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FOR THE YEAR

1889

VOLUME II.

AUGUSTA:
BURLEIGH & FLYNT, PRINTERS TO THE STATE.
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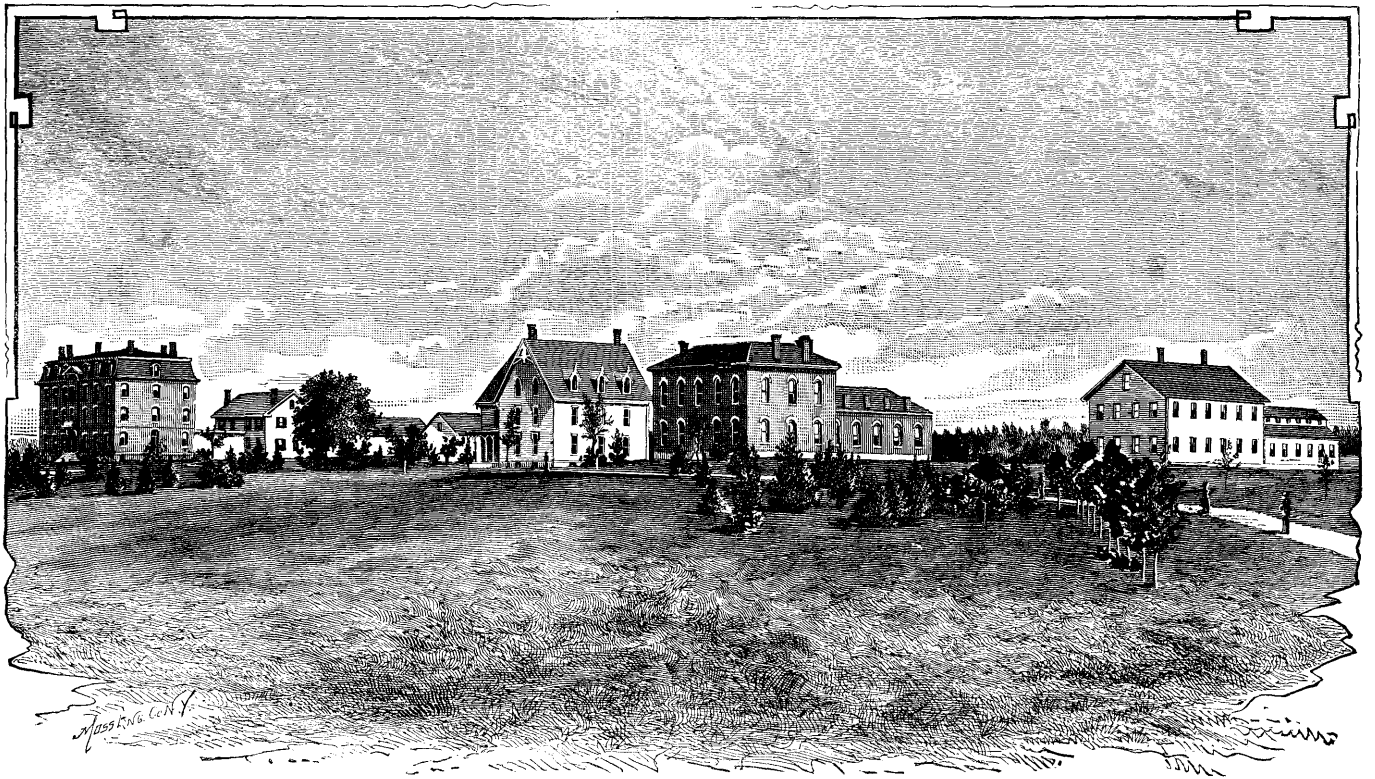

PRINCIPAL BUILDINGS OF THE MAINE STATE COLLEGE.

Oak Hall and Boarding-House. Wingate Hall. Chemical Laboratory. Shop.

ANNUAL REPORTS

OF THE

TRUSTEES, PRESIDENT AND OTHER OFFICERS

OF THE

State College of Agriculture

AND THE MECHANIC ARTS,

Orono, Me., 1888.

Published agreeably to a Resolve approved February 25, 1871.

AUGUSTA:
BURLEIGH & FLYNT, PRINTERS TO THE STATE.
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TRUSTEES' REPORT.

To His Excellency, the Governor and the Honorable Council:

The Trustees of the State College of Agriculture and the Mechanic Arts respectfully submit this, their twenty-first annual report, and, therewith, the reports of the President and members of the Faculty; also, that of the Treasurer.

There has been more change in the *personnel* of the board of trustees since their last report than in any preceding year except that of 1879.

The vacancy made by the expiration of the term of Hon. Daniel H. Thing was filled by the appointment of Rutillus Alden, Esq. The vacancies following the resignations of Hon. E. E. Parkhurst and Gen. Charles Hamlin were filled by the appointment of William H. Strickland, Esq., and Hon. Fred Atwood.

The *personnel* of the board of instruction remains substantially the same as at the date of our report of last year. The addition of important facilities for effective work makes the several courses of instruction much more valuable to the students than ever before.

