERBERT MERRILL, B. S., ... Orono.

FRANCIS LEROY HARVEY, Ph. D., ... Orono.

FREMONT LINCOLN RUSSELL, V. S., ... Orono.

WELTON MARKS MUNSON, M. S., ... Orono.
Members of the Station Staff.

THE FACULTY AND OTHER OFFICERS.

ABRAM WINEGARDNER HARRIS, Sc. D.,.....Campus.
President.

MERRITT CALDWELL FERNALD, Ph. D.,.....Bennoch Street.
Emeritus Professor of Mathematics.

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

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

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

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

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

LUCIUS HERBERT MERRILL, B. S.,.....Forest Avenue.
Chemist in the Experiment Station.

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

JAMES NORRIS HART, C. E.,.....Campus.
Professor of Mathematics and Astronomy.

WELTON MARKS MUNSON, M. S.,.....Campus.
Professor of Horticulture, and Horticulturist of the Experiment Station.

HORACE MELVYN ESTABROOKE, M. S., M. A.,.....Main Street.
Professor of English.

JAMES STACY STEVENS, Ph. D.,.....Main Street.
Professor of Physics.

GILBERT MOTTIER GOWELL, M. S.,.....Campus.
Professor of Animal Industry, and Agriculturist of the Experiment Station.

CHARLES DAYTON WOODS, B. S.,.....Main Street.
Professor of Agriculture, and Director of the Experiment Station.

HERBERT NATHAN ROYDEN, U. S. A.,.....Middle Street.
Professor of Military Science.

NATHAN CLIFFORD GROVER, B. C. E.,.....Campus.
Assistant Professor of Civil Engineering.

HOWARD SCOTT WEBB, M. E.,. .....North Main Street.
Instructor in Mechanical Engineering.

FREEMONT LINCOLN RUSSELL, V. S.,.....College Street.
Instructor in Biology, and Veterinarian in the Experiment Station.

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

WILBUR FISK JACKMAN, B. S., Ph. C.,.....North Main Street.
Instructor in Pharmacy.

BURTON SMITH LANPHEAR, M. E.,.....College Street.
Instructor in Electrical Engineering.

EDWIN BRYANT NICHOLS, B. A.,.....Bennoch Street.
Instructor in Modern Languages.

GUY ASHTON ANDREWS, B. A.,.....Main Street.
Instructor in German and Latin.

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

IRVING WETHERBEE FAY, B. A., Ph. D.,.....Main Street.
Instructor in Biological Chemistry, and Chemist in the Experiment Station.

HALBERT GARDINER ROBINSON, B. C. E.,.....Mill Street.
Tutor in Mathematics.

HAROLD SHERBURNE BOARDMAN, B. C. E.,.....Bangor
Tutor in Drawing.

PERLEY WALKER, B. M. E.,.....Peters Street.
Tutor in Shop-work and Mathematics.

CHARLES PARTRIDGE WESTON, B. C. E.,.....Campus.
Tutor in Physics.

HARVEY WATERMAN THAYER, B. A.,.....Campus.
Tutor in French and English.

LUCIUS JERRY SHEPARD, B. S.,.....Campus.
Assistant Horticulturist in the Experiment Station.

HENRY BENNETT SLADE, B. A.,.....Main Street.
Assistant Chemist in the Experiment Station.

ORA WILLIS KNIGHT, B. S.,.....Bangor.
Assistant in Natural Science.

ELIZABETH ABBOTT BALENTINE,.....Campus.
Secretary to the President, and Secretary of the Faculty.

ALICE POTTLE, ...Bangor.
Cashier and Stenographer.

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 college bills. A cash deposit covering the bills of one term will be accepted in place of a bond. No distinction is made in regard to sex or place of residence. Candidates for advanced standing, are examined in the preparatory studies and in those previously pursued by the classes they propose to enter, or other equivalent studies. Certificates will be accepted for the preparatory work, but not for any part of the college work, unless done in some other college.

A student who has accomplished half or more of the preparatory course may be examined on that part, and receive credit therefor.

The required work of the college includes an unusually large amount of mathematics, and success in the engineering courses requires the ability to make easy use of the higher mathematics. It is therefore desirable that students preparing for admission to the college be subjected to the most rigorous drill in this subject. Fitting schools should give a part of the work in geometry and algebra, or a review of these subjects, during the last year.

The preparation in English 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, not candidates for a degree, 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 the summer school.

College graduates who wish to enter a technical course, will be admitted to the junior class without examination. Students in classical or literary courses, who expect to pursue technical courses after graduation, should avail themselves of all opportunities for the study of mathematics, physics, chemistry, and drawing, as a preparation for engineering courses; and of physics, chemistry, and drawing, for chemical, and biological courses.

ENTRANCE EXAMINATIONS.

Examinations are held at the college, beginning on the day before the opening of each term, and on the day after commencement. Examinations will be held, if desired, in each county of the State. The examinations in other places 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, examination papers will be sent to any satisfactory person who will consent to conduct an 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 candidate must secure the consent of the person to take charge of the examination, and make early request of the President of the college to have papers sent.

Candidates for the CHEMICAL, AGRICULTURAL (four years), PREPARATORY MEDICAL, PHARMACY (four years), CIVIL ENGINEERING, MECHANICAL ENGINEERING, and ELECTRICAL ENGINEERING COURSES are examined on—*Elementary Subjects*, Arithmetic, English Grammar, Physiology; *Language*, English; *History*, United States; *Mathematics*, Geometry, Algebra; *Science*,

Two of the following,—Botany, Chemistry, Physical Geography, Physics.

Candidates for the LATIN-SCIENTIFIC COURSE are examined on —*Elementary Subjects*, Arithmetic, English Grammar, Physiology; *Language*, English, Latin, and either French or German; *History*, United States, Roman; *Mathematics*, Geometry, Algebra.

Candidates for the SCIENTIFIC COURSE are examined on—*Elementary Subjects*, Arithmetic, English Grammar, Physiology; *Language*, English, and either French or German; *History*, United States, and one of the following,—General, Roman, English; *Mathematics*, Geometry, Algebra; *Science*, Two of the following,—Botany, Chemistry, Physical Geography, Physics.

Candidates for the SHORT COURSES IN AGRICULTURE (one and two years), are examined on—*Elementary Subjects*, Arithmetic, English Grammar, Physiology; *Language*, English; *History*, United States; *Mathematics*, Algebra through simple equations of the first degree; *Science*, One of the following,—Botany, Chemistry, Physical Geography, Physics.

Candidates for the SHORT COURSE IN PHARMACY (two years) are examined on—*Elementary Subject*, Descriptive Geography, Arithmetic, English Grammar, Ph siology; *History*, United States; *Mathematics*, Algebra through simple equations of the first degree.

SUBSTITUTES.—The requirements for the Latin-Scientific Course will be accepted for any other course. One year of Latin will be accepted as a substitute for one of the following groups: (a) Arithmetic, English Grammar and Physiology; (b) French or German; (c) One science.

French or German will be accepted as a substitute for one of the following groups: (a) Arithmetic, English Grammar, Physiology; (b) One science.

Other real substitutes will be accepted for any part of the requirements except Mathematics, English, and Latin.

ADDITIONAL REQUIREMENTS.—In 1898 the requirements for the engineering courses will be increased by Solid Geometry. In 1899 the requirements for The Chemical, Agricultural (4 years), Preparatory Medical, Pharmacy (4 years), and Engineering Courses will include one foreign language, either ancient or modern, as the candidate may prefer.

ENTRANCE REQUIREMENTS FOR ALL COURSES.

THE STARS INDICATE THE STUDIES REQUIRED.

Studies.	General Courses.		Technical Scientific Courses.				Engineering Courses.			Short Courses.		
	Latin-Scientific.	Scientific.	Chemical.	Agricultural.	Prep. Medical.	Pharmacy.	Civil Engin.	Mech. Engin.	Elect. Engin.	Pharmacy, 2 yrs.	Agricult., 2 yrs.	Agricult., 1 yr.
Elementary: a												
Geography										*		
Arithmetic	*	*	*	*	*	*	*	*	*	*	*	*
Eng. Gram	*	*	*	*	*	*	*	*	*	*	*	*
Physiology	*	*	*	*	*	*	*	*	*	*	*	*
Language: b												
English	*	*	*	*	*	*	*	*	*		*	*
French	*c	*c										
German												
Latin	*											
History:												
United States	*	*	*	*	*	*	*	*	*	*	*	*
General		*d										
Roman	*											
English												
Mathematics: e												
Plane Geometry	*	*	*	*	*	*	*	*	*			
Algebra	*	*	*	*	*	*	*	*	*	*f	*f	*f
Science: a												
Botany												
Chemistry		*g	*g	*g	*g	*g	*g	*g	*g		*g	*g
Phys. Geog.		*	*	*	*	*	*	*	*		*	*
Physics												

a—One year of Latin, or of a modern language will be accepted as a substitute for all the elementary studies, or for one science.

b—In 1899, one foreign language, either ancient or modern as the candidate may prefer, will be required for the technical scientific, and the engineering courses.

c—Either French or German; one year of Latin will be accepted as a substitute.

d—General, or Roman, or English History in addition to United States History.

e—In 1898 solid geometry will be required for engineering courses.

f—Through simple equations of the first degree only.

g—Two sciences, from the list of four, are required.

ENTRANCE REQUIREMENTS.

The following statements will show in detail, the requirements in each subject.

Elementary Subjects.

Descriptive 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. Required for short course in pharmacy only.

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. A thorough drill in mental arithmetic with a book like Colburn's is recommended.

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. Attention should be given to punctuation and use of capital letters.

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

Language.

English.—I. *Reading and Practice.* Each candidate will be required to present evidence of a general knowledge of the substance of the books mentioned below and to answer simple questions on the lives of their authors. The examination will usually be the writing of one or two paragraphs on each of several topics. The treatment of these topics is designed to test the power of clear and accurate expression, and will call for only a general knowledge of the substance of the books. In

place of this test, the candidate may present an exercise book, certified by his instructor, containing compositions or other written work done in connection with the reading of the books.

In 1897, this part of the examination will be based upon: Shakspere's As You Like It, Defoe's History of the Plague in London, Irving's Tales of a Traveller, Hawthorne's Twice Told Tales, Longfellow's Evangeline, George Eliot's Silas Marner.

In 1898, it will be based upon: Milton's Paradise Lost, books I and II, Pope's Iliad, books I and XXII, the Sir Roger de Coverley Papers in the Spectator, Goldsmith's Vicar of Wakefield, Coleridge's Ancient Mariner, Southey's Life of Nelson, Carlyle's Essay on Burns, Lowell's Vision of Sir Launfal, Hawthorne's House of the Seven Gables.

II. *Study and Practice.* This part of the examination presupposes a careful study of the works named below. The examination will be upon subject-matter, form, and structure; and will also test the candidate's ability to express his knowledge with clearness and accuracy.

In 1897, this part of the examination will be based upon: Shakspere's Merchant of Venice, Burke's Speech on Conciliation with America, Scott's Marmion, Macaulay's Life of Samuel Johnson.

In 1898, it will be based upon Shakspere's Macbeth, Burke's Speech on Conciliation with America, DeQuincey's Flight of a Tartar Tribe, Tennyson's Princess.

FRENCH.—The candidate offering French, should have: an accurate knowledge of the grammar, and especially of the regular and irregular verbs; an elementary knowledge of French composition; the ability to read at sight French novels of average difficulty.

GERMAN.—The candidate offering German should have: an accurate knowledge of the essentials of the grammar; an elementary knowledge of German composition; the ability to read a classical play, with fair ease.

LATIN.—The grammar, including prosody; Cæsar's Gallic War, books I, II, III, and IV; Cicero's four orations against Cataline, and those for Archias and for the Manilian Law; Virgil's Eclogues and the Æneid, books I, II, III, IV, V, VI; the sight translation of Latin passages of average difficulty; transla-

tion into Latin of simple English sentences, and easy narrative passages based on the prose authors read. For the last, a vocabulary of unusual words will be furnished. Equivalent readings will be accepted for those prescribed.

History.

United States History.—An elementary knowledge such as may be obtained from Higginson's History of the United States.

General History.—Myer's General History.

Roman History.—Allen's Short History of the Roman People, to the death of Marcus Aurelius.

English History.—An elementary knowledge such as may be obtained from Montgomery's History of England.

Mathematics.

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

Algebra.—The elements, equations of the first degree, radicals, quadratic equations, arithmetical and geometrical progression.

Candidates for the short courses in agriculture and the short course in pharmacy are not examined on the topics beyond simple equations of the first degree. A satisfactory preparation may be obtained from Greenleaf's Elementary, Newcomb's, Wells' Academic or Wentworth's School, Algebra.

Science.

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.

CHEMISTRY.—The necessary ground is covered by the following text-books: Fisher, Remsen, Roscoe (inorganic part), Shepard, Storer and Lindsay, Williams.

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.

PHYSICS.—A satisfactory treatment of this subject may be found in Avery's or Gage's Physics.

CERTIFICATES OF FITNESS.

Any preparatory school whose course of instruction covers in a satisfactory manner the requirements for admission to the college, may be admitted to its list of approved schools. Application for such approval should be made to the President of the college, and must be accompanied by a detailed statement of the course of study.

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.

APPROVED SCHOOLS.

Athol High School, *Athol*, *Mass.*,
F. C. Avery, Principal.

Bangor High School, *Bangor*,
Henry K. White, M. A., Principal.

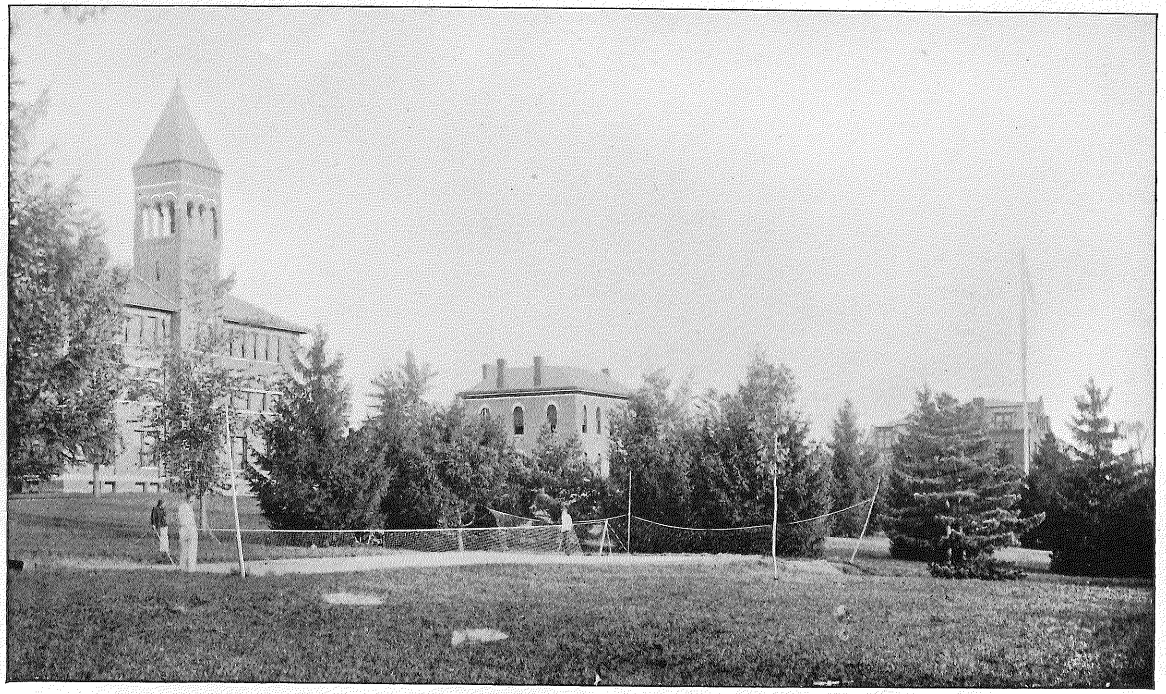
Bar Harbor High School, *Bar Harbor*,
Prescott Keyes, Jr., B. C. E., Principal.

Bath High School, *Bath*,
H. E. Cole, M. A., Principal.

Belfast High School, *Belfast*,
Reuben L. Ilsley, M. A., Principal.
Berwick Academy, *South Berwick*,
Edward D. Merriman, B. A., Principal.
Boynton High School, *Eastport*,
J. B. Warren, M. A., Principal.
Brewer High School, *Brewer*,
Elmer T. Boyd, Principal.
Bridge Academy, *Dresden Mills*,
Alonzo A. Morelen, Principal.
Bridgton Academy, *North Bridgton*,
C. C. Spratt, B. A., Principal.
Caribou High School, *Caribou*,
William C. Hill, Principal.
Cherryfield Academy, *Cherryfield*,
Leroy S. Dewey, B. A., Principal.
Coburn Classical Institute, *Waterville*,
Franklin W. Johnson, M. A., Principal.
Cony High School, *Augusta*,
Albion Hale Brainard, M. A., Principal.
Corinth Academy, *East Corinth*,
John B. Merrill, Principal.
Deering High School, *Deering*,
Edgar H. Crosby, M. A., Principal.
Dexter High School, *Dexter*,
W. S. Brown, Principal.
Dover English High School, *Dover*,
W. J. Rideout, Principal.
East Maine Conference Seminary, *Bucksport*,
Rev. A. F. Chase, Ph. D., President.
Edward Little High School, *Auburn*,
J. F. Moody, M. A., Principal.
Ellsworth High School, *Ellsworth*,
H. A. Moore, Principal.
English High School, *Boston, Mass.*,
Robert E. Babson, Principal.
Farmington High School, *Farmington*,
Charles M. Pennell, Principal.

Fort Fairfield High School, *Fort Fairfield*,
H. F. Kalloch, B. A., Principal.
Foxcroft Academy, *Foxcroft*,
W. R. Fletcher, B. A., Principal.
Framingham Academy and High School, *Framingham*, *Mass.*,
John H. Parsons, M. A., Principal.
Gardiner High School, *Gardiner*,
William L. Powers, M. A., Principal.
Greeley Institute, *Cumberland Center*,
Edgar L. Pennell, B. A., Principal.
Guilford High School, *Guilford*,
Leland A. Ross, B. A., Principal.
Hallowell High School, *Hallowell*,
George W. Singer, Principal.
Hampden Academy, *Hampden*,
George C. Webber, Principal.
Higgins Classical Institute, *Charleston*,
Henry W. Foss, B. A., Principal.
Lewiston High School, *Lewiston*,
G. H. Libby, Principal.
Limington Academy, *Limington*,
Herbert L. Whitman, B. A., Principal.
Lincoln Academy, *Newcastle*,
G. H. Larrabee, M. A., Principal.
Lisbon High School, *Lisbon*,
Charles P. Barnes, Principal.
Machias High School, *Machias*,
D. L. Fisher, M. A., Principal.
Madison High School, *Madison*,
Fred L. Tapley, Principal.
Maine Wesleyan Seminary, *Kent's Hill*,
Rev. G. W. Gallagher, D. D., President.
Milo High School, *Milo*,
Charles E. Perkins, Principal.
Monson Academy, *Monson*,
Harry W. Dunn, B. A., Principal.
North Yarmouth Academy, *Yarmouth*,
Rev. B. P. Snow, M. A., Principal.

Norway High School, *Norway*,
A. G. Wiley, B. A., Principal.
Oldtown High School, *Oldtown*,
Harry Thornton Watkins, B. A., Principal.
Orono High School, *Orono*,
S. H. Powell, M. A., Principal.
Parsonsfield Seminary and Piper High School, *N. Parsonsfield*,
Isaiah Trufant, M. A., Principal.
Patten Academy, *Patten*,
William L. Bonney, B. A., Principal.
Pennell Institute, *Gray*,
W. B. Andrews, M. A., Principal.
Phillips High School, *Phillips*.
Warren W. Austin, Principal.
Portland High School, *Portland*,
Albro E. Chase, Principal.
Ricker Classical Institute, *Houlton*,
Arthur M. Thomas, M. A., Principal.
Rockland High School, *Rockland*,
L. E. Moulton, Principal.
Skowhegan High School, *Skowhegan*,
W. N. Donovan, M. A., Principal.
South Paris High School, *South Paris*,
F. T. Wingate, B. A., Principal.
South Portland High School, *South Portland*,
Ralph A. Parker, Principal.
Thomaston High School, *Thomaston*,
Percy Bartlett, Principal.
Thornton Academy, *Saco*,
Edwin P. Sampson, M. A., Principal.
Topsham High School, *Topsham*,
John A. Cone, Principal.
Waterville High School, *Waterville*,
Austin H. Evans, Principal.
Washington Academy, *East Machias*,
F. O. Small, B. A., Principal.
Westbrook High School, *Westbrook*,
F. W. Freeman, M. A., Principal.
Westbrook Seminary, *Deering*,
Rev. H. S. Whitman, M. A., President.
Yarmouth High School, *Yarmouthville*.
H. M. Moore, B. A., Principal.



BUILDINGS FOR ENGINEERY, CHEMISTRY AND NATURAL, SCIENCE.

THE BUILDINGS AND THEIR EQUIPMENT.

WINGATE HALL.—The most conspicuous building on the campus, Wingate Hall, named in honor of William P. Wingate of Bangor, long an honored member of the board of trustees, is a three-story brick structure rectangular in form, with a handsome tower furnished with a clock. It was erected 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 for the professors of civil and mechanical engineering. On the second floor is a handsome room occupied by the Young Men's Christian Association, the offices and recitation rooms of the professor of mathematics and the professor of physics, the physical laboratory, and the apparatus room. On the third floor are large drawing rooms, well lighted, and said to be the best of their kind in New England. In the basement are the testing room of the department of civil engineering, and the laboratory for electrical measurements and optics. The testing room contains a Riehlé testing machine of 60,000 pounds capacity, cement testing machine, etc. The testing machines are driven by the engine used for forcing air through the building. The electrical laboratory contains a dark room, solid stone tables, and working accommodations for twenty students.

OAK HALL.—North of Wingate Hall is Oak Hall, a substantial four-story brick building used as a dormitory, named in honor of Lyndon Oak of Garland, for many years a useful member of the board of trustees. It contains forty-nine rooms for students,

bath rooms, and reading room, is heated by steam, supplied with water, and lighted by electricity. It was remodeled and re-finished in 1895.