Since our last report, the establishment of the National Experiment Station upon the college grounds has imposed new and important responsibilities upon the board of trustees and officers of the college. The station has been organized for effective work and has entered upon several important lines of investigation, which cannot fail to be of great value to the interests of agriculture in the State. The lines of work, so far as now determined on, will be explained

in Prof. Jordan's forthcoming annual report. A substantial brick building for the use of the station has been nearly completed and equipped for the prosecution of its important work.

The presence of the station in close proximity to the college proper, where a part of its appropriate work is conducted by the college professors cannot fail to be of much advantage to the students.

Coburn Hall, constructed for the use of the departments of Natural History and Agriculture is a very important feature of the college. Although constructed with especial reference to the departments named, it is an important factor of the college as an aggregation of departments. The equipments and material of the departments of Natural History and Agriculture have been transferred from the extemporized and pent-up quarters hitherto occupied, to spacious apartments in Coburn Hall. Specimens—animal, botanical, geological, mineral, etc., classified, labelled and registered, have taken their alloted places on shelves and in cases arranged for their reception, ready for inspection and study.

Ample room has been reserved for the laboratory work of both departments. Some of the most approved agricultural machines and implements have been received from generous donors, and placed on exhibition in the basement of the building, a spacious apartment reserved for that purpose.

One of the most spacious apartments has been devoted to the purposes of the library, which has, hitherto, been divested of much of the usefulness of which it was susceptible, by want of space for its arrangement. Its books are now in the process of classification and arrangement on ample shelves, and their contents are to be summarized, so tnat the student may be directed to the information they contain without unnecessary delay. The work of classification and arrangement has been placed in skilful hands.

Prof. Harvey, of the department of Natural History has mapped a broad field for investigation and research. The *expensive* part of the preparation for good work in his depart-

ment has been provided for by the construction of Coburn Hall. Some of the tools and equipments have been supplied. Others will be needed, and should be supplied. The work laid out is of great importance to the State, and has been committed to able hands. The report of Prof. Harvey which accompanies this will reveal the character of the work proposed, the methods of its accomplishment, and the means needed to carry it on.

FARM.

The farm has been without stock for two years. Deterioration has been the result. This process will go on until it is re-stocked. There has been a belief somewhat prevalent that the loss of the stock was due to bad sanitary conditions, or negligence, or improper feeding. If there is still, anywhere, a lingering doubt upon these points, the following testimony should dispel it.

Dr. Charles B. Michener, an expert veterinarian, was sent by the United States Commissioner of Agriculture to examine the stock and determine the character of the disease. From his report to Hon. Frederick Robie, then Governor of the State, the following statement is copied: "I was first led to examine the hygienic surroundings. The barn is a large one and has ample room for the stock. It is well lighted and thoroughly ventilated; the air being surprisingly pure as I entered the building in the morning. The stalls are kept clean as the animals themselves show. The manure is thrown in the basement, but a free current of air prevents any appreciable odor from rising to the stable. The feeding is judicious in every sense, and the food, both grain and hay, is of the best quality." * * * "In answer to those who contend that this disease was caused by improper feeding, or lack of sufficient ventilation and exercise, it is only necessary to remind you that tuberculosis, like small-pox, and similar diseases is a specific malady; one that can *only* be spread by coming in contact in some way with its special and determined infecting agent."

Dr. George H. Bailey, "Secretary and Veterinary Surgeon of the Board of Commissioners for Maine on Contagious Diseases of Animals" gives the following testimony in his report to the legislature: "At the time of my first visit I found the buildings in which the cattle were contained, were among the best and most commodious I had ever visited, and that every provision for the maintenance of perfect health among the occupants had been fully and amply secured. An abundance of sunlight and pure water, scrupulous cleanliness, sufficient and wholesome nutrition, thorough drainage, and ventilation so perfect that the air was almost as pure inside the barn as out." The present manager of the farm, in referring to the delay in re-stocking, tersely says: "This course, if continued much longer, will bring neither credit nor profit to the Institution. Some measures should be taken as soon as practicable for placing the farm on a sound business basis." The Trustees concur with Prof. Balentine.

INSTRUCTION IN SHOP WORK.

Unlike the farm, the condition of the department of shop instruction and practice, is of the most encouraging character.

The number of students taking this course has increased from year to year, until the space, equipments and tools, which, at first, were, adequate to meet all requirements, are entirely insufficient to meet current necessities. The reports of Prof. Flint and Instructor Webb, to which attention is respectfully called, will show, in detail, the present needs of the department.

BOARDING HOUSE.

The boarding house, under the management of Mr. and Mrs. Spencer is still meeting the requirements made upon it with entire satisfaction to the Trustees.

MILITARY DEPARTMENT.