FERNALD HALL.—This building, named in honor of Merritt C. Fernald, Ph. D., president of the college from 1879 to 1893, is a two-story brick building, situated south of Wingate Hall. It contains twenty rooms devoted to the needs of the department of chemistry. On the first floor are the quantitative and pharmaceutical laboratories, supplied with fume closets, water, gas, air blasts, drying closets, steam cups, and filter pumps; the balance room supplied with assay and analytical balances; two stock rooms containing all necessary apparatus; offices and private laboratories for the professor of chemistry, and the instructor in pharmacy. On the second floor are the lecture room, the qualitative laboratory, supplied with fume closets, water, gas, and air blast; the office and private laboratory of the instructor in qualitative analysis, a store room, and recitation room. This room serves as the laboratory of mineralogy, and is thoroughly equipped with the apparatus necessary for the determination of minerals. Under the roof are arranged the photographic studio, laboratory, and dark rooms. In the basement is an assay laboratory supplied with large and small furnaces, a crusher, grinding plate, etc.; the laboratory for beginners; and two store rooms.

The department of chemistry is well supplied with special apparatus such as spectroscopes of direct vision and other forms, two Reichert's microscopes with sets of objectives, polariscope, Westphal's specific gravity balance, apparatus for the bacteriological examination of water, apparatus for gas analysis, and lecture apparatus for illustrative purposes. The greater part of the chemical library, including the current and bound volumes of journals, is kept in this building.

COBURN HALL.—Directly south of Fernald Hall is Coburn Hall, named in honor of Abner Coburn of Skowhegan, the chief benefactor of the college. It is a brick building, three stories in height. On the first floor are located the laboratory and recitation room of the professor of agriculture, the recitation room of the professor of English, the reading room, and the library. The

latter is a well lighted room about forty feet square, fitted up with the best modern library furniture. About 10,000 volumes, exclusive of pamphlets, are on its shelves, and the number of books is rapidly increasing. On the walls are portraits of Governor Coburn, President Allen, and President Fernald. On the second floor are the botanical and entomological laboratories, and recitation rooms for the departments of natural history, civics, and modern languages. Directly over the library is the museum, 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 three hundred and fifty persons. In the basement is the college office.

THE MACHINE SHOP.—In the rear of Fernald Hall is the machine shop, a wooden building 125 feet long, and two stories high, containing a foundry, forge shop, carpenter shop, machine shop, and tool room. The shop is thoroughly equipped with one 18-inch cupola furnace, ladles, slickers, trowels, rammers, shovels, bellows, etc., power blast forges, anvils, tongs and cutters, heading tools, blower, exhaust fan, sledges, etc., engine lathes, planers, shaper, milling machine, drills, double head emery grinder, taps, dies, reamers, mandrels, drills, milling cutters, wrenches, chucks, and lathe dogs, benches and vises, saw benches with attachments, jig saw, planers, lathes, tool grinder, carpenter's tools, work benches, vises, and cases for tools. Power for running the machinery is furnished by a 60-horse-power steam engine. Adjoining the shop is a one-story building, 30 by 57 feet, containing the dynamos, motors, and storage battery, which operate the college lighting plant, and serve the seniors for study in their technical work in electrical engineering.

THE EXPERIMENT STATION BUILDING.—South of the Machine Shop stands a substantial two-story brick building with basement which is devoted to the uses of the Agricultural Experiment Station. In the basement are rooms for the storage and preparation of samples for analysis, a food laboratory, and the boiler room. On the ground floor are the journal room, re-agent room, the laboratory used in the analysis of foods and feeding stuffs, nitrogen room, and the laboratory used in the analysis of fertilizers. On the second floor are the general offices, the director's

private office, the bacteriological laboratory, and a storage room for books and pamphlets. The building is heated by steam, lighted by gas, and thoroughly equipped with apparatus.

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, a seed storage room, a photographing room, the janitor'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 structure, 20 feet by 80 feet, running parallel to the main greenhouse, is divided, one-half being used for growing plants, and the remainder as a potting and storage 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, a cold storage room, a cheese curing room, a lecture room, the office of the professor of animal industry, and a laboratory. It is supplied with a Sharpless cream separator, a United States separator, a De Laval hand cream separator, creamers, churns, butter workers, cream and cheese tempering vats, weighing tanks, Babcock testers, and other appliances necessary for teaching the most approved methods of handling milk, cream, butter, and cheese. The building is heated with steam and supplied with hot and cold water. Power is furnished by a 6-horse power engine, and by a baby tread horse power.

OTHER BUILDINGS.—In addition to the buildings already described, there are nine others devoted to various college purposes. Among these are the President's house, three fraternity club houses, a chapter house, and three residences occupied by members of the faculty.

DEPARTMENTS OF INSTRUCTION.

A—ENGLISH.

PROFESSOR ESTABROOKE.

A 1. RHETORIC.—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.; fortnightly exercises in extemporaneous speaking; frequent exercises in extemporaneous writing; formal essays.

The text-book is Genung's Outlines of Rhetoric. *Five hours a fortnight for sixteen weeks.*

A 2. RHETORIC. Extended study of narration and description, argumentative composition, and persuasion; construction of analytical outlines of selections from Burke, Webster, Macaulay, and others; practice in different kinds of composition; exercises in extemporaneous speaking and writing as in course 1.

The text-book is A. S. Hill's Principles of Rhetoric. *Five hours a fortnight for twenty weeks.*

A 3. ANGLO-SAXON.—Elements of Anglo-Saxon grammar; reading of easy prose and poetry. Constant reference is made to the relation of Anglo-Saxon to modern English.

The text-book is Cook's Grammar. *Five hours a fortnight for twenty weeks.*

A 4. ENGLISH LITERATURE. — The text-book is Painter's Introduction to English Literature, which is supplemented by frequent lectures. Some of the masterpieces of our language, together with the historical and social conditions under which they were produced, are studied in detail. The student prepares frequent essays upon the times and characters studied, makes analyses of the books, and writes critical reviews of the same. The work of the classroom is supplemented by study in the library.

Five hours a week for sixteen weeks.

A 5. DECLAMATIONS.—During the freshman and sophomore years the student is required to give ten declamations before his class each year—four in the fall and six in the spring. During the junior year he is required to give two declamations in the fall and three in the spring. In the senior year he takes part in a public debate.

A 6. THEMES.—During his sophomore year the student writes five themes, each containing from 1,200 to 1,500 words. The themes are historical in character—the results of the student's reading on special epochs of history, or of his study of the lives of historic men. In his junior year he prepares the same number of themes, each containing from 1,500 to 2,000 words. He also submits a theme for a prize at the close of the year. In the senior year, he writes themes, prepares orations, or takes part in debates.

A 7. EUROPEAN LITERATURE.—An outline of the best literature of the principal European nations, since the revival of learning. The class-room work is supplemented by reading.

Five hours a week for twenty weeks. MISS FERNALD.

B—MODERN LANGUAGES.

MR. NICHOLS; MR. ANDREWS; MR. THAYER.

B 1. FRENCH.—The object of this course is to enable the student to acquire the essentials of the grammar, and the ability to read moderately easy novels.

The text-books are: Grandgent, Short French Grammar; Verne, L'Expedition de la Jeune-Hardie; Erckmann-Chatrian,

Le Conscrit de 1813; Molière, L'Avare; De Musset, Pierre et Camille. *Five hours a week for sixteen weeks.* MR. NICHOLS; MR. THAYER.

B 2. FRENCH.—This course is for the study of advanced grammar and composition in connection with considerable reading of French.

The text-books are: Merimée, Colomba; Balzac, Le Curé de Tours; Sand, La Petite Fadette; Sainte-Beuve, Selected Essays; Hugo, Hernani. *Five hours a week for twenty weeks.* MR. NICHOLS; MR. THAYER.

B 3. FRENCH —Selections from French writers of the second half of the 19th century. *Five hours a fortnight for sixteen weeks.* MR. NICHOLS.

B 4. FRENCH.—Selections from French writers of the first half of the 19th century. *Five hours a fortnight for twenty weeks.* MR. NICHOLS.

B 5. GERMAN.—A general introductory course covering the main parts of the grammar.

The text-books are: Otis, Elementary German; Stern, Studien und Plaudereien; Storm, Immensee. *Five hours a week for sixteen weeks.* MR. ANDREWS.

B 6. GERMAN.—Riehl, Burg Neideck; Lessing, Minna von Barnhelm; Schiller, Wilhelm Tell. *Five hours a week for twenty weeks.* MR. ANDREWS.

B 7. GERMAN.—Goethe's Faust.

Five hours a fortnight for sixteen weeks. MR. NICHOLS.

B 8. GERMAN.—Schiller's Wallenstein.

Five hours a fortnight for twenty weeks. MR. NICHOLS.

B 9. SPANISH.—This course is designed to enable the student to read Spanish with only occasional difficulty of vocabulary or idiom. Given in 1896–7, and alternate years. Elective for those having completed course 2.

The text-books are: Edgren, Spanish Grammar; Knapp, Spanish Readings; Calderon, La Vida es Sueño. *Five hours a fortnight for sixteen weeks.* MR. NICHOLS.

B 10. SPANISH.—A continuation of course 9.

Five hours a fortnight for twenty weeks. MR. NICHOLS.

B 11. ITALIAN.—The main aim of this course is a reading knowledge of Italian. Given in 1897–8, and alternate years. Elective for those having completed course 2.

The text-books are: Grandgent, Italian Grammar; De Amicis, Cuore, and Alberto; Manzoni, I promessi Sposi. *Five hours a fortnight for sixteen weeks.* MR. NICHOLS.

B 12. ITALIAN —A continuation of course 11.

Five hours a fortnight for twenty weeks. MR. NICHOLS.

B 13. OLD FRENCH.—Paris, Extraits de la Chanson de Roland; Constans, Chrestomathie de l'Ancien Francais. Phonology and etymology.

One hour a week, counting as two, for sixteen weeks. MR. NICHOLS.

B 14. OLD FRENCH.—A continuation of course 13.

One hour a week, counting as two, for twenty weeks. MR. NICHOLS.

C—LATIN.

Mr. ANDREWS.

C 1. LIVY.—History of Rome, books I, II, XXI and XXII.

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

C 2. CICERO.—De Amicitia and De Senectute, selected letters.

The text-book is Montague's Letters of Cicero. *Five hours a week for twenty weeks.*

C 3. TACITUS.—Germania, Agricola, Annals.

The text-book is Hopkins' Germania and Agricola of Tacitus. *Five hours a fortnight for sixteen weeks.*

C 4. HORACE.—Odes and Epodes.

The text-book is Smith's Odes and Epodes of Horace. *Five hours a fortnight for twenty weeks.*

C 5. PLAUTUS AND TERENCE.—Trinummus. Terence, Phormio.

The text-book is Nicholson's Phormio of Terence. *Five hours a fortnight for sixteen weeks.*

C 6. PLINY THE YOUNGER.—Selected letters.

The text-book is Richard and Bernard's Letters of Pliny. *Five hours a fortnight for twenty weeks.*

C 7. JUVENAL AND HORACE.—The text-books are Lindsay's Satires of Juvenal, and Kirkland's Satires and Epistles of Horace. *Five hours a fortnight for sixteen weeks.*

C 8. TACITUS AND QUINTILIAN.—Annals. Quintilian, Institutes, book X.

The text-books are Tyler's Histories of Tacitus, and Frieze's Institutes of Quintilian. *Five hours a week for twenty weeks.*

D—LOGIC AND CIVICS.

PROFESSOR ROGERS.

D 1. GENERAL HISTORY.—The text-book is Myer's General History. *One hour a week for sixteen weeks.*

D 2. GENERAL HISTORY.—A continuation of course 1.
One hour a week for twenty weeks.

D 3. GENERAL HISTORY.—A study of primitive institutions and customs.

The text-book is Tylor's Anthropology. *Five hours a fortnight for twenty weeks.*

D 4. ENGLISH HISTORY.—The text-book is Green's Shorter History of the English People. *Five hours a fortnight for sixteen weeks.*

D 5. AMERICAN HISTORY.—Lectures, supplemented by topical investigation and study.

Two hours a week for twenty weeks.

D 6. THE PHILOSOPHY OF HISTORY.—The literature, learning, political and economic conditions of the great historic nations, and the growth of their institutions.

The text-book, Fisher's Outlines of General History, is supplemented by lectures and topical studies. Offered in even years. *Five hours a fortnight for sixteen weeks.*

D 7. PSYCHOLOGY.—In the brief time allotted to this subject only its outlines can be considered.

Five hours a week for ten weeks.

D 8. PSYCHOLOGY.—A course similar to course 7.
Five hours a fortnight for twenty weeks.

D 9. LOGIC.—The object of this course is to give the student a just appreciatian 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. Lectures.

Five hours a week for ten weeks.

D 10. HISTORY OF PHILOSOPHY.—The text-book is Schwegler's History of Philosophy. *Five hours a fortnight for sixteen weeks.*

D 11. CONSTITUTIONAL LAW AND HISTORY.—An outline of Anglo-Saxon institutions, the development of the English Constitution, the growth and political conditions of the American colonies, the Articles of Confederation, the adoption of the Constitution, and the comparative study of the Federal and the State Constitution from the historical and legal standpoints.

The text-book is Roger's Our System of Government. *Five hours a week for sixteen weeks.*

D 12. POLITICAL ECONOMY.—Instruction is given by lectures. Topical readings and investigation are required.

Five hours a week for twenty weeks.

D 13. MUNICIPAL LAW.—Lectures on the general principles of contracts, sales, notes, bills, conveyancing, agency, bailments, and insurance.

One hour a week for twenty weeks.

D 14. INTERNATIONAL LAW.—The text-book is Wolsey's International Law. Offered in odd years. *Five hours a fortnight for sixteen weeks.*

D 15. LIBRARY WORK.—The aim of this work is to familiarize the student with the literature of history and economies and to teach him to make critical and independent investigation of questions arising in connection with these subjects.

† *Five hours a week for twenty weeks.*

E—MATHEMATICS AND ASTRONOMY.

PROFESSOR HART; PROFESSOR FERNALD; MR. ROBINSON; MR. WALKER.

E 1. SOLID GEOMETRY.—Solid and spherical geometry, including the mensuration of solids, and original demonstrations.

The text-book is Baker's Solid Geometry. *Five hours a week for eight weeks.* MR. ROBINSON; MR. WALKER.

E 2. ALGEBRA.—Review of quadratic equations and of the binomial theorem with integral, fractional, and negative exponents; variation; progression; convergence and divergence of series.

The text-book is Wells' College Algebra. *Five hours a week for eight weeks.* MR. ROBINSON; MR. WALKER.

E 3. ALGEBRA.—Undetermined coefficients; partial fractions; permutations and combinations; probability; logarithms; exponential and logarithmic series; computation of logarithms; the theory of equations.

The text-book is Wells' College Algebra. *Five hours a week for eight weeks.* MR. ROBINSON; MR. WALKER.

E 4. TRIGONOMETRY.—Plane and spherical trigonometry.

The text-book is Bowser's Elements of Trigonometry. *Five hours a week for twelve weeks.* MR. ROBINSON.

E 5. ANALYTICAL GEOMETRY.—A brief study of the point, right line, and conic sections.

The text-book is Briggs' Analytic Geometry. *Five hours a fortnight for sixteen weeks.* MR. ROBINSON.

E 6. ANALYTICAL GEOMETRY.—A more extended course; the straight line and conic sections, including polar and oblique coordinates; equation of the second degree; introduction to solid analytical geometry.

The text-book is Nichols' Analytic Geometry. *Five hours a week for sixteen weeks.* PROF. HART; PROF. FERNALD.

E 7. CALCULUS.—Differentiation; integration by fundamental formulas; integration regarded as a summation; definite integrals.

The text-book is Osborne's Differential and Integral Calculus. *Five hours a week for twenty weeks.* PROF. HART; PROF. FERNALD.

E 8. CALCULUS.—Applications of differential calculus; various methods of integration; applications of integral calculus.

The text-book is Osborne's Differential and Integral Calculus. *Five hours a fortnight for sixteen weeks.* PROF. HART.

E 9. DESCRIPTIVE ASTRONOMY.—The text-book is supplemented by informal lectures, and illustrated by lantern slides, the Trouvelot drawings of celestial objects, and observations with an equatorial telescope.

The text-book is Young's Elements of Astronomy. *Five hours a fortnight for twenty weeks.* PROF. HART.

E 10. PRACTICAL ASTRONOMY.—Problems in the conversion of time, the determination of terrestrial latitudes and longitudes, and the establishment of meridian lines. The instruments used are the sextant, and artificial horizon, a portable chronometer, theodolite, and vertical circle.

Five hours a fortnight for twenty weeks. PROF. HART.

E 11. ADVANCED ALGEBRA.—Determinants and the solution of higher equations.

Five hours a fortnight for twenty weeks. PROF. HART.

E. 12. MODERN ANALYTICAL GEOMETRY.—An introduction to the use of trilinear coordinates, determinants, and the abridged notation in the study of the conic sections and solid geometry. Given in 1897-8 and alternate years.

Five hours a fortnight for sixteen weeks. PROF. HART.

E 13. ADVANCED INTEGRAL CALCULUS. Chapters from Byerly's Integral Calculus, with lectures. Given in 1897-8 and alternate years.

Five hours a fortnight for twenty weeks. PROF. HART.

E 14. THEORY OF EQUATIONS.—Given in 1896-7 and alternate years.

The text-book's Todhunter's Theory of Equations. *Five hours a fortnight for sixteen weeks.* PROF. HART.

E. 15. DIFFERENTIAL EQUATIONS.—Given in 1896-7 and alternate years.

The text-book is Osborne's Examples of Differential Equations. *Five hours a fortnight for twenty weeks.* PROF. HART.

E 16. PRACTICAL ASTRONOMY.—The theory and use of the sextant, universal instrument, transit, and zenith telescope. Given in 1897-8 and alternate years.

Five hours a fortnight for sixteen weeks. PROF. HART.

E 17. PRACTICAL ASTRONOMY.—A continuation of course 16. Given in 1897-8 and alternate years.

Five hours a week for twenty weeks. PROF. HART.

F—PHYSICS.

PROFESSOR STEVENS; MR. WESTON.

F 1. GENERAL PHYSICS.—Recitations and problems; experiments before the class, and lectures on modern physical theories and subjects not discussed in the text-book.

The text-book is Carhart's University Physics. *Five hours a week for sixteen weeks.* PROF. STEVENS; MR. WESTON.

F 2. GENERAL PHYSICS.—A continuation of course 1.

The text-book is Carhart's University Physics. *Five hours a fortnight for twenty weeks.* PROF. STEVENS; MR. WESTON.

F 3. ELEMENTARY PHYSICS.—A non-mathematical course, covering the ground of course 1. The recitations are supplemented by lectures and experimental demonstrations.

The text-book is Carhart and Patterson's Elements of Physics. *Five hours a fortnight for sixteen weeks.* MR. WESTON.

F 4. ELEMENTARY PHYSICS.—A continuation of course 3.

The text-book is Carhart and Patterson's Elements of Physics. *Five hours a fortnight for twenty weeks.* MR. WESTON.

F 5. LABORATORY PHYSICS.—The subjects usually included in an under-graduate course. Especial attention is given to the reduction of observations, and the tabulation of results.

Nichols' Laboratory Manual is made the basis of most of the experiments. †*Five hours a week for twenty weeks.* PROF. STEVENS; MR. WESTON.

F 6. LABORATORY PHYSICS.—This course is arranged with special reference to the needs of students in the short course in pharmacy. It includes calibration, thermometry, distillation, the theory and use of balances, the determination of specific gravity and specific heat of solids and liquids by the usual methods.

† *Three hours a week for twenty weeks.* MR. WESTON.

F 7. ADVANCED OPTICS.—Lectures in continuation of course 1, based chiefly upon Preston's Light.

Five hours a fortnight for sixteen weeks. PROF. STEVENS.

F 8. MATHEMATICAL PHYSICS.—One course in mathematical physics is offered each year. This year it is a general mathematical course.

Five hours a fortnight for sixteen weeks. PROF. STEVENS.

F 9. LABORATORY PHYSICS.—General laboratory work in continuation of course 5.

†*Five hours a week for sixteen weeks.* PROF. STEVENS.

F 10. LABORATORY PHYSICS.—Advanced laboratory work in optics, in continuation of course 9.

†*Five hours a week for twenty weeks.* PROF. STEVENS.

G—DRAWING.

MR. BOARDMAN.

G 1. DRAWING.—Free-hand work in perspective and model drawing.

The text-book is Prang's Form Study and Drawing. † *Five hours a week for sixteen weeks.*

G 2. MATHEMATICAL DRAWING.—The plotting of functions, and the solution of equations by the graphic method.

† *Three hours a week for ten weeks.*

G 3. MECHANICAL DRAWING.—Instruction and practice in the care and use of drawing instruments, in the drawing of geometrical problems, and in the use of water colors. Especial attention is given to accuracy and neatness.

† *Five hours a week for twenty weeks.*

G 4. MECHANICAL DRAWING.—Problems in shades and shadows, and dimension drawing.

The text-book is Faunce's Mechanical Drawing. † *Seven hours a week for sixteen weeks.*

G 5. GENERAL DRAWING.—Isometric and cabinet projections, perspective, and the preparation of working drawings. Lectures and exercises in the drawing room.

† *Ten hours a week for twelve weeks.*

G 6. DESCRIPTIVE GEOMETRY.—The time is divided equally between the recitation room and drawing room. The drawing consists of sixteen elementary problems, twelve tangent problems, and eight 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 fortnight for sixteen weeks.*

G 7. DESCRIPTIVE GEOMETRY.—A continuation of course 6. *Three hours a fortnight for twenty weeks.*

G 8. STEREOTOMY.—The application of the methods of descriptive geometry to the preparation of drawings for retaining walls, bridge abutments, piers, arches, etc.

† *Three hours a week for twenty weeks.*

G 9. DETAIL DRAWING.—The preparation of complete working drawings of an electrical machine from a model.

† *Four hours a week for twenty weeks.*

H.—CHEMISTRY.

PROFESSOR AUBERT; MR. COLBY; MR. JACKMAN.

H 1. GENERAL CHEMISTRY.—Recitations and lectures on the general principles of chemistry, illustrated by charts, experiments, etc.

The text-books are Fisher's Lessons in Elementary Chemistry, and Hart's Laboratory Exercises for Beginners in Chemistry. *Five hours a fortnight for sixteen weeks.* PROF. AUBERT; MR. COLBY.

H 2. GENERAL CHEMISTRY.—A continuation of course 1. One exercise in each week is given to introductory laboratory work, consisting of the preparation of the more common elements and inorganic compounds, a study of their properties, and of elementary qualitative analysis.

The text-books are Fisher's Lessons in Elementary Chemistry, Attfield's Chemistry, and Hart's Laboratory Exercises for Beginners in Chemistry. *Five hours a fortnight for twenty weeks.* PROF. AUBERT; MR. COLBY; MR. JACKMAN.

H 3. CHEMICAL THEORY.—The text-book is Walker and Dobson's Chemical Theory. *Five hours a fortnight for sixteen weeks.* MR. COLBY.

H 4. INORGANIC CHEMISTRY.—The non-metallic elements.

The text-book is Serres Principes de Chimie, vol. 1. *Five hours a fortnight for twenty weeks.* MR. COLBY.

H 5. INORGANIC CHEMISTRY.—The metals.

The text-book is Serres Principes de Chimie, vol. 2. *Five hours a fortnight for sixteen weeks.* MR. COLBY.

H 6. ORGANIC CHEMISTRY.—Lectures and recitations, illustrated by specimens from the collection of organic chemicals; and supplemented by a laboratory course in the preparation of organic compounds.

The text-book is Serres Principes de Chimie, vol. 3. *Five hours a fortnight for twenty weeks.* PROF. AUBERT.

H 7. ORGANIC CHEMISTRY.—A short course setting forth the properties of organic compounds, the general methods of preparing them, and special methods for preparing some of the most important.

The text-book is Turpin's Organic Chemistry. *Five hours a fortnight for sixteen weeks.* PROF. AUBERT.

H 8. CHEMICAL READING.—Study and translations of foreign works.

One hour a week for sixteen weeks. PROF. AUBERT.

H 9. LABORATORY PROCESSES.—Laboratory methods and processes used in the arts.

Five hours a fortnight for sixteen weeks. PROF. AUBERT.

H 10. ORGANIC CHEMICALS.—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. †*Twenty-two hours a week for four weeks.* PROF. AUBERT.

H 11. PHOTOGRAPHY.—Lectures on photography and photographic chemistry, and practical work.

†*Two hours a week for twenty weeks.* MR. COLBY.

H 12. MINERALOGY.—Determinative mineralogy and blowpipe analysis.

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

H 13. QUALITATIVE ANALYSIS.—The determination and separation of acids and bases in simple and complex substances; and the writing of the reactions.

The text-book is Medicus' Qualitative Analysis. *The time varies*; *it is stated in the tables.* MR. COLBY.

H 14. ADVANCED QUALITATIVE ANALYSIS.—The text-book is Medicus' Qualitative Analysis. *The time varies; it is stated in the tables.* MR. COLBY.

H 15. ELEMENTARY QUANTITATIVE ANALYSIS.—The gravimetric determination of simple substances.

The text-book is Appleton's Quantitative Analysis. *The time varies; it is stated in the tables.* PROF. AUBERT.

H 16. QUANTITATIVE ANALYSIS.—A continuation of course 15. *The time varies; it is stated in the tables.* PROF. AUBERT.

H 17. QUANTITATIVE ANALYSIS.—Analysis of complex alloys, minerals, etc.

The text-book is Cowles and Coleman's Quantitative Analysis. †*Ten hours for sixteen weeks.* PROF. AUBERT.

H 18. VOLUMETRIC ANALYSIS AND ASSAYING.—Acidimetry, alkalimetry, oxydimetry; gold and silver assaying.

The text-book is Cowles and Coleman's Quantitative Analysis, and Clark's Assay Notes. *The time varies; it is stated in the tables.* PROF. AUBERT.

H 19. AGRICULTURAL ANALYSIS.—The analysis of fodders, fertilizers, milk, and other agricultural products. The methods are those recommended by the Association of Official Agricultural Chemists.

The time varies; it is stated in the tables. PROF. AUBERT.

H 20. TOXICOLOGY AND BIOLOGICAL ANALYSIS.—The determination of the commoner poisons; the analysis of urine and other animal secretions and products, normal and pathological.

The text-book is Witthaws' Urinalysis. *The time varies; it is stated in the tables.* PROF. AUBERT.

H 21. THESIS WORK.—Each student in the chemical course is required, as a condition of graduation, to prepare a thesis on some chemical subject embodying the results of original work in analysis or research.

† *Twenty-two hours a week for sixteen weeks.*

I—NATURAL HISTORY.

PROFESSOR HARVEY.

I 1.—CRYPTOGAMIC BOTANY.—A detailed study of about thirty type forms. Special attention is given to useful and injurious fungi, to fungicides and spraying apparatus. Students collect specimens and prepare a herbarium.

The facilities are a convenient laboratory, a good working library, a herbarium of five thousand species, a set of Brendel models, charts, and a rich local cryptogamic flora.

Five hours a fortnight for sixteen weeks.

I 2. LABORATORY BOTANY.—The use of the microscope, micrometers, camera lucida and microtome; the preparation of slides; the analysis, description, classification, illustration of cryptogams, and their preparation for the herbarium.

† *Two hours a week for sixteen weeks.*

I 3. ADVANCED PHYSIOLOGY.—Lectures on the anatomy, physiology, hygiene and pathology of the human body, illustrated by a skeleton, manikin, models of the human larynx, ear, eye, and brain, charts, microscopic slides, fresh, dried, and alcoholic material.

Five hours a fortnight for twenty weeks.

I 4. LABORATORY PHYSIOLOGY.—Examination of skeleton, manikin, charts, models, microscopic slides, and the dissection of lower animals.

†*Two hours a week for twenty weeks.*

I 5. INVERTEBRATE ZOOLOGY.—The detailed study of type forms of all the branches. The student uses the compound microscope, 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.

Five hours a fortnight for sixteen weeks.

I 6. LABORATORY ZOOLOGY.—A continuation of course 5.

†*Five hours a week for sixteen weeks.*

I 7. HELMINTHOLOGY.—A course in zoology with especial attention to helminthology.

†*Four hours a week for twenty weeks.*

I 8. COMPARATIVE VERTEBRATE ZOOLOGY.—A comparative study of type forms of vertebrate animals. Special attention is given to the zoology of the domestic animals. The department is provided with a set of Auzoux's models and a good working collection of type forms.

The text-book is Packard's Zoology. *Seven hours a fortnight for sixteen weeks.*

I 9. LABORATORY ZOOLOGY.—Museum work; study of charts, and models; dissections of a fish, frog, turtle, bird, and rat; methods of preparing specimens for collections.

†*Four hours a week for twenty weeks.*

I 10. ENTOMOLOGY.—The anatomy, physiology, classification, and economic importance of insects. 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. *Five hours a fortnight for twenty weeks.*

I 11. GEOLOGY.—Especial attention is given to the origin and formation of soils, to the method of conducting a geological sur-

vey, and to the geology of Maine. The course is illustrated by mineral, rock, and fossil specimens, and by charts, maps, and diagrams.

The text-book is Le Conte's Elements of Geology. *Five hours a fortnight for sixteen weeks.*

I 12. HUMAN ANATOMY.—A detailed study of the human skeleton. Examination of a manikin showing details of the respiratory, digestive, circulatory, reproductive, depurgatory, nervous, and muscular systems, and of the organs of the special senses.

The text-book is Gray's Anatomy. *Five hours a fortnight for twenty weeks.*

J—AGRICULTURE.

PROFESSOR WOODS; PROFESSOR GOWELL; DR. RUSSELL; DR. FAY.

J 1. BIOLOGICAL CHEMISTRY.—Lectures and recitations on the chemical changes in nature important to agriculture, the composition of air, soils, natural waters, and plants, the sources and assimilation of plant food, and the chemical processes and methods of investigation by which these subjects are studied.

The text-book is Johnson's How Crops Grow. *Five hours a fortnight for sixteen weeks.* DR. FAY.

J 2. BIOLOGICAL CHEMISTRY.—A continuation of course 1. Lectures and recitations in physiological chemistry, including the composition of the animal body, the composition of food materials, the chemical changes involved in the digestion and assimilation of food; also the chemistry of milk and dairy products, and the chemical processes and methods of investigation by which these subjects are studied.

The text-book is Halliburton's Chemical Physiology and Pathology. *Five hours a week for twenty weeks.* DR. FAY.

J 3. AGRICULTURAL CHEMISTRY.—Lectures on the origin, composition, preparation and use of commercial fertilizers, the supply, composition, care and use of farm manures, and the general considerations which pertain to the maintenance of soil fertility.

Five hours a fortnight for eight weeks. PROF. WOODS.

J 4. AGRICULTURAL PHYSICS.—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 fortnight for ten weeks. PROF. WOODS.

J 5. AGRICULTURAL ENGINEERING.—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 fortnight for ten weeks. PROF. GOWELL.

J 6. STOCK FEEDING.—Lectures on the production of cattle foods and their composition, on formulating rations for milk and meat production, and application of the lectures to the animals in the herd.

The text-books are Armsby's Cattle Feeding, Stewart's Feeding Animals, and experiment station reports. *Five hours a fortnight for eight weeks.* PROF. GOWELL.

J 7. DAIRYING.—Lectures upon the formation and composition of milk; sources of infection; bacteria and their relation to dairying; ferments and their effects.

The text-books are Grotenfelt and Woll's Principles of Modern Dairy Practice, Stewart's Dairyman's Manual, Flint's Milch Cows and Dairy Farming, and Arnold's American Dairying. *Five hours a week for six weeks.* PROF. GOWELL.

J 8. STOCK BREEDING.—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, Saunder's Horse Breeding, and Curtis' Breeds. *Five hours a week for eight weeks.* PROF. GOWELL.

J 9. POULTRY INDUSTRY.—Lectures, with practice in handling poultry, and judging by a scale of points; in breeding; in hatching 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.

J 10. DAIRY PRACTICE.—The treatment and handling of milk and cream; milk testing for fat and other solids; aeration, pasteurization and sterilization of milk and cream; the application of acid tests and ferments to butter and cheese making; operating and caring for the boiler, engine, gravity creamers, centrifugal separators, churns, workers, vats, presses, and the making, curing and judging of butter and cheese, together with the business management of factories and creameries. Each student must provide himself with two suits of clothes made of white drilling.

†*Seven hours a week for fourteen weeks.* PROF. GOWELL.

J 11. VETERINARY SCIENCE.—Lectures, demonstrations and clinics, illustrated by models, natural preparations, and living animals.

Five hours a fortnight for twenty weeks. DR. RUSSELL.

J 12. DISSECTING.—A brief course intended to make the student familiar with the location and appearance of the more important organs of the animal body.

†*Seven hours a week for six weeks.* DR. RUSSELL.

J 13. BACTERIOLOGY.—Methods of cultivating bacteria, the morphological and biological character of bacteria and fungi, particularly of those relating to disease, and of those of importance from an economic standpoint, the methods of making biological examinations of air, water, etc. During the time given to laboratory work, exercises in this course will be held every day, and the number of exercises will be correspondingly decreased. The instructor will arrange for an exchange of time with other laboratory courses.

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

J 14. ANIMAL HISTOLOGY.—Dissecting and the preparation of the most important tissues and organs, accompanied with lectures and recitation.

†*Ten hours a week for ten weeks.* DR. RUSSELL.

J 15. LABORATORY BACTERIOLOGY.—An advanced course.

†*Ten hours a week for ten weeks.* DR. RUSSELL.

K—HORTICULTURE.

PROFESSOR MUNSON.

K 1. POMOLOGY.—The economic importance, methods of culture, and marketing of fruits; the principles and practice of spraying plants.

Five hours a fortnight for ten weeks.

K 2. OLERICULTURE, OR VEGETABLE GARDENING.—The history and uses of leading garden vegetables, with directions for their culture in the field and under glass. Lectures and practical demonstrations.

Five hours a fortnight for ten weeks.

K 3. PLANT VARIATION.—A discussion of the underlying principles of horticulture. The origin and distribution of cultivated plants; their variation as affected by soil, climate, and cultivation; 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 course 7.

Five hours a fortnight for eight weeks.

K 4. LANDSCAPE GARDENING.—The principles of landscape art and their application.

Five hours a fortnight for eight weeks.

K 5. LABORATORY HORTICULTURE.—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 twenty weeks.*

K 6. LABORATORY HORTICULTURE.—A continuation of course 5.

†*Five hours a week for sixteen weeks.*

K 7. GENERAL BOTANY.—The structure and functions of the organs of plants; the development and relationship of the leading groups. Lectures, supplemented by laboratory work in the greenhouses and the field.

Gray's School and Field Book of Botany is used for reference.

†*Five hours a week for twenty weeks.*

K 8. HISTOLOGY OF PLANTS.—A description and comparison of tissues with investigation of the minute anatomy of vegetable organs and studies in the phenomena of cell development and fertilization.

†*Five hours a week for ten weeks.*

L—PHARMACY.

MR. JACKMAN.

L 1. PHYSICAL AND OFFICIAL PHARMACY.—The history of pharmacopœias, dispensatories, etc.; weights and measures, specific gravity, the pharmaceutical uses of heat, distillation, solution, filtration, etc.; official preparations; pharmaceutical problems, involving percentage solutions, parts by weight, and measure, chemical principles and equations, actual pharmacy operations.

The text-book is Remington's Practice of Pharmacy. *Five hours a week for sixteen weeks.*

L 2. INORGANIC, ORGANIC, AND EXTEMPORANEOUS PHARMACY.—The elements, the official salts, and inorganic acids, their preparation and classification. Organic compounds, their classification, official preparations; official drugs of the Materia Medica classified according to their proximate principles, the preparations of these drugs, etc., animal preparations Extemporaneous pharmacy; the principles of dispensing, store management, etc.

The text-book is Remington's Practice of Pharmacy, *Five hours a week for sixteen weeks.*

L 3. LABORATORY PHARMACY.—Official preparations and tests. The operations of manufacturing pharmacy, including the preparation of granular and scale salts, infusions, syrups, tinctures, etc. Official tests of chemicals, drugs, and preparations, for identity, strength, adulteration, etc.

The text-book is Remington's Practice of Pharmacy, or the U. S. Pharmacopœia. †*Ten hours a week for sixteen weeks.*

L 4. PHARMACOPŒIA AND PRESCRIPTIONS.—A complete review of the pharmacopœia, with especial reference to the chemical and pharmaceutical principles involved in processes and preparations; critical examination of copies of prescriptions

THE ENGINEERING BUILDING.

from actual files, with reference to inelegance, physiological pharmaceutical, and chemical incompatibility; doses; methods and order of compounding, etc.

The text-book is Remington's Practice of Pharmacy. *Three hours a week for twenty weeks.*

L 5. INORGANIC PHARMACOGNOSY.—Official and common names, practical exercises in the identification of specimens.

The text-book is the Era Key to the U. S. Pharmacopœia. *Five hours a fortnight for sixteen weeks.*

L 6. ORGANIC PHARMACOGNOSY. — Official and common names, practical exercises.

The text-book is the Era Key to the U. S. Pharmacopœia. *Four hours a week for twenty weeks.*

L 7. MATERIA MEDICA.—Chemicals and drugs, their nature, uses, classification, therapeutic action, and doses; poisons, and antidotes.

The text-book is White and Wilcox's Materia Medica. *Three hours a week for sixteen weeks.*

L 8. THESIS WORK.– Each student in the pharmacy courses is required, as a condition of graduation, to prepare a thesis, embodying the results of original work in analysis or research.

† *Ten hours a week for twenty weeks.*

M—CIVIL ENGINEERING.

PROFESSOR HAMLIN; ASSISTANT PROFESSOR GROVER.

M 1. PLANE SURVEYING.—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 Johnson's Surveying. *Twenty weeks, three hours a week during the first ten weeks, and two hours a week during the last ten weeks.* PROF. GROVER.

M 2. FIELD WORK IN SURVEYING.—The uses of the chain, compass, transit, and level. 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. Plats are prepared of the surveys made in the field.

Twenty weeks, †three hours a week during the first ten weeks, and †five hours a week during the second ten weeks. PROF. GROVER.

M 3. RAILROAD ENGINEERING.—Lectures and recitations on 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, and the theory of economic location.

The text-book is Searles's Field Engineering. *Seven hours a fortnight for twelve weeks.* PROF. GROVER.

M 4. RAILROAD WORK.—The location and detailed survey of a railroad several miles long. 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.

†*Five hours a week for sixteen weeks.* PROF. GROVER.

M 5. HIGHWAY ENGINEERING.—The location, construction, and improvement of country roads under different conditions of soil, climate, and traffic.

Seven hours a fortnight for four weeks. PROF. GROVER.

M 6. MECHANICS.—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 Church's Mechanics of Engineering. *Five hours a week for sixteen weeks.* PROF. GROVER.

M 7. MECHANICS.—A continuation of course 6.

The text-book is Church's Mechanics of Engineering. *Five hours a week for twenty weeks.* PROF. GROVER.

M 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.

Five hours a fortnight for sixteen weeks. PROF. GROVER.

M 9. SANITARY ENGINEERING.—Lectures on land drainage, drainage of houses and towns, plumbing of houses, sewerage of towns and cities, and the ventilation of houses.

Five hours a fortnight for sixteen weeks. PROF. HAMLIN.

M 10. HIGHER SURVEYING.—The plane table, the solar compass as applied to the survey of public lands, stadia measurements, topographical surveying, the elements of geodesy, the measurement of base lines, calculation of a system of triangulation.

†*Ten hours a week for eight weeks.* PROF. HAMLIN.

M 11. HYDRAULICS.—The weight, pressure, and motion of water; the flow of water through orifices and pipes; 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 text-books are Fanning's Hydraulics, and Church's Mechanics of Engineering. *Five hours a week for seven weeks.* PROF. HAMLIN.

M 12. HYDRAULICS FIELD WORK.—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.

†*Seven hours a week for eight weeks.* PROF. HAMLIN.

M 13. 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, Church's Mechanics of Materials. Lectures. *Five hours a week for nine weeks.* PROF. HAMLIN.

M 14. FOUNDATIONS, MASONRY CONSTRUCTION, AND CEMENTS. The testing and use of the materials of masonry construction. 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. *Seven hours a fortnight for twenty weeks.* PROF. HAMLIN.

M 15. DESIGNING.—The student is taught the method of calculating the stresses in the various forms of roof and bridge trusses, and the methods of loading.

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

M 16. DESIGNING AND THESIS WORK.—A continuation of course 15. Designs for bridges in wood and in iron, working out the dimensions of the parts, and preparing the drawings for the shop.

† *Twelve hours a week for twenty weeks.* PROF. HAMLIN.

N—MECHANICAL ENGINEERING.

PROFESSOR FLINT; MR. WEBB; MR. WALKER.

N 1. MACHINE DESIGN.—Rules and formulas are applied to existing machines of standard manufacture for the comparison of the actual and theoretical dimensions. In connection with this work the student is required to design a complete speed lathe and make working drawings for its construction.

The text-book is Benjamin's Machine Design. †*Seven hours a week for twenty weeks.* PROF. FLINT.

N 2. MACHINE DESIGN.—A brief course.

The text-book is Benjamin's Machine Design. †*Seven hours a fortnight for twenty weeks.* PROF. FLINT.

N 3. CARPENTRY.—Instruction and practice in the care and sharpening of tools, the squaring of stock, and taking work out of wind; followed by practice in making the different joints in soft and hard wood. Wood turning. The charge for materials is $5.00 a term.

†*Six hours a week for sixteen weeks.* MR. WALKER.

N 4. FORGE WORK.—Drawing and upsetting; 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. Moulding and pouring. The charge for materials is $5.00 a term.

†*Eight hours a week for twenty weeks.* MR. WALKER.

N 5. 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 sixteen weeks.* MR. WALKER.

N 6. ANALYTIC MECHANICS —A continuation of course 5.

The text-book is Bowser's Analytic Mechanics. *Five hours a week for eight weeks.* MR. WALKER.

N 7. APPLIED MECHANICS.—Stress, its resultants and centers, moments, moments of inertia, theory of mechanism, uniform motion under balanced forces, rotation of rigid bodies.

The text-book is Rankine's Applied Mechanics. *Five hours a week for twelve weeks.* MR. WALKER.

N 8. APPLIED MECHANICS.—The theory of structures.

The text-book is Rankine's Applied Mechanics. *Five hours a fortnight for sixteen weeks.* MR. WALKER.

N 9. KINEMATICS.—The construction of cams, lobed wheels and gear teeth. The methods for transforming motion, illustrated by the solution of practical problems. The construction of cycloidal and involute gears. Lectures.

†*Five hours a week for sixteen weeks.* PROF. FLINT.

N 10. KINEMATICS.—A brief course.

†*Three hours a week for sixteen weeks.* PROF. FLINT.

N 11. 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' Link and Valve Motion. *Five exercises, counting as four hours, a week for sixteen weeks.* MR. WEBB.

N 12. LINK AND VALVE MOTION.—A brief course.

Five exercises, counting as four hours, a week for eight weeks. MR. WEBB.

N 13. MACHINE WORK.—Exercises in filing and chipping; lathe work, drilling, boring and threading in the lathe, making cut gears, machinist's taps, finished bolts, and exercises on the planer and shaper. Each student provides himself with center guage, steel scale, and a set of files at a cost of $2.50. The charge for materials is $5.00 a term. Students who have worked in commercial shops, will be given credit for their work on presentation of satisfactory proof.

The time devoted to machine work varies; it is stated in the tables. MR. WEBB.

N 14. HYDRO-MECHANICS.—The behavior of liquids in motion and under pressure, flowing through pipes and in open channels, with problems involving a large number of different conditions.

The text-book is Bowser's Hydromechanics. *Three hours a fortnight for twenty weeks.* PROF. FLINT.

N 15. STEAM BOILERS.—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. The student is required to design a boiler 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 Benjamin's Heat and Steam. *Five hours a fortnight for twenty weeks.* PROF. FLINT.

N 16. STEAM BOILERS.—Additional work similar to that of course 15.

The text-book is Benjamin's Heat and Steam. *Five hours a fortnight for twenty weeks.* PROF. FLINT.

N 17. STEAM BOILERS.—A brief course, for students in electrical engineering.

Two hours a week for twenty weeks. PROF. FLINT.

N 18. TESTING.—Instruction is given in testing steam guages, boilers, etc. The properties of the various metals and their behavior under tension and compression, are illustrated by the use of the testing machine.

Two hours a week for twenty weeks. PROF. FLINT.

N 19. 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.

N 20. 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 the indicator. By means of diagrams the student 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.

The text-book is Whitham's Steam Engine Design. †*Ten hours a week for ten weeks.* PROF. FLINT.

N 21. THESIS WORK.—Each student in the mechanical engineering course is required to prepare a thesis, as a condition of graduation, which is to consist of a design of some piece of machinery.

† *Ten hours a week for ten weeks.* PROF. FLINT.

O—ELECTRICAL ENGINEERING.

PROFESSOR STEVENS; MR. LANPHEAR.

O 1. ELECTRICITY AND MAGNETISM.—This course continues the subject of electricity and magnetism begun in physics. Lectures are given, and laboratory methods and results are discussed with the class.

The text-book is Silvanus Thompson's Electricity and Magnetism. *Two hours a week for sixteen weeks.* MR. LANPHEAR.

O 2. ELECTRICITY AND MAGNETISM.—A continuation of course 1. The work is more directly connected with the dynamo and apparatus connected with its operation.

The text-book is Houston and Kennelly's Electrical Engineering Leaflets. *Three hours a week for twenty weeks.* MR. LANPHEAR.

O 3. ELECTRICAL MEASUREMENTS AND TESTING.—This is the usual junior laboratory course. The work consists of the measurement of resistance, potential, capacity, and current, the testing of galvanometers, electrolysis, etc. The charge for this course is $2.50.

†*Four hours a week for sixteen weeks.* PROF. STEVENS; MR. LANPHEAR.

O 4. ELECTRICAL MACHINERY.—Lectures on the theory and construction of dynamos, motors, etc.

Two hours a week for sixteen weeks. MR. LANPHEAR.

O 5. ELECTRICAL ENGINEERING.—The designing, construction, and operating of alternating current machinery and the use of direct and alternating current machinery in lighting, and the transmission of power.

Five hours a fortnight for ten weeks. MR. LANPHEAR.

O 6. ELECTRICAL DESIGN.—This course corresponds to the course in machine design given to the students in mechanical engineering. Each student is required to make the computations and complete drawings for a dynamo.

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

O 7. ELECTRICAL DESIGN.—The problems involved in designing alternating current machinery, in the electrical transmission of power, and in the distribution of electric light.

†*Five hours a week for twenty weeks.* MR. LANPHEAR.

O 8. LABORATORY ELECTRICITY.—Tests of electrical instruments; experimental work with dynamos, motors, etc.; tests of efficiency; photometric tests of electric lamps; the practical management of the electric light plant. The charge for this course is $2.50.

†*Eight hours a week for eight weeks.* MR. LANPHEAR.

O 9. THEORETICAL ELECTRICTY.—Lectures on the mathematical theory of electrical instruments. This course will be varied from year to year.

Five hours a fortnight for ten weeks. PROF. STEVENS.

O 10. POWER STATIONS.—The selection and arrangement of power house machinery; methods of operation. Lectures.

Two hours a week for sixteen weeks. MR. LANPHEAR.

O 11. SHOP WORK.—The winding of armatures and magnets, the building up of transformer cores and the winding of transformers and impedance coils, the construction of condensers for alternating current circuits, construction of rheostats and bridges, tangent and ballistic galvanometers, ammeters and other measuring instruments, a standard cell, a secondary battery, the preparation of fuse wire and fuses, the construction of automatic switches and arc lamps. The charge for this course is $5.00.

†*Four hours a week for sixteen weeks.* MR. LANPHEAR.

O 12. THESIS WORK.—A continuation of course 8. The student devotes a large part of his time to some special investigation selected as the subject for his graduating thesis. The charge for this course is $2.50.

†*Six hours a week for twenty weeks.* MR. LANPHEAR.

P—MILITARY SCIENCE AND TACTICS.

Each man student is required to take millitary drill, unless physically unfit, and to attend recitations in military science.

The drill, course 1, occupies the first thirteen weeks of the fall term, and the last thirteen weeks of the spring term, one hour a day, and three days in the week, counting as one hour and a half in reckoning the student's total time. The remaining three weeks in the fall term, and seven weeks in the spring term, are given: by the senior class, to recitations in military science, course 4, three recitations a fortnight; by the junior class, to recitations in military science, course 3, three recitations a fortnight; by the sophomore classes, to recitations in military science, course 2, three hours a fortnight; by the freshman class, to mathematical drawing.

P 1. MILITARY DRILL.—(a.) Infantry exercises begin with setting-up exercises and military gymnastics, and continue with manual of arms and bayonet exercise. School of the 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 sentinal, learn advance guard and outpost duties, and work out practically the problems of minor tactics. Required of all men students.

†*Three hours a week for the first thirteen and last thirteen weeks of each year.*

P 2. GUARD DUTY.—Recitations on the Manual of Guard Duty. Required of sophomores.

Three hours a fortnight for ten weeks.

P 3. DRILL REGULATIONS.—Recitations on U. S. Infantry Drill Regulations. Required of juniors.

Three hours a fortnight for ten weeks.

P 4. ART OF WAR.—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; studies on campaigns illustrating the principles of the art of war. Required of seniors.

The text-book is Mercur's Elements of the Art of War. *Three hours a fortnight for ten weeks.*

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.

THE COURSES OF STUDY.

The courses of study are conveniently arranged in three groups: one group including the general courses; a second including the chemical and other scientific courses; the third including the engineering courses.

These courses lead to degrees and occupy four years. In some lines shorter courses are provided. The studies of the freshman year are nearly the same for all courses, and are intended to furnish the foundation for the work of the later years. All courses include many studies which are especially useful for general training and culture. Detailed descriptions of these courses will be found in the pages immediately following this general description.

THE GENERAL COURSES.

THE LATIN-SCIENTIFIC COURSE is designed for those who seek the college for general culture and training, and especially for those who expect to become teachers.

THE GENERAL SCIENTIFIC COURSE differs from the Latin-Scientific Course, in substituting modern languages for Latin. Students in either of these courses may devote especial attention to mathematics, physics, or natural history.

The Technical Scientific Courses.

The Chemical Course is designed for those who wish to become professional analysts, teachers of chemistry, or managers of industries in which an extensive knowledge of chemistry is needed.

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 Preparatory Medical Course is designed for those who propose to take up the study of medicine after graduation and wish to so shape their college work as to obtain the best preparation.

The Pharmacy Course is designed for those who wish to prepare themselves for the practice of pharmacy, and at the same time obtain a broad general training.

The Engineering Courses.

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 managers of manufacturing plants, or general mechanical engineers.

The Electrical Engineering Course is designed for those who wish to fit themselves for any line of practical work in electricity.

The Short Courses.

The Pharmacy Course, of two years, is designed for those who wish to obtain a practical training in pharmacy in the shortest time.

The ELECTRICAL ENGINEERING COURSE, of two years, is designed for those who wish only a practical training in electrical engineering.

The AGRICULTURAL COURSES, of one year and of two years, are designed for farmers.

The WINTER COURSES IN AGRICULTURE, of six weeks each, are planned for farmers.

DEGREES.—The Latin-scientific course leads to the degree of Bachelor of Philosophy. The scientific, the agricultural, the chemical, the preparatory medical, and the pharmacy courses lead to the degree of Bachelor of Science; the civil engineering course leads to the degree of Bachelor of Civil Engineering; the mechanical and electrical engineering courses lead 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, bachelors receive the corresponding second degree.

Those who complete in a satisfactory manner the courses of one and two years in Agriculture, and the course of two years in Pharmacy receive certificates. Three years after graduation, the graduates of the course of two years in Pharmacy, on presentation of a satisfactory thesis and proof of professional work or further study receive the degree of Graduate in Pharmacy. The graduates of the long course may receive this degree one year after graduation on proof of professional work or further study. This will not prevent them from receiving the degree of Master of Pharmacy three years after graduation.

EXPLANATION OF TABLES.—The college year is divided into the fall term of sixteen weeks and the spring term of twenty weeks.

The quota of studies prescribed for each student is such as to require, for a minimum, seventeen hours, and for a maximum, twenty hours of class-room work each week, exclusive of declamations and themes. The tables are made so as to require, with the military work of three hours a fortnight, approximately twenty hours work each week. The numbers in the table shows the average number of hours a week given to each study. The

number 2.5 means three hours one week and two the next. Laboratory work and other exercises not requiring preparation count as half time—that is, two hours in the laboratory are counted as equivalent to one hour. The hours devoted to such studies are marked with a dagger (†) in the tables.

The capital letters and numerals preceding a study refer to the explanatory statements to be found on the pages given.

STUDIES OF THE FRESHMAN YEAR, ALL COURSES.

For Declamations and Themes see page 32; for Military Science see page 59.

FALL TERM—16 WEEKS.	Hours.	SPRING TERM—20 WEEKS.	Hours.
A1, Rhetoric, p. 31	2.5	A2, Rhetoric, p. 31	2.5
B1, French, p. 32 or B5, German, p. 33 or C1, Latin, p. 34	(See note) 5.0	B2, French, p. 33 or B6, German, p. 33 or C2, Latin, p. 34	(See note) 5.0
D1, General History, p. 35	1.0	D2, General History, p. 35	1.0
E1, Solid Geometry, p. 37, 8 w. E2, Algebra, p. 37, 8 w.	5.0	E3, Algebra, p. 37, 8 w. and E4, Trigonometry, p. 37, 12 w.	5.0
G1, Drawing, p. 40	†5.0	G2, Math. Drawing, p. 40, 7 w	†3.0
G2, Mathematical Drawing, p. 40, 3 w.	†3.0	G3, Mech. Drawing, p. 40, or K7, Botany, p. 49	†5.0
H1, General Chemistry, p. 41	2.5	H2, General Chemistry, p. 42	2.5

NOTE. Students in the Latin-Scientific Course take Latin, other students take French or German.

THE LATIN-SCIENTIFIC COURSE.

This course is planned for the benefit of those who seek the college for general rather than special training, with a view to fit themselves for business or further study. It is especially recommended to those who expect to become teachers. It differs from the usual classical course by omitting Greek, requiring a much more extensive course in modern languages, and permitting a very wide choice of elective work.

The required studies include courses in Latin, English, and modern languages; in mathematical and physical science; in natural science; in literature and civics. By a proper selection of elective studies, the student may make this course one in language, chemistry, natural science, mathematics, or physics. The entrance requirements in Latin are those of the best colleges. The courses in Latin offered to the college student will show a very wide range. The courses for the juniors and seniors are offered on alternate years.

Upon graduation, the student receives the degree of Bachelor of Philosophy; 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 Philosophy. In the selection of electives, a student may choose studies from those offered to earlier classes than his own.

THE LATIN-SCIENTIFIC COURSE.

For the Freshman Year see page 65; for Declamations and Themes see page 32; for Military Science see page 59.

SOPHOMORE YEAR.

FALL TERM—16 WEEKS.		SPRING TERM—20 WEEKS.	
Required.	Hours.	*Required.*	Hours.
B1, French, p. 32 or B5, German, p. 33	5.0	B2, French, p. 33 or B6, German, p. 33	5.0
F1, General Physics, p. 39	5.0	F2, General Physics, p. 39	2.5
Elective.		*Elective.*	
B1, French, p. 32	5.0	B2, French, p. 33	5.0
B5, German, p. 33	5.0	B6, German, p. 33	5.0
C3, Latin, p. 34	2.5	C4, Latin, p. 34	2.5
E5, Analytical Geometry, p. 37	2.5	F5, Laboratory Physics, p. 39	†5.0
E6, Analytical Geometry, p. 37	5.0	G3, Mechanical Drawing, p. 40	†5.0
Other electives like Scientific Course.		K7, Botany, p. 49	†5.0
		Other electives like Scientific Course.	

JUNIOR YEAR.

Required.		*Required.*	
A4, English Literature, p. 32	5.0	B2, French, p. 33 or B6, German, p. 33	5.0
B1, French, p. 32 or B5, German, p. 33	5.0	D7, Psychology, p. 35, 10 w. D9, Logic, p. 36, 10 w.	5.0
Elective.		*Elective.*	
B3, French, p. 33	2.5	B4, French, p. 33	2.5
B7, German, p. 33	2.5	B8, German, p. 33	2.5
C5, Latin, p. 34	2.5	C6, Latin, p. 34	2.5
C7, Latin, p. 35	2.5	C8, Latin, p. 35	2.5
D4, English History, p. 35	2.5	D5, American History, p. 35	2.0
Other electives like Scientific Course.		Other electives like Scientific Course.	

SENIOR YEAR.

Required.		*Required.*	
D11, Constitutional Law, p. 36,	5.0	D12, Political Economy, p. 36	5.0
Elective.		*Elective.*	
C5, Latin, p. 34	2.5	C6, Latin, p. 34	2.5
C7, Latin, p. 35	2.5	C8, Latin, p. 35	2.5
I11, Geology, p. 45	2.5	Other electives like Scientific Course.	
Other electives like Scientific Course.			

THE SCIENTIFIC COURSE.

This course is arranged for those who wish a broad general training based chiefly upon the study of science, modern languages, and history. It furnishes an admirable preparation for executive positions in banking, commercial, or manufacturing establishments, or for teaching in the mathematical or natural sciences, modern languages or political sciences.

For graduates of modern language or English courses in the high schools, it will serve the same general purposes that classical courses serve the graduates of the corresponding preparatory courses.

The work of the freshman year, consisting of English, modern languages, mathematics, drawing, and elementary courses in chemistry, history, and botany, is all required. After the freshman year a large part of the work—varying from one-third at the beginning of the sophomore year to three-fourths at the end of the senior year, is elective.

The required courses include analytical geometry, general physics, geology, French, German, English literature, English history, United States history, constitutional history, psychology, logic, and political economy.

The elective studies may be selected to give the student a comprehensive view of the mathematical or natural sciences, or to give a largely specialized course in modern languages, mathematics, physics, or natural science. The laboratories are all well equipped, and the library is rapidly growing.

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 the Freshman Year see page 65; for Declamations and Themes see page 32; for Military Science see page 59.

SOPHOMORE YEAR.

FALL TERM—16 WEEKS.

Required.	Hours.
B1, French, p. 32 / B5, German, p. 33	5.0
E5, Analyt. Geometry, p. 37, or / E6, Analytical Geometry, p. 37	2.5 / 5.0
F1, General Physics, p. 39	5.0
Elective.	
H3, Chemical Theory, p. 42	2.5
H13, Qualitative Analysis, p. 43	†5.0
I1, Cryptogamic Botany, p. 44	2.5
I2, Laboratory Botany, p. 44	†2.0

SPRING TERM—20 WEEKS.

Required.	Hours.
B2, French, p. 33 or / B6, German, p. 33	5.0
F2, General Physics, p. 39	2.5
F5, Laboratory Physics, p. 39	†5.0
Elective.	
A3, Anglo-Saxon, p. 31	2.5
D3, General History, p. 35	2.5
E7, Calculus, p. 37	5.0
E11, Advanced Algebra, p. 38	2.5
H13, Qualitative Analysis, p. 43	†5.0
K8, Plant Histology, p. 50, 10 w. / J13, Bacteriology, p. 48, 10 w.	†5.0

JUNIOR YEAR.

Required.	
A4, English Literature, p. 32	5.0
B3, French, p. 33 or / B7, German, p. 33	2.5
D4, English History, p. 35	2.5
Elective.	
B9, Spanish, p. 33	2.5
B11, Italian, p. 34	2.5
B13, Old French, p. 34	2.5
D6, Philosophy of History, p. 35.	2.5
D14, International Law, p. 36	2.5
E8, Calculus, p. 38	2.5
E12, Mod. Anal. Geometry, p. 38.	2.5
E14, Theory of Equations, p. 38	2.5
F7, Advanced Optics, p. 40	2.5
F8, Mathematical Physics, p. 40	2.5
F9, Advan. Lab. Physics, p. 40	†5.0
H13, Qualitative Analysis, p. 43,	†5.0
I5, Invertebrate Zoology, p. 44	2.5
I6, Laboratory Zoology, p. 45	†5.0
I8, Comp. Vert. Zoology, p. 45	3.5
N5, Analytic Mechanics, p. 55	5.0
O1, Electricity and Magnetism, p. 37	2.0
O3, Electrical Measurements and Testing, p. 58	†4.0

Required.	
B4, French, p. 33 or / B8, German, p. 33	2.5
D5, American History, p. 35	2.0
D7, Psychology, p. 35, 10 w. / D9, Logic, p. 36, 10 w.	5.0
Elective.	
A7, European Literature, p. 32	5.0
B10, Spanish, p. 33	2.5
B12, Italian, p. 34	2.5
B14, Old French, p. 34	2.5
E9, Descrip. Astronomy, p. 38	2.5
E10, Practical Astronomy, p. 38	2.5
E13, Adv. Integral Calculus, p. 38,	2.5
E15, Differential Equations, p. 39,	2.5
F10, Laboratory Physics, p. 40	†5.0
H11, Photography, p. 43	†2.0
H12, Mineralogy, p. 43	†2.0
H15, Elem. Quan. Analysis, p. 43,	†4.0
I7, Helminthology, p. 45	†4.0
I9, Laboratory Zoology, p. 45	†4.0
I10, Entomology, p. 45	2.5
N6, Analytic Mechanics, p. 55	5.0
O2, Electricity and Magnetism, p. 57	3.0

SENIOR YEAR.

Required.	
D11, Constitutional Law, p. 36	5.0
I11, Geology, p. 45	2.5
Elective.	
D10, Hist. of Philosophy, p. 36	2.5
E12, Mod. Anal. Geometry, p. 38.	2.5
E14, Theory of Equations, p. 38.	2.5
E16, Practical Astronomy, p. 39,	2.5

Required.	
D12, Political Economy, p. 36	5.0
Elective.	
D13, Municipal Law, p. 36	1.0
D15, Library Work, p. 36	†5.0
E13, Adv. Integral Calculus, p. 38,	2.5
E15, Differential Equations, p. 39,	2.5
E17, Practical Astronomy, p. 39,	5.0
H13, Qualitative Analysis, p. 43,	†5.0
I3, Advanced Physiology, p. 44	2.5
I4, Lab. Physiology, p. 45	†2.0

THE CHEMICAL COURSE.

This course is designed for those who wish to become professional chemists and analysts, chemists or managers in industries which require an extensive knowledge of chemistry, or teachers of chemistry. Especial attention is given to the preparation of students for the work of the agricultural experiment stations. 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.

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 and quantitative analysis and of metallurgy. The student is drilled in the use of chemical apparatus, in 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 references are made to German works.

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 65; for Declamations and Themes see page 32; for Military Science see page 59.

SOPHOMORE YEAR.

FALL TERM—16 WEEKS.	Hours.	SPRING TERM—20 WEEKS.	Hours.
B1, French, p. 32 or B5, German, p. 33	5.0	B 2, French, p. 33 or B6, German, p. 33	5.0
E5, Analytical Geometry, p. 37	2.5	F2, General Physics, p. 39	2.5
F1, General Physics, p. 39	5.0	F5, Laboratory Physics, p. 39	†5.0
H3, Chemical Theory, p. 42	2.5	H4, Inorganic Chemistry, p. 42	2.5
H13, Qualitative Analysis, p. 43	†8.0	H14, Adv. Qual. Analysis, p. 43	†12.0

JUNIOR YEAR.

A4, English Literature, p. 32	5.0	D7, Psychology, p. 35, 10 w. D9, Logic p. 36, 10 w.	5.0
B7, German, p. 33	2.5	H6, Organic Chemistry, p. 42	2.5
H5, Inorganic Chemistry, p. 42	2.5	H11, Photography, p. 43	†2.0
H8, Chemical Readings, p. 42	1.0	H12, Mineralogy, p. 43	†2.0
H17, Quan. Analysis, p. 43	†10.0	H18, Volumetric Analysis and Assaying, p. 43	†13.0
I5, Invertebrate Zoology, p. 44 (2.5 hrs.) or O1, Electricity and Magnetism, p. 57, (2 hrs.)	2.5	I10, Entomology, p. 45	2.5

SENIOR YEAR.

D11, Constitutional Law, p. 36	5.0	D12, Political Economy, p. 36	5.0
H9, Laboratory Processes, p. 42	2.5	K8, Plant Histology, p. 50, 10 w. J13, Bacteriology, p. 48, 10 w.	†5.0
H19, Agricul. Analysis, p. 43	†5.0	H10, Organic Chemicals, p. 43, 4 w. H21 Thesis Work, p. 44, 16 w.	†22.0
H20, Toxicology and Biological Analysis, p. 44	†12.0		
I11, Geology, p. 45	2.5		

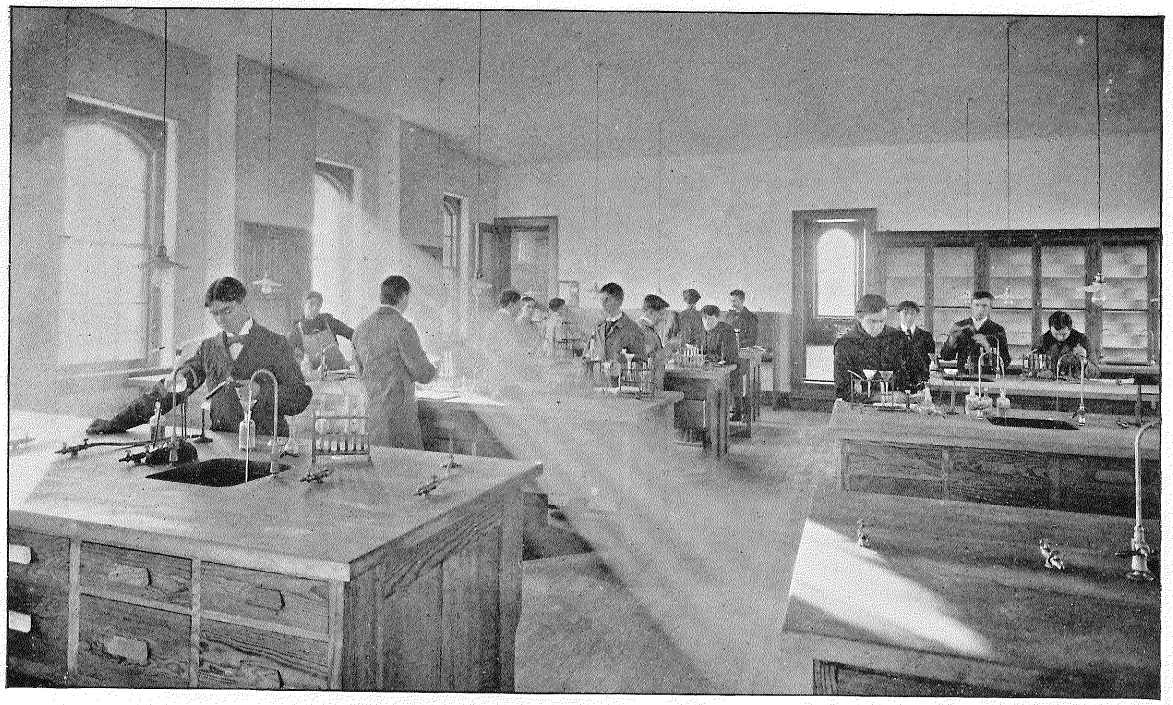
THE AGRICULTURAL COURSE.

This course is designed for those who wish to follow some branch of agriculture as a business, and for those who propose to become teachers or investigators in the sciences related to agriculture. It is broadly educational, particularly in the natural sciences and their relations to human needs and activities, and gives an admirable preliminary training for either business or professional life.

The instruction is arranged: first, to secure for the student that intellectual development which is a condition fundamental to the highest success in any calling, and second, to give him the necessary technical knowledge. The distinctive studies of this course are along technical lines, but the branches pertaining to general culture, to social, and civil relations, occupy an important place.

The theoretical instruction, especially that of the last two years, 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.

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 LABORATORY FOR QUALITATIVE CHEMISTRY.

THE AGRICULTURAL COURSE.

For the Freshman Year see page 65; for Declamations and Themes see page 32; for Military Science see page 59.

SOPHOMORE YEAR.

FALL TERM—16 WEEKS.	Hours.	SPRING TERM—20 WEEKS.	Hours.
B1, French, p. 32 or B5, German, p. 33.	5.0	B2, French, p. 33 or B6, German, p. 33	5.0
F1, General Physics, p. 39	5.0	F2, General Physics, p. 39	2.5
H3, Chemical Theory, p. 42	2.5	F5, Laboratory Physics, p. 39	†5.0
H13, Qualitative Analysis, p. 43	†6.0	H4, Inorganic Chemistry, p. 42	2.5
I1, Cryptogamic Botany, p. 44	2.5	H15, Elementary Quantitative Analysis, p. 43	†8.0
I2, Laboratory Botany, p. 44	†2.0	K8, Histology of Plants, p. 50 10 w. ; J13, Bacteriology, p. 48, 10 w	†5.0

JUNIOR YEAR.

B7, German, p. 33	2.5	D7, Psychology, p. 35, 10 w. ; D9, Logic, p. 36, 10 w.	5.0
D4, English History, p. 35	2.5	I10, Entomology, p. 45	2.5
H7, Organic Chemistry, p. 42	2.5	J2, Biological Chemistry, p. 46	5.0
H19, Agricultural Analysis, p. 44.	†6.0	J4, Agricultural Physics, p. 47 10 w. ; J5, Agricultural Engineering p. 47, 10 w.	2.5
I5, Invertebrate Zoology, p. 45	2.5	K1, Pomology, p. 49, 10 w. ; K2, Olericulture, p. 49, 10 w.	2.5
I6, Laboratory Zoology, p. 45	†5.0	K5, Laboratory Horticulture, p. 49	†4.0
J1, Biological Chemistry, p. 46	2.5		

SENIOR YEAR.

D11, Constitutional Law and History, p. 36	5.0	D12, Political Economy, p. 36	5.0
I8, Comparative Vertebrate Zoology, p. 45	3.5	I3, Advanced Physiology, p. 44	2.5
I11, Geology, p. 45	2.5	J7, Dairying, p. 47, 6 w. ; J8, Stock Breeding, p. 47, 8 w. ; J9, Poultry Industry, p. 47, 6w.	5.0
J3, Agricultural Chemistry, p. 46, 8 w. ; J6, Stock Feeding, p. 47, 8 w.	2.5	J11, Veterinary Science, p. 48	2.5
K3, Plant Variations, p. 49, 8 w. ; K4, Landscape Gardening, p. 49, 8 w.	2.5	J12, Dissecting, p. 48, 6 w. ; J10, Dairy Practice, p. 48, 14 w.	†7.0
K6, Laboratory Horticulture, p. 49	†5.0		

THE PREPARATORY MEDICAL COURSE.

This course is arranged to meet the needs of those students who propose to become physicians, but offers a very desirable training for teaching or investigation, to those who are interested in the biological sciences.

The course, outside of certain general subjects, including mathematics, language, and philosophy, consists mainly of two lines of study, chemical and biological.

The chemical studies, general and special, are continued for three and a half years, and include, as class room work, advanced inorganic and organic chemistry, and biological chemistry, and as laboratory work, qualitative and quantitative analysis, toxicology, and testing of drugs.

The biological studies begin in the freshman year and continue throughout the course, embracing such subjects as botany, both phænogamic and cryptogamic, invertebrate zoology, comparative vertebrate zoology, human anatomy, advanced physiology and practical bacteriology, plant and animal histology.

Important features of the course, as related to its special objects are: a study of animal parasites, particularly those affecting the human subject; a free use of the microscope in studying vegetable and animal tissues; experience in identifying and cultivating pathogenic organisms; a thorough consideration of the chemistry of foods, of the animal body, and of digestion and metabolism. Students graduated in this course are received into medical schools without examination, and are given credit for the work of the first year by the best schools.

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 PREPARATORY MEDICAL COURSE.

For the Freshman Year see page 65; for Declamations and Themes see page 32; for Military Science see page 59.

SOPHOMORE YEAR.

FALL TERM—16 WEEKS.

	Hours.
B1, French, p. 32 or B5, German, p. 33	5.0
F1, General Physics, p. 39	5.0
H3, Chemical Theory, p. 42	2.5
H13, Qualitative Analysis, p. 43	†6.0
I1, Cryptogamic Botany, p. 44	2.5
I2, Laboratory Botany, p. 44	†2.0

SPRING TERM—20 WEEKS.

	Hours.
B2, French, p. 33 or B6, German, p. 33	5.0
F2, General Physics, p. 39	2.5
F5, Laboratory Physics, p. 39	†5.0
H4, Inorganic Chemistry, p. 42	2.5
H14, Advanced Qualitative Analysis, p. 43	†8.0
K8, Histology of Plants, p. 50, 10 w.	†5.0
J13, Bacteriology, p. 48, 10 w.	

JUNIOR YEAR.

B7, German, p. 33	2.5
D4, English History, p. 35	2.5
H7, Organic Chemistry, p. 42	2.5
H16, Quantitative Analysis, p. 43	†6.0
I5, Invertebrate Zoology, p. 44	2.5
I6, Laboratory Zoology, p. 45	†5.0
J1, Biological Chemistry, p. 46	2.5
D7, Psychology, p. 35, 10 w. / D9, Logic, p. 36, 10 w.	5.0
H20, Toxicology and Biological Analysis, p. 44	†12.0
I7, Helminthology, p. 45	†4.0
J2, Biological Chemistry, p. 46	5.0

SENIOR YEAR.

D11, Constitutional Law and History, p. 36	5.0
I8, Comparative Vertebrate Zoology, p. 45	3.5
I11, Geology, p. 45	2.5
L3, Laboratory Pharmacy, p. 50	†10.0
L7, Materia Medica, p. 51	3.0
D12, Political Economy, p. 36	5.0
I3, Advanced Physiology, p. 44	2.5
I4, Laboratory Physiology, p. 45	†2.0
I12, Human Anatomy, p. 46	2.5
J11, Veterinary Science, p. 48	2.5
J14, Animal Histology, p. 48, 10 w. / J15, Laboratory Bacteriology, p. 48, 10 w.	†10.0

THE PHARMACY COURSE.

This course is offered in response to a demand for a thorough training, both general and technical, for those who are to become pharmacists. It aims to combine a broad general culture with thorough preparation along its special lines, with the design of affording the intellectual development necessary for the well rounded professional or business man. To this end, it includes the same instruction in modern languages, civics, and the sciences, offered in other college courses.

Instruction in pharmaceutical studies is given by means of lectures, recitations, and tests, supplemented by work in the laboratories of chemistry, and pharmacy, and embraces qualitative, quantitative, and volumetric analysis, toxicology, and bacteriology, prescriptions, and the preparation of pharmaceutical compounds, and original investigations.

The library contains valuable reference literature in chemistry, and pharmacy, and the best chemical and pharmaceutical journals are on file in the reading room.

Upon graduation the student receives the degree of Bachelor of Science; one year later, on proof of professional work or further study, he may receive the degree of Graduate in Pharmacy, if he desires it; two 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 PHARMACY COURSE.

For the Freshman Year see page 65; for Declamations and Themes see page 32; for Military Science see page 59.

SOPHOMORE YEAR.

FALL TERM—16 WEEKS.	Hours.	SPRING TERM—20 WEEKS.	Hours.
B1, French, p. 32 or B5, German, p. 33	5.0	B2, French, p. 33, or B6, German, p. 33	5.0
F1, General Physics, p. 39	5.0	F2, General Physics, p. 39	2.5
H3, Chemical Theory, p. 42	2.5	F5, Laboratory Physics, p. 39	†5.0
H13, Qualitative Analysis, p. 43	†8.0	H4, Inorganic Chemistry, p. 42	2.5
I1, Cryptogamic Botany, p. 44	2.5	H14, Advanced Qualitative Analysis, p. 43	†8.0
I2, Laboratory Botany, p. 44	†2.0	K8, Histology of Plants, p. 50, 10 w.	†5.0
		J13, Bacteriology, p. 48, 10 w.	

JUNIOR YEAR.

B7, German, p. 33	2.5	D7, Psychology, p. 35, 10 w. D9, Logic, p. 36, 10 w.	5.0
H5, Inorganic Chemistry, p. 42	2.5	H6, Organic Chemistry, p. 42	2.5
H8, Chemical Readings, p. 42	1.0	I3, Advanced Physiology, p. 44	2.5
H16, Quantitative Analysis, p. 43.	†10.0	J2, Biological Chemistry, p. 46	5.0
I11, Geology, p. 45	2.5	L6, Organic Pharmacognosy, p. 51	4.0
J1, Biological Chemistry, p. 46	2.5		
L5, Inorganic Pharmacognosy, p. 51	2.5		

SENIOR YEAR.

D11, Constitutional Law and History, p. 36	5.0	D12, Political Economy, p. 36	5.0
L2, Pharmacy, p. 50	5.0	L4, Pharmacopœia and Prescriptions, p. 50	3.0
L3, Laboratory Pharmacy, p. 50.	†10.0	L8, Thesis Work, p. 51	†10.0
L7, Materia Medica, p. 51	3.0	H20, Toxicology and Biological Analysis, p. 42, 10 w. J15, Laboratory Bacteriology, p. 48, 10 w	†10.0

THE CIVIL ENGINEERING COURSE.

The object of this course is to give the student a knowledge of mathematics, mechanics, and drawing, experience in the care and use of the ordinary engineering instruments, and a drill in the application of mathematical principles and rules, with a view to fitting him 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 not only technical instruction, but also the basis of a liberal education. Especial attention is given to English, modern languages, and economics.

The methods of instruction are recitations, lectures, original problems, work in the testing laboratories, field practice, and designing, including the making of original designs and the preparation of the necessary drawings. Especial effort is made to acquaint the student with the best engineering structures, and the standard works in engineering literature.

The engineering building is well equipped and contains recitation rooms, designing rooms, testing laboratories, drawing rooms, and instrument rooms.

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 65; for Declamations and Themes see page 32; for Military Science see page 59.

SOPHOMORE YEAR.

FALL TERM—16 WEEKS.	Hours.	SPRING TERM—20 WEEKS.	Hours.
B3, French, p. 33 or B7, German, p. 33	2.5	B4, French, p. 33 or B8, German, p. 33	2.5
E6, Analytical Geometry, p. 37	5.0	E7, Calculus, p. 37	5.0
F1, General Physics, p. 39	5.0	F2, General Physics, p. 39	2.5
G4, Mechanical Drawing, p. 41	†7.0	F5, Laboratory Physics, p. 39	†5.0
G6, Descriptive Geometry, p. 41,	2.5	G7, Descriptive Geometry, p. 41	1.5
		M1, Plane Surveying, p. 51, 10 w. 3 h., and 10 w. 2 h.	2.5
		M2, Field Work in Surveying, p. 51, 10 w. †3 h, and 10 w. †5h.	†4.0

JUNIOR YEAR.

D4, English History, p. 35	2.5	E13, Advanced Integral Calculus, p. 38 or E15, Differential Equations, p. 39 or E9, Descriptive Astronomy, p. 38	2.5
E8, Calculus, p. 38	2.5		
E12, Modern Analytical Geometry, p. 38 or E14, Theory of Equations, p. 38 or I11, Geology, p. 45	2.5	E10, Practical Astronomy, p. 38	2.5
M3, Railroad Engineering, p. 52, 12 w M5, Highway Engineering, p. 52, 4 w	3.5	G5, General Drawing, p. 41, 12 w M10, Higher Surveying, p. 53, 8 w	†10.0
M4, Railroad Work, p. 52	†5.0	G8, Stereotomy, p. 41	†3.0
M6, Mechanics, p. 52	5.0	H11, Photography, p. 43	†2.0
		H12, Mineralogy, p. 43	†2.0
		M7, Mechanics, p. 52	5.0

SENIOR YEAR.

D11, Constitutional Law and History, p. 36	5.0	D7, Psychology, p. 35, 10 w... or D9, Logic, p. 36, 10 w	5.0
E12, Modern Analytical Geometry, p. 38 or E14, Theory of Equations, p. 38 or M9, Sanitary Engineering, p. 52.	2.5	D8, Psychology, p. 35 E13, Advanced Integral Calculus, p. 38 or E15, Differential Equations, p. 39	2.5
M8, Graphic Statics, p. 52.	2.5		
M11, Hydraulics, p. 53, 7 w M13, Mechanics of Materials, p. 53, 9 w	5.0	D12, Political Economy, p. 36	5.0
M12, Hydraulics, Field Work, p. 53, 8 w M15, Designing, p. 54, 8 w	†7.0	M14, Foundations, Masonry Construction & Cements, p. 53,	3.5
		M16, Designing, p. 54	†12.0

THE MECHANICAL ENGINEERING COURSE.

This course is designed to give such a training in mathematics, mechanics, the principles of mechanism, in 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, modern languages, philosophy, and history. The technical courses include the geometry of machinery, gearing, with problems and practice, transmission of motion and power, bolts, cams, couplings and links, the study and designing of the 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 hydro-mechanics. The methods of instruction include lectures, recitations, practice in the various branches of shop-work, the solution of numerous problems, the testing of theoretical results by comparison with modern machinery, the inspection of important plants, etc.

The department shares Wingate Hall with the departments of civil engineering, and physics. The machine shop is equipped with iron working and wood working machinery of the most approved forms.

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 65; for Declamations and Themes see page 32; for Military Science see page 59.

SOPHOMORE YEAR.

FALL TERM—16 WEEKS.	Hours.	SPRING TERM—20 WEEKS.	Hours.
B3, French, p. 33 or B7, German, p. 33	2.5	B4, French, p. 33 or B8, German, p. 33	2.5
E6, Analytical Geometry, p. 37	5.0	E7, Calculus, p. 37	5.0
F1, General Physics, p. 39	5.0	F2, General Physics, p. 39	2.5
G6, Descriptive Geometry, p. 41,	2.5	F5, Laboratory Physics, p. 39	†5.0
N3, Carpentry, p. 54	†6.0	G7, Descriptive Geometry, p. 41	1.5
		N 4, Forge Work, p. 54	†8.0

JUNIOR YEAR.

D4, English History, p. 35	2.5	E13, Advanced Integral Calculus, p. 38 or E15, Differential Equations, p. 39 or N16, Steam Boilers, p. 55	2.5
E8, Calculus, p. 38	2.5		
E12, Modern Analytic Geometry, p. 38, or E14, Theory of Equations, p. 38, or N9, Kinematics, p. 55, (†5 h.)	2.5	N1, Machine Design, p. 54	†7.0
		N6, Analytic Mechanics, p. 55 8 w. N7, Applied Mechanics, p. 55, 12 w.	5.0
N5, Analytic Mechanics, p. 55	5.0		
N13, Machine Work, p. 56	†4.0	N13, Machine Work, p. 56	†10.0
N13, Machine Work, p. 56 or O3, Electrical Measurements and Testing, p. 59	†4.0	N15, Steam Boilers, p. 56	2.5
O1, Electricity and Magnetism, p. 58	2.0		

SENIOR YEAR.

D11, Constitutional Law and History, p. 36	5.0	D7, Psychology, p. 35, 10 w. or D9, Logic, p. 36, 10 w.,	5.0
E12, Modern Analytic Geometry, p. 38, or E14, Theory of Equations, p. 38, or I11, Geology, p. 45,	2.5	D8, Psychology, p. 35 and E13, Advanced Integral Calculus, p. 38 or E 15, Differential Equations, p. 39	2.5
N11, Link and Valve Motion, p. 55	4.0	D12, Political Economy, p. 36	5.0
N7, Applied Mechanics, p. 56	2.5	N18, Testing, p. 57	2.0
N19, Steam Engine Design, p. 57	†10.0	N14, Hydro-Mechanics, p. 56	1.5
		N20, Steam Boiler Designing, p. 57, 10 w., N21, Thesis Work, p. 57, 10 w.,	†10.0

THE ELECTRICAL ENGINEERING COURSE.

This course is designed to give the student the general and special training which shall fit him to meet successfully the problems that confront the practical electrical engineer. It is identical with the course in Mechanical Engineering for the first two years. During the last two years the student devotes his time about equally to mechanical and electrical work. He gets a knowledge of steam engineering, boiler management, mechanics and kindred subjects, and at the same time becomes familiar with the various branches of electrical engineering. The work consists of lectures, recitations, designing and drafting, laboratory practice, and plant testing. This course is in the charge of the professor of physics.

The lecture-room, drafting-room, and junior laboratory are located in Wingate Hall. The electric lighting plant and dynamo laboratory occupy a new building adjoining the Shop. The electrical equipment includes a 30 K. W., 500 light, direct current, multipolar generator, built by the Eddy Electric Manufacturing Company, a 250 light, bipolar direct current generator, built by the Belknap Motor Company, and several smaller machines, including a Brush dynamo, an Edison type machine, a Belknap motor, and a small alternator. Several new ammeters, voltmeters, and other testing machines have been added during the ast year. The equipment is sufficient to give the student a thorough preparation for the work of designing, constructing, testing and operating the various machines and instruments found in an electric plant.

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 or Electrical Engineer, as his professional work may make proper.

THE ELECTRICAL ENGINEERING COURSE.

For the Freshman Year see page 65; for Declamations and Themes see page 32; for Military Science see page 59.

SOPHOMORE YEAR.

FALL TERM—16 WEEKS.	Hours.	SPRING TERM—20 WEEKS.	Hours.
B3, French, p. 33 or B7, German, p. 33	2.5	B4, French, p. 33, or B8, German, p. 33.	2.5
E6, Analytical Geometry, p. 37	5.0	E7, Calculus, p. 37.	5.0
F1, General Physics, p. 39	5.0	F2, General Physics, p. 39	2.5
G6, Descriptive Geometry, p. 41	2.5	F5, Laboratory Physics, p. 39	†5.0
N3, Carpentry, p. 54	†6.0	G7, Descriptive Geometry, p. 41,	1.5
		N4, Forge Work, p. 54	†8.0

JUNIOR YEAR.

D4, English History, p. 35	2 5	E13, Advanced Integral Calculus, p. 38, or E15, Differential Equations, p. 39, or N17, Steam Boilers, p. 56	2.5
E8, Calculus, p. 38	2.5		
E12, Modern Analytic Geometry, p. 38, or E14, Theory of Equations, p. 38, or N8, Kinematics, p. 55, (†3h)	2.5	N2, Machine Design, p. 54	†3.5
		N6, Analytic Mechanics, p. 55 8 w. N7, Applied Mechanics, p. 55 12 w	5.0
N5, Analytic Mechanics, p. 55	5.0		
N11, Machine Work, p. 55	†6.0	N13, Machine Work, p. 56	†6.0
O1, Electricity and Magnetism, p. 57	2.0	O2, Electricity and Magnetism, p. 57	3.0
O3, Electrical Measurements and Testing, p. 58	†4.0	G9, Detail Drawing, p. 41	†4.0

SENIOR YEAR.

D11, Constitutional Law and History, p. 36	5.0	D7, Psychology, p. 35, 10 w, D9, Logic, p. 36, 10 w., or D8, Psychology, p. 35, and	or 5.0
E12, Modern Analytic Geometry, p. 38, or E14, Theory of Equations, p. 38, or I11, Geology, p. 45	2.5	E13, Advanced Integral Calculus, p. 38, or E15, Differential Equations, p. 39	2.5
N12, Link and Valve Motion, p. 56, 8 w., and O8, Laboratory Electricity, p. 58, 8 w., †8 hours	4.0	D12, Political Economy, p. 36	5.0
		O5, Electrical Engineering, p. 58, 10 w. O9, Theoretical Electricity, p. 58, 10 w	2.5
O4, Electrical Machinery, p. 58,	2.0		
O6, Electrical Design, p. 58	†6.0	O7, Electrical Design, p. 58	†5.0
O10, Power Stations, p. 59, (2 hs.) or O11, Shop Work, p. 59 (4 h.)	2.0	O12, Thesis Work, p. 59	†6.0

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. They are intended to give the greatest amount of available and directly useful knowledge that can be acquired in the time allowed. To adapt them to the varying conditions of preparation and of time that can be given, two courses are offered, one extending through two college years, the other through one 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. The entrance examination for these courses is the same as for the full four years course, with the exception that no geometry is required and no algebra beyond simple equations of the first degree. Applicants must be at least fifteen years of age.

The annual expenses are the same as those of students in the four years courses, as stated in the article on expenses. No charge is made for tuition or rooms.

These courses, including the work in agriculture, horticulture, animal industry and veterinary science, are in the general charge of the professor of agriculture.

Students who complete these courses in a satisfactory manner, receive certificates.

THE TWO YEARS COURSE IN PHARMACY.

This course is designed for those who, for lack of time or other reasons, are unable to take the four years course. The more general educational studies of the full course are omitted, but it is the aim to offer as broad a range of subjects as can be undertaken without sacrifice of thoroughness, in the technical work. The course corresponds, in general, to the usual full course of the pharmaceutical colleges. The work required of the student will occupy his whole time during the college years of nine months, and must exclude any practical work in drug stores, during term time.

Those who intend to fit themselves for pharmaceutical work are urged to consider carefully the superior advantages of the long course. In addition to its commercial advantages, the long course offers still greater attractions in those broadening and developing influences, which are the most important results of the best education. The growing importance of biological, sanitary, and medical science, the pharmacist's relation to them, and his influential position, make it increasingly necessary to his success, that he be not only a well trained man in the techinal branches, but an educated man in the broadest sense.

Students who complete this course in a satisfactory manner receive a certificate. Three years later, on presentation of a satisfactory thesis and proof of professional work, or further study, they receive the degree of Graduate in Pharmacy.

THE SHORT COURSE IN PHARMACY.

For Declamations and Themes see page 32; for Military Science see page 59.

FIRST YEAR.

FALL TERM—16 WEEKS.	Hours.	SPRING TERM—20 WEEKS.	Hours.
F3, Elementary Physics, p. 39 ...	2.5	F4, Elementary Physics, p. 39....	2.5
H1, General Chemistry, p. 41.....	2.5	H2, General Chemistry, p. 42,....	2.5
H13, Qualitative Analysis, p. 43,.	†10.0	H15, Elementary Quantitative Analysis, p. 43, 10 w.	†13.0
L1, Pharmacy, p. 50.....	5.0	H18, Volumetric Analysis and Assaying, p. 43, 10 w.	
L5, Inorganic Pharmacognosy, p. 51.....	2.5	K7, General Botany, p. 49.....	†5.0
		L6, Organic Pharmacognosy, p. 51.....	4.0

SECOND YEAR.

H7, Organic Chemistry, p. 42	2.5	H20, Toxicology and Biological Analysis, p. 44, 10 w.	†13.0
I2, Laboratory Botany, p. 44.....	†2.0	J13, Bacteriology, p. 48 (10 w. †5h)	
J1, Biological Chemistry, p. 46...	2.5	J2, Biological Chemistry, p. 46...	5.0
L2, Pharmacy, p. 50	5.0	L4, Pharmacopœia and Prescriptions, p. 50.....	3.0
L3. Laboratory Pharmacy, p. 50.	†10.0	L8, Thesis Work, p. 51	†10.0
L7, Materia Medica, p. 51	3.0		

SPECIAL COURSES.

No short courses have been arranged in other departments than those mentioned above, but special students are received in any department upon giving satisfactory evidence that they are fitted to pursue a special course with profit. The studies must usually be selected from those announced in the catalogue. Special courses, essentially the same as a regular course laid down in this catalogue, will not be allowed. If more students desire to take any study than can be accommodated, preference will be given to those in the regular and longer courses.

The expenses will be the same as those of students in the full courses. No charge will be made for tuition or rooms.

WINTER COURSES IN AGRICULTURE.

Three winter courses are offered, designed for farmers or young men expecting to become farmers, who are unable to devote a longer time to study. These courses are under the direction of the Professor of Agriculture, to whom inquiries should be addressed. A special circular is issued each year in the month of October.

These courses begin on the first Tuesday of January and continue six weeks. They are made up of lectures and laboratory work arranged in three groups. A student can attend the lectures of one course only. Each course consists of two terms of six weeks. The first year is introductory to the second, but is complete in itself.

The instruction includes lectures and recitations on agricultural chemistry, animal industry, dairy husbandry, horticulture, veterinary science, agricultural engineering, entomology, and business law, combined with practical work in the barn, dairy and forcing houses.

It is not claimed that anything like a complete training in agricultural science can be given in six weeks, or in twelve, but the fundamental principles may be discussed briefly. The student may obtain an understanding of the ways in which science helps agriculture, and may gain a knowledge of principles which will prove of great aid in using agricultural literature, and an incentive to home reading and study.

The General Course.

This course is designed to give a variety of information useful to the general farmer, without giving special attention to one branch of business. It is arranged for two years' study.

First Winter.—Plant and animal nutrition, 20 hours. Commercial fertilizers and farm manures, 10 hours. Breeds, breeding and feeding, 20 hours. Farm machinery, 10 hours. Veterinary science, 15 hours. Bacteriology, 5 hours. Injurious insects, 15 hours. Injurious fungi, 20 hours. Crops and crop production 5 hours. Farm gardening, 25 hours. Dairying, 40 hours. Farm accounts, 10 hours.

Second Winter.—Breeds, breeding and feeding, 25 hours. Farm machinery, 10 hours. Farm drainage, 20 hours. Carpentry, 15 hours. Blacksmithing, 15 hours. Agricultural mechanics, 20 hours. Veterinary science, 20 hours. Injurious insects, 20 hours. Crops and crop production, 5 hours. Economic botany, 30 hours. Business law, 15 hours.

Course in Dairying.

This course is designed for those who are to make dairying a specialty or for those who propose to become expert butter makers or cheese makers.

A certificate of proficiency to those students who pursue the full course, and serve for two seasons in a satisfactory manner in a butter or cheese factory will be granted. The course is arranged for two years' study.

FIRST WINTER. Plant and animal nutrition, 20 hours. Diseases of domestic animals, 20 hours. Milk, butter and cheese, 80 hours. Cows, breeding, handling and judging, 55 hours. Buildings and furnishings, barns, creameries, etc., 10 hours. Accounts, 10 hours.

SECOND WINTER. Milk, butter and cheese, 80 hours. Bacteria, effects upon dairy products, 20 hours. Veterinary science, 20 hours. Boiler and engine, 10 hours. Business law, 15 hours. Carpentry, 15 hours. Cows, feeding, 35 hours.

COURSE IN HORTICULTURE.

This course is designed for those who expect to give special attention to fruit growing, market gardening, or floriculture. It is arranged for two years' study.

FIRST WINTER. Plant and animal nutrition, 20 hours. Commercial fertilizers and farm manures, 20 hours. Injurious insects, 35 hours. Injurious fungi, 20 hours. Fruit culture, 45 hours. Vegetable gardening, 45 hours.

SECOND WINTER. Farm machinery, 10 hours. Farm drainage, 20 hours. Carpentry, 15 hours. Agricultural mechanics, 20 hours. Economic botany, 30 hours. Ornamental gardening, 30 hours. Green house construction and management, 45 hours. Business law, 15 hours. Accounts, 10 hours.

THE SUMMER SCHOOL.

A summer school, especially intended for teachers and students preparing for college, will be maintained for three weeks, beginning in July, under the joint control of Hon. W. W. Stetson, the State Superintendent of Schools, and of the President of the College.

Instruction will be given in chemistry, mathematics, physics, geology, botany, zoology, English, civics, pedagogy and child

study, domestic economy and methods of teaching. There will be recitations and lecture courses in each subject, and laboratory courses in each, except English, civics, and pedagogy.

The evenings will be given up to lectures, concerts, conferences, and social entertainments. Saturdays will be devoted to field work, excursions, and amusements. Tuition will be free, but each laboratory student will be charged for materials and apparatus. Inquiries may be addressed to the President of the College, at Orono, or to the Superintendent of Schools, at Augusta.

A special circular will be issued in March, 1897, which may be obtained free of charge, by applying to the President of the College.

THE LIBRARY AND READING ROOM.

The library on the first floor of Coburn Hall, contains over nine thousand bound volumes, and about three thousand pamphlets. The growth of the library is about one thousand volumes annually.

A large and convenient reading room adjoins the main room. About eighty of the most important literary and technical papers, magazines, and reviews, both American and foreign, are kept on file.

The library is open for consultation and circulation of books eight hours daily during the week. Students are allowed direct access to the shelves. Students may have two books each at a time, to be kept two weeks, when they may be renewed, unless some one else has put in an application for them. There is a fine of two cents a day for books kept over time. If additional books are needed for special work they can be had on application to the librarian.

A reading room located on the first floor of Oak Hall, under the management of the students, is provided with the principal daily and weekly newspapers.

THE MUSEUM AND HERBARIUM.

The museum is located in two stories of the wing of Coburn Hall. In the upper story are exhibited the mineral collection, geological specimens and plant models. The mineral cabinet embraces a general collection of three hundred species of the more common minerals which are arranged for study according to Dana's system. There is a fine collection of economic minerals, embracing the important ores useful in the arts and sciences, donated by the United States National Museum. The geological cabinet embraces a small collection of plant and animal fossils, and a collection of 250 specimens of the more important fragmental, crystalline, and volcanic rocks. The collection of Brendel plant models is assigned a special case.

On the lower floor are displayed the collections of vertebrate and invertebrate animals and a set of animal models. The invertebrates include working collections of sponges, hydroids, corals, echinoderms, vermes, mollusks, crustaceans, and insects, besides interesting native and exotic exhibition specimens of all the above groups. The vertebrates include the nucleus of a collection of State fishes, reptiles, birds, and mammals, besides a set of type exotic mammals. The collection of animal models embraces a human manikin, special models of the human eye, ear, and larynx, and models of an insect, leach, snail, fish, snake, and bird.

The herbarium consists of the original Maine Collection of about 500 species; the New Collection of Maine Plants of 800 species; the Blake Herbarium of 7,000 species, including phenogams and cryptogams; Ellis and Everhard's North American Fungi, comprising thirty-three centuries; Halsted's Lichens of New England; Underwood's Hepaticæ; Cummings and Seymour's North American Lichens; Cook's Illustrative Fungi; Collins' Algæ of the Maine Coast; a collection of illustrative cryptogams in boxes; Harvey's Weeds and Forage Plants of Maine of 300 species; Halsted's Weeds; a collection of grasses and forage plants of 400 species; a collection of United States woods prepared by the United States Department of Agriculture; a collection of seeds and fruits; numerous slides for the microscope.

THE AGRICULTURAL EXPERIMENT STATION.

The Agricultural Experiment Station of the Maine State College owes its existence to an act of Congress, 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.

The affairs of the station are considered by an advisory Council consisting 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 refers its results to the trustees for ratification. The station receives $15,000 annually from the general government.

The inspection of fertilizers, and the testing of the graduated glassware used in creameries, are intrusted to the station through its director, who is responsible for the execution of the public laws relating to these matters.

The publications of the station consist of annual reports and frequent short bulletins. The latter are intended to convey to farmers the results that relate to farm practice. The annual reports contain a fuller statement of the proceedings of the station, involving the technical language of science. These reports 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 departments. College exercises are omitted and all departments are thrown open to visitors. Especial effort is made to exhibit the facilities of the agricultural departments in the most

thorough manner. Special rates are obtained on the railroad for those who come from a distance. The attendance has ranged from twelve hundred to seventeen hundred persons. The programme includes informal addresses by members of the faculty 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. The experiments of the experiment station are explained by the investigators.

In the afternoon the students give an exhibition drill, and later a meeting is held in the chapel, at which 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. 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 superior usefulness and prompt performance of duties. As members of the community they are amenable to the law. The college recognizes its relation to the commonwealth as a part of the State government, and will not shield students from consequences of acts in violation of State laws.

The College Regulations.

The 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 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 the student is reported by assigning him 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, has an opportunity to make up his deficiency at the special examinations which are held at the beginning of each term, but if he fails to pass up in any study before it is again taken up in class, he is required to attend the recitations in this study.

Each student is given a report of his work shortly after the close of each term. Parents or guardians may obtain these reports from the Secretary upon application.

STUDENT EXPENSES.

Tuition is free to all students. Rooms in the Dormitory are free, but the number of rooms is limited.

Many students go through college for an annual expenditure of about $200, exclusive of the expense of clothing, traveling, and vacations, and very many earn a part of this sum, by vacation work. An estimate of the necessary annual expenses of a student may be made from the following table. It should be noticed that clothes, traveling, vacation, society and personal expenses are not included. These vary according to individual tastes and habits. The table is made up for students who room in the college dormitory, and board at the college Commons. The neces-

sary expenses of other students will be slightly higher. In all cases, a small additional allowance must be made for personal incidental expenses. The expenses of the first year are usually higher than those of later years.

STUDENT EXPENSES FOR ONE YEAR, OF TWO TERMS.

Term charges, 2 terms at $15.00,	$30.00
Text-books, about	15.00
Laboratory fees, average about,	8.00
Stationery, drawing instruments, etc., average about	5.00
Encampment,	5.00
Board, 34 weeks at $2.75,	93.50
Heat and light for one-half room, and general care of dormitory, about	15.00
Furniture, one-half net expense, average for four years,	6.25
Laundry, about,	15.00
Total,	$192.75

The college term charge, for all students, is $15.00. As the year is divided into two terms, the annual charge is $30.00. This charge covers the following items:—heat and light for public buildings, $7.50; military and physical culture, 50 cents; reading room, 50 cents; care and cleaning of recitation, and other public rooms, $4.00; incidentals, $2.50.

The cost of text-books will average almost exactly $15.00 a year for the course. These may be bought from the college librarian at cost, but must be paid for on delivery. The expense can be decreased by buying second hand books and selling them when used.

Students in the laboratories and the shops pay a small charge, intended to cover cost of materials and maintenance. These charges are as follows:—biology, per term, $1.00; chemistry, per term, about $3.00; bacteriology, per course, $3.00; physics, per course, $2.00; pharmacy, per term, about $3.50; mineralogy, $2.00; photography, $2.00; electrical engineering, per course, $2.50; shop, per course, $5.00. Students in elementary botany furnish their own instruments. Laboratory charges in the civil engineering course are very few, but students will have traveling

expenses in visiting engineering works which will be nearly equivalent to the laboratory expenses of other courses.

It is usual to spend one week of each year in camp, for military instruction. The expense is borne partly by the college and partly by the student. The expense per student, including board, is about $5.00.

The largest item of expense is for board. In the Commons, the college boarding house, each student pays his share of the cost, usually about $2.75 per week. Board may be obtained in clubs or private families at prices ranging from $3.00 to $3.25 per week.

Rooms in the dormitory are free, but students supply their own furniture, and are charged for their heat and light, for the lighting and care of the halls and public rooms of the dormitory, and for damages. This charge may be expected to be about $15.00 a year, per student, for two in a room. No student will be allowed to room in the dormitory whose conduct is in any way objectionable. Furnished rooms, with light and heat, may be obtained in the village for $1.50 a week if occupied by one person, or $2.00 a week if occupied by two persons.

The estimate for furniture is made on the assumption that two students will unite in furnishing a room, and that something will be realized from the sale of furniture upon graduation.

Students are charged for all damages done to college property or to that of other students.

Each student is required to supply himself with a military uniform; but this should not be considered as involving an additional expense, since it will take the place of another suit, and can be purchased at a price considerably below that ordinarily charged for a civilian suit of equal quality. The suit and cost are fully described on page 109.

Each student is required to deposit with the Treasurer, upon entering college, a bond, with two good names as sureties, in the amount of $150.00 to cover college bills. Blanks on which bonds should be made out will be furnished by the college, on application. Those who keep a sufficient deposit with the Treasurer to cover the bills of one term will not be required to furnish a bond. No student will be graduated who is in debt to the college.

COLLEGE ORGANIZATIONS.

FRATERNITIES.—The following college fraternities are represented in the college: The Q. T. V. Fraternity, The B. Θ. Π. Fraternity, The K. Σ. Fraternity, The A. T. Ω. Fraternity, The O. E. H. Π. Fraternity, The Δ. P. Fraternity.

COLLEGE ASSOCIATIONS.—The Young Men's Christian Association, The Athletic Association, The Maine State College Publishing Association, The Maine State College Electrical Society, The Reading Room Association, The College Press Club, The College Band, The College Orchestra, the Photographic Society, the Glee Club, and The Maine State College Scientific Society.

THE YOUNG MEN'S CHRISTIAN ASSOCIATION.—The Young Men's Christian Association, composed of students, has for its object the promotion of Christian fellowship and aggressive Christian work. Among its members are leaders in the athletic, social, and intellectual life of the college.

THE ALUMNI ASSOCIATIONS.—The following associations of the alumni have been organized: THE WEST MAINE ASSOCIATION—S. W. Bates, Portland, *President;* THE NORTH MAINE ASSOCIATION—Harvey B. Thayer, *President;* N. H. Martin, Fort Fairfield, *Secretary;* THE BOSTON ASSOCIATION—L. C. Southard, 27 School Street, Boston, Mass., *President;* Ralph K. Jones, Hotel Oxford, Boston, Mass., *Secretary;* THE NEW YORK ASSOCIATION—A. J. Caldwell, 86 Liberty Street, New York, *President;* L. W. Riggs, 414 East 26th Street, New York, *Secretary;* THE WASHINGTON (D. C.) ASSOCIATION—F. Lamson-Scribner, U. S. Department of Agriculture, *President;* Edward H. Kelly, *Secretary;* THE PACIFIC ASSOCIATION—A. W. Saunders, Pullman, Washington, *President;* Hugo Clark, Seattle, Washington, *Secretary.*

THE GENERAL ALUMNI ASSOCIATION.

CHARLES S. BICKFORD, PRESIDENT, *Belfast.*
D. WILDER COLBY, RECORDING SECRETARY, *Orono.*
FRANK DAMON, CORRESPONDING SECRETARY, *Bangor.*
E. H. DAKIN, TREASURER, *Bangor.*
L. H. MERRILL, NECROLOGIST, *Orono.*

CLASS SECRETARIES.

E. J. HASKELL,.....Class of 1872,..... *Westbrook.*
J. M. OAK,.....Class of 1873, ... *Bangor.*
J. I. GURNEY,.....Class of 1874,..... *Dorchester, Mass.*
E. F. HITCHINGS, ...Class of 1875, ... *Bucksport.*
E. M. BLANDING,....Class of 1876, ... *Bangor.*
S. W. GOULD,.....Class of 1877, ... *Skowhegan.*
JOHN LOCK, JR.,....Class of 1878, ... *Portland.*
F. E. KIDDER, ...Class of 1879,..... *1362 California St. [Denver, Col.*
A. H. BROWN, ...Class of 1880,..... *Oldtown.*
H. M. PLAISTED,....Class of 1881,.... *724 Commercial Building. [St. Louis, Mo.*
W. R. HOWARD, ...Class of 1882, ... *Belfast.*
L. W. TAYLOR,.....Class of 1883, ... *Calais.*
G. H. ALLEN, ...Class of 1884, ... *Portland.*
J. N. HART, ...Class of 1885,..... *Orono.*
R. K. JONES,.....Class of 1886,..*Hotel Oxford, Boston, Mass.*
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, ...*Everett, Mass.*
G. F. ATHERTON,....Class of 1892,..... *Cape Elizabeth.*
G. F. ROWE, ...Class of 1893, ... *Bangor.*
J. M. KIMBALL, ...Class of 1894, ... *Bangor.*
FRANK DAMON,.....Class of 1895, ... *Bangor.*
PAUL D. SARGENT,..Class of 1896,..... *Machias.*

THE COLLEGE PUBLICATIONS.

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 SHORT CATALOGUE OF THE MAINE STATE COLLEGE.—This is an abbreviated form of the catalogue, issued annually, for wide distribution.

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 COLLEGE CIRCULARS.—These are small occasional pamphlets, issued for special purposes.

THE EXPERIMENT STATION BULLETINS.—These are popular accounts of the results of station work which relate directly to farm practice.

THE CADET.—This is an illustrated monthly magazine published during the college year by an association of the students.

THE PRISM.—This is an elaborately illustrated annual published by the Junior Class.

THE ANNUAL REPORT OF THE EXPERIMENT STATION.—This is a part of the Annual Report described above.

THE COMMENCEMENT.

The Commencement exercises of 1896 were as follows:—

Saturday, June 13: Junior Exhibition.

Sunday, June 14: Baccalaureate Sermon, by President A. W. Harris.

Monday, June 15: College Convocation, including reports of departments and student enterprises, and the awarding of prizes; Class Day Exercises.

Tuesday, June 16: Exhibition Drill; Receptions by the Fraternities; Reception by the President.

Wednesday, June 17: Commencement Exercises; Commencement Dinner; Meeting of the Alumni Association; Commencement Concert.

CERTIFICATES AND DEGREES.

Certificates were presented to the following persons upon completing the Course in Library Economy, in a satisfactory manner:

Carrie Smythe Green, Bangor.
Rena Pearl Vinall, Orono.

The first degree was conferred on the following persons:

Harry Clifford Farrell, B. M. E., Machias.
Roy Lynde Fernald, B. C. E., Winterport.
Edward Everett Gibbs, B. C. E., Bridgton.
Everett Gray Glidden, B. M. E., Augusta.
Frederic Andrews Hobbs, B. S., Alfred.
George Wesley Jeffrey, B. C. E., North Monmouth.
Elmer Elwood Kidder, B. C. E., Waterville.
Ralph Barton Manter, B. C. E., Milo.
Frank Leonard Marston, B. C. E., Bangor.
Herman Stephen Martin, B. C. E., Foxcroft.
Herbert Lester Niles, B. C. E., Levant.
Warren Robbins Page, B. C. E., Newburg Village.
Perley Burnham Palmer, B. C. E., South Bridgton.
Frank Perley Pride, B. S. (in Chemistry), Westbrook.
Lore Alford Rogers, B. S. (in Agriculture), Patten.
Paul Dudley Sargent, B. C. E., Machias.
Erastus Roland Simpson, B. M. E., Brunswick.

John Alvah Starr, B. C. E., Orland.
Stanley John Steward, B. M. E., Foxcroft.
Gilbert Tolman, B. M. E. (in Electricity), Milo.
Perley Walker, B. M. E., North Anson.
Charles Partridge Weston, B. C. E., Madison.
Frank Elwin Weymouth, B. C. E., Medford Center.
Beecher Davis Whitcomb, B. M. E. (in Electricity), Easton.
Gardiner Benson Wilkins, B. M. E. (in Electricity), Brownville.

The second degree was conferred upon 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:

Walter Wilson Crosby, C. E., Gardiner, Me.
Wilbur Allerd Bumps, M. S., Dexter, Me.

Honorary degrees were conferred upon the following persons as indicated:

Whitman Howard Jordan, Sc. D., Orono.
Mary Sophia Snow, Ph. M., Bangor.
Howard Scott Webb, M. E., Orono.

SCHOLARSHIPS AND PRIZES.

SCHOLARSHIPS.

THE KIDDER SCHOLARSHIP.—The Kidder Scholarship was endowed by Frank E. Kidder, Ph. D., of Denver, Colorado, a graduate of the 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.

PRIZES.

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 Hon. 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 WALTER BALENTINE PRIZE, the gift of Whitman H. Jordan, Sc. D., Geneva, N. Y., will be awarded to that member of the Junior Class who shall excel in Biological Chemistry.

THE KENNEBEC COUNTY PRIZE, the gift of the Hon. William T. Haines of Waterville, will be awarded to that member of the Senior class who shall write the best essay on Applied Electricity.

THE FRANKLIN DANFORTH PRIZE, the gift of Edward 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 agricultural course who shall attain the highest standing.

THE DECKER PRIZE, the gift of Wilber F. Decker, a graduate of the college in the class of 1879, will be awarded to that member of the Sophomore class, who shall show the greatest improvement in general standing during the current College year.

THE AROOSTOOK COUNTY PRIZE, the gift of the Hon. Charles P. Allen of Presque Isle, will be awarded to that member of the Freshman class who shall excel in algebra.

The prizes were awarded last year as follows:

The Prentiss Prize to George Greenwood Leavette, of South Berwick.

The Prentiss Declamation Prize to Gracia Lillian Fernandez, of North Dexter, and Charles Staples Webster, of Portland.

The Libby Prize, to Lore Alford Rogers, of Patten.

The Cumberland County Prize, to Clinton Leander Small, of Auburn.

The Franklin Danforth Prize, to Lore Alford Rogers, of Patten.

The Penobscot County Prize, to Edward Everett Gibbs, of Bridgton.

The Aroostook County Prize, to Herman Henry Oswald, of Philadelphia, Pa.

COLLEGE HONORS.

SPEAKERS AT COMMENCEMENT, JUNE, 1896.

Edward Everett Gibbs, Bridgton; Frederic Andrews Hobbs, Alfred; Paul Dudley Sargent, Machias; Perley Walker, North Anson; Charles Partridge Weston, Madison.

SPEAKERS AT THE JUNIOR EXHIBITION, JUNE, 1896.

Justin Robert Clary, Hallowell; Perley Francis Goodridge, Orono; William Lawrence Holyoke, Brewer; George Greenwood Leavette, South Berwick; Byron Frank Porter, Stillwater; Myron Roswell Russell, Vernon, Vt.; Edwin Carlton Upton, Bath.

SPEAKERS AT THE SOPHOMORE PRIZE DECLAMATION CONTEST, DECEMBER, 1895.

Grace Lillian Fernandez, North Dexter; Edwin Ernest Nowlan, South Strafford, Vt.; Charles Abram Pearce, Fort Fairfield; Arthur Horace Taylor, Machias; Charles Staples Webster, Portland; Horace Loring White, Portland; George Arthur Whittemore, Framingham, Mass.

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.

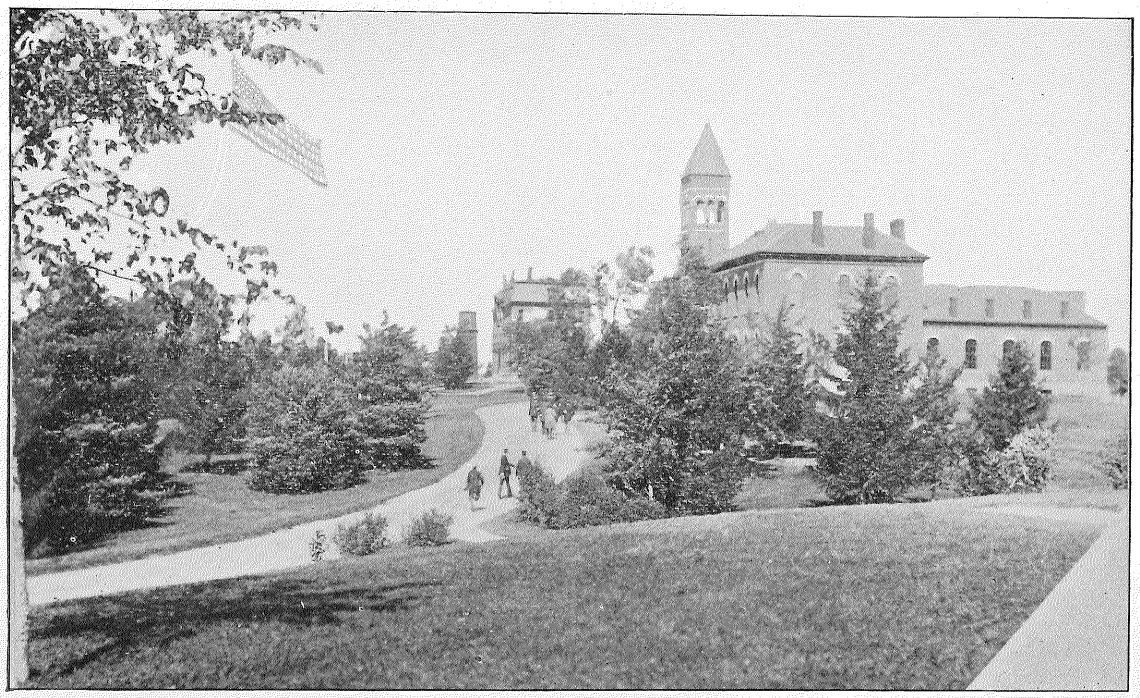
PUBLIC WORSHIP.

Religious services of a simple character are held in the college chapel every day except Sunday and Saturday. All students are required to be present. Every student is required to attend one church service on Sunday in 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 beautiful and healthful location in Penobscot county and the town of Orono, half way between the villages of Orono and Stillwater, three miles from the city of Oldtown, and nine miles from the city of Bangor. The Stillwater river, a tributary of the Penobscot, flows in front of the buildings, forming the western boundary of the campus. Orono is upon the Maine Central Railroad and is easy of access from all parts of the State.

The Bangor, Orono, and Oldtown Electric Railroad, runs through the college grounds. Visitors will find it convenient to take the electric cars at Bangor, Veazie, or Oldtown, as the electric road does not run to the Railroad station at Orono. Baggage may be sent to Orono by railroad, or from Bangor by the electric road.



THE MAIN DRIVE.

MILITARY INSTRUCTION.

Military instruction is required by United States law. The department is under the charge of a graduate of the United States Military Academy, an officer of the regular army of the United States, detailed by the President of the United States for this purpose. Cadet rifles, ammunition, and accoutrements are furnished by the War Department. The course has especial reference to the duties of officers of the line. The students are organized into an infantry battalion of four companies, band, and 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.

The trustees have prescribed a uniform consisting of dark blue blouse, with State of Maine buttons, and gold braid on cuffs; trousers of light blue; blue cap with gold wreath ornament; white duck trousers for hot weather; overcoat of dark blue beaver cloth, of ulster length, with broad collar and detachable cape. Students are not required to buy the overcoat unless an overcoat is needed. It is suitable for general use, and costs $15.00. Students are required to wear their uniforms during military exercises, and are allowed to do so at other times. The uniform can be obtained of Robinson & Co., of Bangor, at prices fixed by competitive bids. Students are at liberty to purchase of other persons, subject to the approval of the military instructor, who is required to see that the quality and fit are equal to those of the Robinson uniforms. The prices for the year ending November 30, 1895, were as follows: blouse $7.00; cloth trousers, $5.00; three pairs of duck trousers, $3.00; cap, $1.50; three pairs of gloves, 60c.; three belts, 30c.; total, $17.40.

The three cadets of the Senior class who attain the highest standing in the military department are reported to the Adjutant General of the U. S. Army immediately after commencement, and their names are printed in the U. S. Army Register. Cadets

who have satisfactorily completed the course in military science receive at graduation a certificate of military proficiency and are reported to the Adjutant General of Maine.

Military certificates were awarded at the Commencement of 1896 to the members of the graduating class, and were reported to the Adjutant General of Maine.

Frank Leonard Marston, Paul Dudley Sargent and Charles Partridge Weston were reported to the Adjutant General of the United States Army.

THE ORGANIZATION OF THE BATTALION.

OFFICERS AND NON-COMMISSIONED OFFICERS.

Lieutenant HERBERT NATHAN ROYDEN, 23rd U. S. Infantry, Commanding.

FIELD AND STAFF.

Major—WILLIAM THOMAS BRASTOW.

First Lieutenant and Adjutant—WILLIAM LAWRENCE HOLYOKE.
First Lieutenant and Quartermaster—JUSTIN ROBERT CLARY.
First Lieutenant and Chief Signal Officer—EDWIN CARLTON UPTON.

NON-COMMISSIONED STAFF.

Sergeant Major—SAMUEL CLARK DILLINGHAM.

Quartermaster Sergeant—CHARLES STAPLES WEBSTER.

Principal Musician ... ALBERT JAMES NUTE.
Musician ..... HUMPHREY ELMORE DESPEAUX.
Musician ..... ROY CHESTER GETCHELL.
Musician ..... HERBERT PALMER MAYO.

COMPANY A.

Captain.....CHARLES SIDNEY BRYER.
First Lieutenant .....HOWARD EVELETH STEVENS.
Second Lieutenant ...FRANK EDWARD GORHAM.
First Sergeant .....HERBERT IVORY LIBBY.
Sergeant.....HARRY ALLISON HIGGINS.
Sergeant.....RAY PARKER STEVENS.
Sergeant.....ALFRED ANDREWS STARBIRD.
Corporal.....CHARLES COMFORT WHITTIER.
Corporal.....HOWARD BRETT.
Corporal.....EBEN PIERCE BASSETT.
Corporal.....FRANK LOTHROP BATCHELDER.
Corporal.....WILLIAM AUGUSTINE MURRAY.

COMPANY B.

Captain.....STEPHEN SANS BUNKER.
First Sergeant .....GEORGE GREENWOOD LEAVETTE.
Second Lieutenant...BYRON FRANK PORTER.
First Sergeant .....BERNARD ALSTON GIBBS.
Sergeant .....WILSON DARLING BARRON.
Sergeant.....CHARLES PARKER CROWELL.
Sergeant.....RAY HERBERT MANSON.
Corporal.....CLINTON LEANDER SMALL.
Corporal.....EDWARD EVERETT PALMER.
Corporal.....HERMAN HENRY OSWALD.
Corporal.....WINFIELD BENSON CASWELL.
Corporal.....ARCHER LEWIS GROVER.
Corporal.....RUFUS HOUDLETTE CARLTON.

COMPANY C.

Captain.....ERNEST HENRY MACLOON.
First Lieutenant .... ALLEN ROGERS.
Second Lieutenant ...STANLEY JACOB HEATH.
First Sergeant .....LEON EDWIN RYTHER.
Sergeant.....EDWIN ALBERT STURGIS.
Sergeant .....CHARLES ABRAM PEARCE.

Sergeant .....WARNER EDWIN WELCH.
Sergeant .....LEROY EUGENE DOW.
Corporal.....HERMAN FRANK NOYES.
Corporal.....ARTHUR CLEMENT WESCOTT.
Corporal.....CYRENIUS WALTER CROCKETT.
Corporal.....EDWARD RAYMOND MANSFIELD.
Corporal.....LEONARD HARRIS FORD.

COMPANY D.

Captain.....CHARLES HENRY FARNHAM.
First Lieutenant.....JOSEPH WHITE HUMPHREY PORTER.
Second Lieutenant ..JOHN PARKS CHASE.
First Sergeant.....RODERICK DESMOND TARR.
Sergeant.....JOHN WASHINGTON DEARBORN.
Sergeant.....RALPH HAMLIN.
Sergeant.....WALTER JEAN MORRILL.
Sergeant.....LLEWELLYN NATHANIEL EDWARDS.
Corporal.....WILLIAM BRADLEY MORELL.
Corporal.....EDWIN SMITH LEVENSALER.
Corporal.....FRED WALTER ARMES.
Corporal.....FREEMAN AMES SMITH.

COLOR GUARD.

Color Sergeant.....ALBION DANA TOPLIFF MERRILL.

BAND.

First Lieutenant .....STANWOOD HILL COSMEY.
Second Lieutenant...PERLEY FRANCIS GOODRIDGE.
First Sergeant.....HARRISON PRATT MERRILL.
Sergeant.....GEORGE ARTHUR WHITTEMORE.
Sergeant.....CARL GARDINER WISWELL.
Corporal.....CHARLES ELBERT BLACKWELL.
Corporal.....IRVING HARRY DREW.
Corporal.....JOHN LEVERETT PIERCE.

SIGNAL SECTION.

Second Lieutenant...MYRON ROSWELL RUSSELL.
Sergeant.....HARRY MATTHEW LINCOLN.

CATALOGUE OF STUDENTS.

SENIORS.

Atwood, Edward Moseley,	Hampden,	K. Σ. House.
Brastow, William Thomas,	Rockport,	Q. T. V. House.
Brown, William Bourne,	Livermore Falls,	Mr. J. P. Spearen.
Bryer, Charles Sidney,	Boothbay,	Q. T. V. House.
Bunker, Stephen Sans,	Bar Harbor,	Q. T. V. House.
Chase, John Parkes,	North Edgecomb,	B. Θ. Π. House.
Clary, Justin Robert,	Hallowell,	Q. T. V. House.
Cosmey, Stanwood Hill,	Bangor,	B. Θ. Π. House.
Duncan, Lindsay,	Northfield, Mass.,	A. T. Ω. House.
Farnham, Charles Henry,	Beverly, Mass.,	The Commons.
Goodridge, Perley Francis,	Orono,	Home.
Gorham, Frank Edward,	Round Pond,	205 Oak Hall.
Gould, Vernon Kimball,	Milo,	111 Oak Hall.
Heath, Stanley Jacob,	Bangor,	K. Σ. House.
Holyoke, William Lawrence,	Brewer,	Prof. A. B. Aubert.
Leavette, George Greenwood,	South Berwick,	A. T. Ω. House.
Macloon, Ernest Henry,	Deering,	B. Θ. Π. House.
Patten, Andrew Jarvis,	Cherryfield,	A. T. Ω. House.
Porter, Byron Frank,	Stillwater,	Home.
Porter, Joseph White Humphrey,	Stillwater,	Home.
Rogers, Allen,	Hampden,	Q. T. V. House.
Russell, Myron Roswell,	Vernon, Vt.,	Mr. J. P. Spearen.
Stevens, Howard Eveleth,	Bluehill,	202 Oak Hall.
Upton, Edwin Carleton,	Bath,	B. Θ. Π. House.
Urann, Marcus Libby,	Dover,	201 Oak Hall.

JUNIORS.

Albee, George Plummer,	Richmond,	K. Σ. House.
Arche, John Francis,	Hallowell,	205 Oak Hall.
Bailey, Fred Wesley,	Belfast,	Mr. L. P. Harris.
Barron, Wilson Darling,	Dexter,	K. Σ. House.
Bartlett, Lester Franklin,	Nealey's Corner,	K. Σ. House.
Bird, Tyler Hanson,	Belfast,	A. T. Ω. House.
Brann, Leo Lewis Jefferson,	Gardiner,	B. Θ. Π. House.
Bryant, Edwin Scammon,	Portland,	212 Oak Hall.
Clark, Frederick Robinson,	Portland,	203 Oak Hall.
Crowell, Charles Parker,	Orono,	Home.
Coburn, William Bridgham,	Sherman Mills,	Mr. J. P. [Spearen.
Davis, Edward Harmon,	Auburn,	311 Oak Hall.
Dearborn, John Washington,	Bradford Center,	207 Oak Hall.
Dillingham, Samuel Clark,	Portland,	B. Θ. Π. House.
Dolley, Walter,	Gorham,	A. T. Ω. House.
Dow, Leroy Eugene,	Portland,	211 Oak Hall.
Dunn, Rena Ethel,	Orono,	Home.
Dunn, Rossell Olin,	Orono,	Home.
Edwards, Llewellyn Nathaniel,	East Otisfield,	104 Oak Hall.
Eldredge, Charles Thayer,	Foxcroft,	Mr. O. C. Dunn.
Ellis, Walter Lincoln,	Waterville,	A. T. Ω. House.
Farrar, Lottie Gertrude,	Bangor,	Mr. Chas. Buffum.
Fernandez, Grace Lillian,	North Dexter,	Oldtown.
Frost, George Sherman,	Bridgewater,	109 Oak Hall.
Gibbs, Bernard Alston,	Glenburn,	207 Oak Hall.
Hamlin, Ralph,	Orono,	Home.
Higgins, Harry Allison,	Woodfords,	A. T. Ω. House.
Hopkins, Fred Weston,	Bangor,	112 Oak Hall.
Johnson, Bertrand Randall,	Deering,	B. Θ. Π. House.
Lawrence, George Warren,	South Gardiner,	210 Oak Hall.
Libby, Albion Dana Topliff,	North Scarboro,	104 Oak Hall.
Libby, Herbert Ivory,	Biddeford,	Q. T. V. House.
Lincoln, Harry Matthew,	Bangor,	206 Oak Hall.
Manson, Ray Herbert,	Gardiner,	311 Oak Hall.
Merrill, Adelbert Samuel,	North Belfast,	Mr. P. Wall.
Merrill, Dana True,	East Auburn,	206 Oak Hall.

Merrill, Elmer Drew,	East Auburn,	206 Oak Hall.
Merrill, Harrison Pratt,	Wareham, Mass.,	208 Oak Hall.
Morrill, Walter Jean,	Madison,	K. Σ. House.
Pearce, Charles Abram,	Fort Fairfield,	A. T Ω. House.
Ryther, Leon Edward,	Bondsville, Mass.,	K. Σ. House.
Sawtelle, Fred William,	Fryeburg,	Stillwater.
Small, Albert Clifford,	Lisbon Center,	302 Oak Hall.
Smith, George Albert,	Auburn,	208 Oak Hall.
Sprague, Alden Percy,	Vanceboro,	112 Oak Hall.
Starbird, Alfred Andrews,	South Paris,	209 Oak Hall.
Stevens, Ray Parker,	Brooklin,	Q. T. V. House.
Sturgis, Edwin Albert,	Lewiston,	A. T. Ω. House.
Swett, Irving Cooper,	Bangor,	A. T. Ω. House.
Tarr, Roderick Desmond,	Biddeford,	Q. T. V. House.
Tolman, Fred Moses,	Carroll,	K. Σ. House.
Tolman, Wilfred Reuben,	Augusta,	203 Oak Hall.
Watts, Clarence Everett,	East Machias,	112 Oak Hall.
Webber, Mortimer Asa,	Fort Fairfield,	A. T. Ω. House.
Webster, Charles Staples,	Portland,	B. Θ. Π. House.
Welch, Warner Edwin,	Orono,	Home.
Wheeler, Walter Steadman,	Hudson, Mass.,	Mr. J. P. [Spearen.
Whipple, Albert Lawrence,	Solon,	A. T. Ω. House.
White, Horace Loring,	Portland,	K. Σ. House.
Whittemore, George Arthur,	Framingham, Mass.,	Q. T. V. [House.
Wiswell, Carl Gardiner,	East Machias,	Q. T. V. House.

SOPHMORES.

Armes, Fred Walter,	Gardiner,	K. Σ. House.
Bartlett, Charles Simming,	Norway,	Q. T. V. House.
Bassett, Eben Price,	Bangor,	303 Oak Hall.
Batchelder, Frank Lothrop,	Machias,	Mrs. J. E. Emery.
Belcher, Wallace Edward	Plymouth, Mass.,	B. Θ. Π. House.
Bird, James Alfred,	Presque Isle,	A. T. Ω. House.
Bixby, John Harold,	Anson,	307 Oak Hall.
Bixby, Oscar Merrill,	Anson,	307 Oak Hall.
Blackwell, Charles Elbert,	Madison,	Q. T. V. House.
Blaisdell, John West,	Franklin,	202 Oak Hall.

Boynton, Alson Edwin,	Alna,	Q. T. V. House.
Brett, Howard,	Bangor,	303 Oak Hall.
Brown, Charles Winchester,	Andover, Ct.,	Mr. French.
Brown, John Wilson,	Brimfield, Mass.,	Mr. A. L. [Moore.
Carlton, Rufus Houdlette,	Cedar Grove,	K. Σ. House.
Caswell, Winfield Benson,	Waterville,	A. T. Ω. House.
Closson, James Edward,	Monson, Mass.,	308 Oak Hall.
Crockett, Cyrenius Walter,	Rockland,	B. Θ. Π. House.
Crosby, Charles Elmer,	Albion,	306 Oak Hall.
Curtis, Norman Eldridge,	Lisbon Falls,	Mr. O. C. Dunn.
Despeaux, Humphrey Elmore,	Brunswick,	Mrs. G. V. Rolfe.
Downing, Marshal Buckland,	Dover,	201 Oak Hall.
Drew, Irving Harry,	Bar Harbor,	Q. T. V. House.
Farnham, Maude Lulu,	Stillwater,	Home.
Fernald, Reginald Lovejoy,	Orono,	Home.
Ford, Leonard Harris,	East Eddington,	Mr. O. C. [Dunn.
Fortier, Arthur Henry,	Oldtown,	Home
Getchell, Roy Chester,	Brewer,	303 Oak Hall.
Grover, Archer Lewis,	Bethel,	Mrs. J. H. Emery.
Guptill, Roscoe Volney,	Waterville,	301 Oak Hall.
Haney, William Wallace,	Eastport,	Mr. A. L. Moore.
Herald, Walter,	Calais,	A. T. Ω. House.
Hersey, George Woodman,	Portland,	A. T. Ω. House.
Heyer, Harry Sanford,	Friendship,	304 Oak Hall.
Hilton, George Libby,	Bradley,	306 Oak Hall.
Hoxie, Hall Farrington,	Waterville,	Mr. Marsh.
Johnston Cecil Chestnut,	Fort Fairfield,	A. T. Ω. House.
Judge, Thomas Francis,	Biddeford,	301 Oak Hall.
Keirstead, Alvin Willard,	Durham,	302 Oak Hall.
Leathers, Harry Hewes,	Hermon,	308 Oak Hall.
Levensaler, Edwin Smith,	Thomaston,	B. Θ. Π. House.
McCrillis, Ernest Julian,	Henniker, N. H.,	Mr. O. T. [Goodridge.
McCrillis, William George,	Henniker, N. H.,	Mr. O. T. [Goodridge.
McPheters, Ralph Herbert,	Orono,	Home.
Maddocks, Howard Lewis,	Skowhegan,	306 Oak Hall.

Mansfield, Edward Raymond,	Orono,	Home.
Mayo, Herbert Palmer,	South Boston, Mass.,	310 Oak [Hall.
Morell, William Bradley,	Amherst, Mass.,	Mrs. A. M. [Graves.
Morrisette, Rena Ermyra,	Stillwater,	Home.
Mosher, Edwin St. Elmo,	Presque Isle,	309 Oak Hall.
Moulton, Frank Augustus,	Limington,	304 Oak Hall.
Murray, William Augustine,	Pittsfield,	Mr. French.
Nelson, William,	Cumberland Centre,	305 Oak [Hall.
Noyes, Herman Frank,	Freeport,	Q. T. V. House.
Nute, Albert James,	East Boston, Mass.,	A. T. Ω. [House.
Oswald, Herman Henry,	Philadelphia, Pa.,	A. T. Ω. [House.
Palmer, Edward Everett,	South Bridgton,	B. Θ. II. House.
Pierce, John Leverett,	Machias,	312 Oak Hall.
Powell, Maurice Henry,	Orono,	Home.
Powell, Mildred Louise,	Orono,	Home.
Pretto, Henry Joseph,	Orono,	Home.
Robinson, Albert DeMerrett,	South Windham,	A. T. Ω. House.
Rockwood, Ralph Hubbard,	Waterville,	212 Oak Hall.
Scott, Charles Curtis,	Dexter,	Q. T. V. House.
Seavey, Haller David,	Bangor,	A. T. Ω. House.
Sidensparker, Stanley,	East Waldoboro,	Mr. Buck.
Small, Clinton Leander,	Auburn,	306 Oak Hall.
Smith, Edwin Melcher,	Gardiner,	305 Oak Hall.
Smith, Freeman Ames,	Thorndike, Mass.,	K. Σ House.
Stephens, Allen Whitmore,	Old Town,	Home.
Stinson, Frank Minott,	Bath,	310 Oak Hall.
Stover, Oliver Otis,	Freeport,	107 Oak Hall.
Strange, Edward Moore,	Saint Stephen, N. B.,	Stillwater.
Swain, John Henry,	Skowhegan,	Mr. L. P. Harris.
Swain, Pearl McIntyre.	Skowhegan,	Mr. L. P. Harris.
Trim, Amariah Colby,	North Islesboro,	Mr. A. Kenny.
Veazie, Marcellus Maurice,	Islesboro,	Mr. A. Kenny.
Wescott, Arthur Clement,	Portland,	Q. T. V. House.
White, Charles Harry,	Orono,	Home.
Whittier, Charles Comfort,	Skowhegan,	Q. T. V. House.

FRESHMEN.

Alden, Harley Roscoe,	Auburn,	K. Σ. House.
Alexander, Edgar Butler,	Lisbon,	Mr. L. P. Harris.
Alley, Fred Gilbert,	Dresden Mills,	Mr. L. P. Harris.
Bartlett, Charles William,	No. New Portland,	K. Σ. House.
Beedle, Harry Woodward,	South Gardiner,	403 Oak Hall.
Bird, Alan Lawrence,	Rockland,	B. Θ. Π. House.
Bogart, Fred Hammond Hanson,	Chester, Ct.,	Mr. L. P. Harris.
Bowerman, Frank Harvey,	Victor, N. Y.,	Prof. J. S. [Stevens.
Bradford, Fred Prince,	Eastport,	Mr. O. B. French.
Brown, Charles Leslie,	West Paris,	Q. T. V. House.
Brown, Charles Stanley,	Augusta,	412 Oak Hall.
Brown, Roy Huntley,	Montague City, Mass.,	Q. T. V. House.
Burgess, William Joseph,	Calais,	Mrs. Henry Finn.
Burnham, Agnes Rowena,	Oldtown,	Home.
Cargill, Walter Neal,	Liberty,	Mr. O. T. Goodridge.
Caswell, Wilfred Harold,	Bridgton,	Mrs. Marsh.
Clark, Wilkie Collins,	Skowhegan,	Mr. L. P. Harris.
Cleaves, Daniel Lunt,	Portland,	Mr. O. T. Goodridge.
Cobb, Walter Whiting,	Gorham,	Mr. O. B. French.
Cole, Clinton Llewellyn,	Pleasantdale,	204 Oak Hall.
Collins, George,	Athol, Mass.,	407 Oak Hall.
Cousens, Autense Luleen,	Stillwater,	Home.
Cross, Harry,	Brewer,	406 Oak Hall.
Cushman, Harvey Barnes,	Rockland,	A. T. Ω. House.
Davis, Fred Thaddeus,	Orono,	Home.
Davis, Harry Ashton,	Orono,	Home.
Davis, Susie Maud,	Bangor,	Home.
Douglas, Roscoe Synn,	West Gardiner,	Mrs. L. P. [Harris.
Drummond, Henry Frank,	Bangor,	K. Σ. House.
Dunn, Julian Sturdivant,	Cumberland,	Mr. O. B. French.
Eaton, Herbert Davidson,	Bangor,	Home.
Elliott, Wesley Clarendon,	Patten,	Oldtown.
Erskine, Christopher Albert,	Jefferson,	Mr. L. P. Harris.
Faunce, Benjamin Franklin,	Norway,	Mr. J. Parks.

Forbush, Ernest Carleton,	Marlboro, Mass.,	Mr. O. T. [Goodridge.
Foss, Charles Everett,	Brooks,	Mr. J. P. Spearen.
Foss, Paul Frank,	Weston,	402 Oak Hall.
French, Joseph Edwin,	South Chesterville,	Mr. J. P. [Spearen.
Garrigues, Frederick Lewis,	Waterbury, Ct.,	Mrs. Emery.
Gilman, John Averill,	Bangor,	B. Θ. II. House.
Glendinning, Henry James,	Woodfords,	B. Θ. II. House.
Goodwin, Philip Ross,	Randolph,	204 Oak Hall.
Gray, Charles Perley,	Oldtown,	Home.
Hall, Fred Elmer,	Pittsfield,	Mrs. A. Cowan.
Hamlin, George Otis,	Orono,	Home.
Hammond, Elwood,	Monson,	309 Oak Hall.
Hardy, Walter Manly,	Brewer,	B. Θ. II. House.
Hart, Malcolm Cole,	Willimantic,	Q. T. V. House.
Hatch, Howard Andrew,	Lindenville, O.,	B. Θ. II. House.
Hatch, Jesse Myron,	Eaton, N. H.,	Stillwater.
Hayes, James Arthur,	Randolph,	Mr. A. Moore.
Holley, Clifford Dyer,	Farmington,	408 Oak Hall.
Hersey, Guy Alfred,	Bangor,	Home.
Horner, Leon Herbert,	Springfield, Mass.,	K. Σ. House.
Houghton, Luke,	Anson,	Mr. J. P. Harris.
Howe, Ernest Judson,	South Lancaster, Mass.,	Mr. S. [Gee.
Johnson, Frank Ortelle,	North Berwick,	Q. T. V. House.
Jones, William Goldsbrough,	Orono,	Home.
Kittredge, Edward Leslie,	Orono,	Mr. Chas. Lee.
Knight, Frederick Hatherly,	Deering,	Mrs. H. Finn.
Lane, William Thomas,	Portland,	A. T. Ω. House.
Langstroth, Walter,	Somerville, Mass.,	Mr. T. [Simmons.
Leavitte, David Willard,	Parsonsfield,	Stillwater.
Leslie, Raymond Everett,	Patten,	Mr. J. P. Spearen.
Livermore, Edward Alonzo,	Gardiner,	Mr. A. L. Moore.
Lombard, Charles Hutchinson,	Portland,	Mrs. H. Finn.
Love, Alexander,	East Bluehill,	402 Oak Hall.
Lurvey, John Gardner,	Portland,	Mr. E. Webster.
McCarthy, Matthew,	Bangor,	Home.

McDonald, Frank,	Portland, Q. T. V. House.
MacDougal, Wilbur Edwin,	South Lincoln, Mr. J. P. Spearen.
Macurda, Wilder Xerxes,	Lisbon, Mr. L. P. Harris.
Mann, Edwin Jonathan,	West Paris, Mr. J. Parks.
Marsh, Stanley Nay,	Skowhegan, 102 Oak Hall.
Merrill, Wilbur Louis,	East Parsonsfield, K. Σ. House.
Miles, Elmer Laroy,	Patten, Oldtown.
Mitchell, Charles Augustus,	West Newfield, Stillwater.
Mitchell, Curtis Boyce,	Unity, Mr. G. W. Thurlow.
Mitchell, Fred Carlton,	West Newfield, Stillwater.
Mitchell, Frank Henry,	Charleston, 111 Oak Hall.
Monohon, George Robert,	Cherryfield, Mr. B. Page.
Moore, Percy Chadwick,	Bangor, Mr. B. Page.
Morrill, Stephen,	Portland, Q. T. V. House.
Morris, Lewis Gilbert,	Westbrook, 411 Oak Hall.
Moulton, Delbert Howard,	North New Portland, 109 Oak Hall.
Nason, Leon Alonzo,	Bangor, Home.
Nickerson, Percy Lee,	Swanville, Mr. J. P. Spearen.
Noyes, Elmer John,	Berlin, N. H., Mr. A. L. Moore.
Noyes, Frank Albert,	Berlin, N. H., Mr. A. L. Moore.
Owen, Alden Bradford,	West Pembroke, Mr. Percy Lowell.
Page, Arthur Southwick,	Fairfield, Mr. A. L. Moore.
Page, Harry Merton,	Guilford, 102 Oak Hall.
Payzant, George Francis,	Windsor Forks, N. S., Mr. O. C. Dunn.
Perkins, DeForest Henry,	North Brooksville, 412 Oak Hall.
Philoon, Daniel Lara,	Auburn, 204 Oak Hall.
Porter, Charles Omer,	Cumberland Mills, K. Σ. House.
Quimby, George Barker,	Westbrook, 410 Oak Hall.
Ricker, Percy Leroy,	Westbrook, 410 Oak Hall.
Robbins, Charles Alphonse,	Patten, Mr. J. P. Spearen.
Rollins, Clarence Herbert,	Veazie, Home.
Rollins, Frank Morris,	Waterville, A. T. Ω. House.
Rollins, Fred Willis,	Ellsworth Falls, Mr. J. P. Spearen.

Roston, Charles Duren,	Dorchester, Mass.,	Mr. E. Webster.
Russell, Leo Bernard,	Farmington,	Mr. T. Simmons.
Scribner, Roland Sampson,	Patten,	Oldtown.
Sharratt, John Henry,	Bondsville, Mass.	Mrs. Buck.
Smith, Edward Henry,	Ashville,	402 Oak Hall.
Smith, Ralph Waldo,	East Corinth,	Herrick Farm.
Stephens, Charles Walter,	Oldtown,	Home.
Stickney, Grosvenor Wilson,	Clinton, Mass.,	Mrs. J. Parks.
Stowell, Clarence Warner,	Brimfield, Mass.,	409 Oak Hall.
Strout, Howard Clinton,	West Harrington,	Mr. Spaulding.
Tate, Edwin Morrel,	East Corinth,	Mr. Spaulding.
Tate, Fred Foy,	East Corinth,	Mr. Spaulding.
Theriault, Dana Leo,	Caribou,	Mrs. A. Cowan.
Thombs, William Brackett,	Gorham,	A. T. Ω. House.
Toothaker, Melville William,	Dixmont,	Mrs. A. Cowan.
Vose, Fred Hale,	Milltown, N. B.,	B. Θ. Π. House.
Walton, Russell Davenport,	Orono,	Home.
Webster, Frank Elijah,	Patten,	Mr. E. Webster.
Weston, Benjamin Thomas,	Madison,	Mr. T. Simmons.
Weston, Wallace Augustus,	Madison,	Mr. T. Simmons.
Whitcomb, Joseph Orion,	Morrill,	106 Oak Hall.
White, Everett Leland,	Topsham,	K. Σ. House.
Wiley, Howard,	Bethel,	Mrs. G. W. Thurlow.
Wilson, George Truman,	Columbia Falls,	A. T. Ω. House.
Wormell, Ralph Geddes,	Waterville,	A. T. Ω. House.

LIBRARY ECONOMY STUDENTS.

Gardner, Hope,	Caribou,	Mr. C. Buffum.
Parker, Dora Lucinda,	Danversport, Mass.,	Mr. C. Buffum.

SPECIAL STUDENTS.

Crowell, Charlotte Edith,	Orono,	Home.
Cummings, George Harold,	Bangor,	Home.
Dunn, Nina Carle,	Orono,	Home.
Farnham, Henry Augustus,	Bangor,	Home.

Gooch, Fred Burton,	Yarmouthville,	Mrs. W. Powers.
Gray, Bessie,	Oldtown,	Home.
Green, Carrie Smythe,	Bangor,	Mr. C. Buffum.
Grover, Oscar Llewellyn,	Redlands, Calif.,	The Maples.
Haley, George,	East Brownfield,	Mr. O. T. Goodridge.
Hamlin, Emily,	Orono,	Home.
Hardy, Robert Samuel,	Bangor,	Home.
Leach, Herbert,	Moultonborough, N. H.,	Mr. T. Simmons.
Sawyer, Charles Jewett,	Bangor,	B. Θ. Π. House.
Swett, Carlotta,	Bangor,	Home.

STUDENTS IN THE SHORT WINTER COURSE IN AGRICULTURE.

Bamford, William Guy,	Livermore Falls,	Mr. J. P. Spearen.
Colson, Franklin Arbra,	Winterport,	Mr. O. C. Dunn.
Hawes, George Creighton,	Union,	Mr. O. C. Dunn.
Mansfield, Edward Raymond,	Orono,	Home.
Reed, Albert Wiggin,	Benton Falls,	Mr. O. C. Dunn.
Rideout, Moses Edmund,	West Sullivan,	Mr. J. P. Spearen.
True, Charles Wesley,	East Haverill, N. H.	Mr. J. P. Spearen.
Wells, Charles Nelson,	Minot,	Mr. O. C. Dunn.

SUMMER SCHOOL STUDENTS.

Abbott, Florence Augusta, Orono.
Teacher in Orono Schools.

Adams, Effie Ethelyn, Lincoln Centre.
Teacher in North Lincoln Schools.

Adams, Helen Louisa, Lincoln Centre.
Teacher in Village School.

Andrews, Maym Edith, Hermon.
Teacher in Rural School.

Averill, Gertrude Ella, Oldtown.
Teacher in Grammar School.

Backus, Mrs. Louise Jordan, Ellsworth.
Teacher in Graded School.
Bearce, Mabel Estelle, East Eddington.
Teacher in Rural School, Eddington.
Berry, Nina Frances, Exeter.
Teacher in Rural School, Garland.
Blanchard, Margaret Lancaster, Oldtown.
Bowers, Flora Edna, Burlington.
Bradbury, Mary Addie, Lincoln.
Teacher in Rural School, Chester.
Brawn, Albra Maude, Bradley.
Teacher in Intermediate School.
Bridges, Mabel Adell, Ellsworth.
Brown, Gertrude Alice, Stillwater.
Brown, Mrs. Lizzie Crosby, Detroit.
Burton, Blanche Evelyn, Brewer.
Burton, Mrs. Lucy Agness, West Pittsfield.
Teacher in Rural School.
Bussell, Edith Mae, Oldtown.
Butterfield, Carrie Elsie, Bangor
Teacher in First Grade School.
Chesley, Agnes Mae, Lincoln.
Teacher in Rural School, Enfield.
Clark, Abbie Ellen, Greenfield.
Clark, Elma, Augusta.
Teacher, Grammar School.
Clark, Emma. Augusta.
Teacher, Grammar School.
Clement, Mrs. Mary Tucker, Stillwater.
Colburn, Nellie Augusta, Orono.
Teacher, Public School.
Cole, Idowa Myrtle, Bangor.
Collins, Alice Marie, Bangor.
Cousens, Autense Luleen, Stillwater.
Cowan, Alice Kate, Orono.
Crane, Elizabeth Dunning, Stillwater.
Teacher in Grammar School, Oldtown.
Curtis, Lilla Eliza, Brewer.
Teacher, Rumford Falls.

Davis, Clara Lizzie, Veazie.
Teacher in Intermediate School.
Davis, Ivy Mary Effie, East Corinth.
Teacher in Rural School.
Day, Frank Almore, East La Grange.
Teacher in Grammar School, La Grange.
Doble, Clara Eva, Kingman.
Teacher in Ungraded School.
Doherty, Alice Maud, Augusta.
Teacher in Grammar School.
Dority, Sadie Anna, Bradley.
Teacher in Primary School.
Doughty, May Hight, Augusta.
Teacher, Grammar School.
Dunbar, Mary Joy, Castine.
Teacher in Intermediate School, Princeton.
Dyer, Cora Hardy, East Newport.
Teacher in Rural School, Carmel.
Dyer, Elberton Preston, Hartland.
Principal of Hartland Academy, Hartland.
Edwards, Gertrude Elizabeth, Lincoln.
Teacher in Rural School.
Emery, Eva Lillian, Howland.
Teacher in Rural School.
Farrar, Lottie Gertrude, Bangor.
Farrington, Rosilla Susan, Brewer.
Teacher in Graded School.
Fiske, Gracie Edith, Rockville.
Fitzgerald, Carrie Mary, Oldtown.
Teacher in Primary School.
Fogg, Emma Louise, Greenfield.
Folsom, Ethel L., Stillwater.
Freeman, Lizzie N., Pittsfield.
Teacher in Primary School.
French, Mattie Beulah, East Bangor.
Teacher in Intermediate School.
Friend, Bertha Linda, Etna.
Gaynor, Mary Ann, Ellsworth.

Genn, Alice, Prospect Ferry.
Teacher in Rural School.
Gilroy, Florence Josephine, Stillwater.
Teacher in Intermediate School.
Godfrey, Mrs. Laura, Bangor.
Gammon, Addie L., Old Town.
Teacher in Primary School, Milford.
Gammon, Alice Lillian, Old Town.
Teacher in Grammar School, Stillwater.
Goodwin, Estella May, Old Town.
Gray, Lena Dillingham, Old Town.
Gray, Charles Perley, Old Town.
Green, Carrie Smythe, Bangor.
Grindell, Mary Ann, Ellsworth.
Teacher in Rural School.
Gustin, Nellie Louise, Stillwater.
Harding, Orianna Frances, Prospect Ferry.
Harris, Elizabeth Shaw, Orono.
Teacher in Graded School.
Harvey, Addie Lillian, Orono.
Hersey, Cora Jane, South Exeter.
Teacher in Rural School, Garland.
Hersey, Maud Susan, South Exeter.
Teacher in Rural School, Exeter.
Higgins, Mary Caswell, Ellsworth.
Teacher in Grammar School.
Holmes, Edith Belle, Orono.
Holmes, Sara Agnes, Foxcroft.
Howard, Nettie Mabel, Brewer.
Teacher in Rural School.
Jackson, Annette Adelle, Hermon.
Teacher in Rural School.
Jepson, Bertha, Winterport.
Johnson, Edna, East Eddington.
Teacher in Graded School.
Johnson, Mrs. Rosamond, Old Town.
Teacher in Primary School.
Jordan, Mabel Robbins, Stillwater.

Joy, Abbie E., Ellsworth.
Teacher in Intermediate School.
Kingsbury, Alma Treat, Frankfort.
Teacher in Intermediate School.
Kingsbury, Nicie Adelaide, Frankfort.
Teacher in Graded School.
Lane, Mary Maude, Orono.
Larrabee, Theo Hope, Kingman.
Teacher in Rural School.
Lermond, Eunice A., Rockville.
Levenseller, Mabel Frances, East Hampden.
Lord, Effie Evangeline, Detroit.
Teacher in Primary School, Danforth.
McCarthy, Mary Elizabeth, Bangor.
Teacher in Graded School, Milford.
McCarthy, Lilian Clare, Bangor.
McCarthy, Matthew, Bangor.
McLaughlin, Gertrude, Stillwater.
McLaughlin, Isabel Ruby, Stillwater.
Teacher in Rural School.
McLeod, Annie E., Stillwater.
Teacher in Rural School.
McNamara, Mayme Elaine, Old Town.
Teacher in Rural School.
McNulty, Mary Ann, Stillwater.
Teacher in Graded School.
Maddan, Lucie Frances, Old Town.
Teacher in Rural School, Milford.
Marsh, Mrs. Annie Cousins, Old Town.
Mathews, Annie Amelia, Stillwater.
Teacher in Primary School, Old Town.
Mathews, Mary Ella, Stillwater.
Merrill, Florence Annie, Stillwater.
Teacher in Primary School, Old Town.
Merrill, Katherine Hallett, Old Town.
Teacher in Rural School, Bradley.
Merryman, Emma E., Levant.
Michaels, Janie Chase, Stillwater.

Miller, Addie Mae, Greenfield.
Moore, Mrs. Lizzie S., Ellsworth Falls.
Teacher in Intermediate School.
Morse, Ernest Edwin, Rumford Falls.
Superintendent of Schools.
Mosher, Hattie Louise, Bangor.
Teacher in Graded School.
Moulton, Edith Ester, Bradley.
Teacher in Rural School.
Mullan, Annie Frances, Ellsworth.
Mullaney, Agnes Maureen, Bangor.
Teacher in Graded School.
Murphy, Frances Ella, Old Town.
Teacher in Intermediate School.
Mutty, Eva Rose, South Brewer.
Principal of Brimmer Grammar School, Brewer.
Neville, Ann Elizabeth, Bangor.
Nickerson, Harriette Chambers, South Brewer.
Osgood, Burt Stirling, Kingman.
Teacher in Rural School, Drew Plantation.
Page Pitt Millard, Kingman.
Teacher in Rural School.
Patten, Minnie Blanche, West Pittsfield.
Teacher in Rural School, Pittsfield.
Peavey, Ralph Albert, Bangor.
Perry, Eva Virginia, Orono.
Teacher in Graded School.
Pierce, Howard, Blaine.
Pierce, Louise Norris, Old Town.
Pollard, Frances Ellen, Old Town.
Porter, Rebie Emily, West Old Town.
Pratt, Helen, Old Town.
Pratt, Susan Caroline, Old Town.
Quincy, Tena Cutler, Bangor.
Ramsdell, Fauncette Mable, Lincoln.
Teacher in Rural School, Lincoln.
Remick, Hettie Florence, Ellsworth.
Teacher in Rural School.

Rogers, Maude, Bangor.
Rolfe, Mrs. Grace Vinal, Orono.
Ryder, Sadie Ambrose, Bangor.
Sanford, Minnie Belle, Bradford Center.
Teacher in Rural School, Greenfield.
Sargent, Susan Amelia, South Brewer.
Seavey, Haller D., Bangor.
Shorey, Sara Ella, East Corinth.
Teacher in Rural School.
Smart, Martha Ada, Maxfield.
Teacher in Rural School.
Smith, Lizzie Marion, East Bangor.
Teacher in Graded School, Patten.
Snow, Linnis Abby, Snow's Corner.
Teacher in Rural School.
Snow, Minnie F. C., Melrose, Mass.
Spencer, Angie Estella, South Lincoln.
Teacher in Rural School.
Sprague, Mary Etta, Vanceboro.
Teacher in Intermediate School.
Spratt, Mary Robinson, Bangor.
Spurling, Carolyn Wilma, Brewer.
Teacher in Rural School.
Stevens, Eleanor Mae, Old Town.
Teacher in Graded School.
Stone, Carolyn Alice, Brewer.
Swett, Carlotta, Bangor.
Taylor, Etta M., Lincoln.
Teacher in Rural School, Passadumkeag.
Taylor, Winifred Emma, Bangor.
Thissell, Mrs. Etta H., Bangor.
Thissell, Maud Evelyn, Bangor.
Thomas, Edith Hattie, Belfast.
Teacher in Graded School.
Thomas, Ethel Etta, Belfast.
Teacher in Graded School.
True, Elizabeth, Ellsworth.
Varney, Ethel Susan, Old Town.
Teacher in Graded School.

Vickery, Myra Frances, Bangor.
Wakefield, Angie Gertrude, East Lowell.
Teacher in Rural School, Lowell.
Wentworth, Lillian Patience, Exeter.
Teacher in Rural School.
Ware, Jennie Maria, Bangor.
Teacher in Graded School.
Warren, Saidee Eliza, Lincoln.
Teacher in Rural School.

SUMMARY.

Seniors,	25
Juniors,	61
Sophomores,	80
Freshmen,	127
Library Economy students,	2
Special students,	14
Students in the Winter Course in Agriculture,	8
Total,	317
Summer School students,	158

INDEX.