In the early years of the college it was difficult to awaken much interest in military drill and tactics. Then, as now, such practice was compulsory, but there was a lack of

enthusiasm which made it irksome. Students felt that the time so spent could be made more pleasant and profitable if spent in study or pastime. All this has been changed. For several years, an army officer, graduated from West Point, has been assigned to the military department. Better instruction, public and competitive drills, attractive uniforms and occasional encampments, combined with a wider range of study, have raised this department to a higher plane of efficiency and usefulness than it has heretofore occupied.

CONCLUDING REMARKS.

The State college has a history of twenty years behind it. At the beginning of this period, it entered upon a field of educational work hitherto unexplored. The predictions respecting its future, if, indeed, a future was in reserve for it, were not of the most encouraging character. One of the most common expressions of belief respecting it was, "that it would fall into the old groves," and simply add another to existing institutions whose purpose was to train young men for the liberal professions. At the date of the establishment of the State college, it was estimated that seventy per cent of the students graduated from existing colleges found their life's work in the liberal professions. The State college graduated its first class in 1872. The whole number of graduates to this date is 278. Of these, less than ten per cent are embraced in the learned professions.

A large proportion of the remaining ninety per cent is engaged in the active business pursuits of the country. Many of them have attained positions of responsibility, trust and emolument, which only energy, intelligence and skill could have given them. It is a marked feature of the institution, that its broad range of instruction and practice, gives to its graduates the key to success without the intervention of a term of apprenticeship. Leaving the college, they at once become wage earners. It is true, also, of such instruction and practice that it often develops aptitudes in students for

certain lines of employment, of the existence of which neither themselves nor their most intimate friends had been conscious. Many a graduate, but a short time out of college finds himself in some useful and honorable employment, of which neither himself nor his friends had dreamed.

The success of the college has been more complete than the most sanguine among its early friends and projectors ever dared to claim for it, and in no two years has the measure of its usefulness been so large as in the last two.

Students in increasing numbers, and avenues opening to fields of wider usefulness, create an imperative demand for more space and additional equipments for several of the departments, and additional apparatus for all.

The needs of the college are presented in detail in the report of President Fernald, which will be submitted with this report.

The trustees respectfully and earnestly invoke considerate attention to the work and needs of this growing institution.

Respectfully submitted,

LYNDON OAK,

President of the Board of Trustees.

PRESIDENT'S REPORT.

To the Trustees of the Maine State College of Agriculture and the Mechanic Arts:

GENTLEMEN: This report, designed for the year 1888, contains also a record of progress for the past two years. The latter record is rendered necessary by the fact of biennial legislative sessions and especially because of the wise and liberal provision for the college by the last legislature, whereby an advance in certain lines of college work has been made possible.

RECORD OF MATERIAL PROGRESS.

The appropriation by the legislature of 1887 for a building of natural history and agriculture has secured the construction of an edifice in every way adapted to the wants of the two departments. In the summer vacation, 1888, a transfer was made of the collections of these departments to the new building and in it during the autumn, class-room work has been carried on. A transfer of the library has been made also to "Coburn Hall," in which a commodious, amply lighted and very pleasant room furnishes space for the books now arranged so as to be easily accessible, and for a reading room highly valued also by all connected with the college. Although the number of books is small yet the complete analysis and classification now in progress will render readily available to the student whatever material the library contains.

The large audience room in the third story of the building is now used for chapel services and the room on the first floor

designed for a physical laboratory will be brought into service as soon as it can be equipped with appropriate physical apparatus.

It would be impossible for me to express the appreciation by both faculty and students of the improved accommodations and facilities for instruction afforded by Coburn Hall. It was built not an hour before the necessity for it was imperative, although many years after the date when such a structure would have been highly serviceable to the college in its growing need of ampler accommodations.

An event so important in the history of the college as the completion of Coburn Hall; and through the college an event of so large prospective value to the State was deemed worthy of special observance, and, accordingly, ceremonies of dedication were held in the audience room of the building on June 26, 1888, an account of which, with the principal addresses then given, will be found as an appendix to this report.

The appropriation by the last legislature for apparatus has been expended as assigned to the several departments and has strengthened them all in this regard.

In giving practical instruction, apparatus largely constitutes the tools with which to work, and hence money judiciously expended in its purchase is money wisely invested and sure to yield ample returns in the increased efficiency of those under instruction.

The money assigned by the legislature for a water-tank and for a more thorough system of drainage has been expended for these purposes with great advantage especially on sanitary grounds.

Considerable repairs have been made on the college buildings and yet much remains to be done. The most complete renovation in any building has been in Oak Hall, in which the wainscoting was carried up three and a half feet, making the present height between six and seven feet. The lower half was painted India red and the upper half a light contrasting color. Closets were placed in the basement and the building

thoroughout materially improved. Students have fitted up their own rooms tastefully and have taken much pride in good care of the building.

The mechanical shop has been painted, the chimneys of all the buildings have received needed attention, roofs beginning to leak have been repaired. The trimmings of Oak Hall and of the chemical laboratory formerly white, have been painted chocolate brown and all the sashes in these buildings have been drawn. Many other minor repairs have been made. The proper preservation of the college buildings is a matter of no inconsiderable importance and requires and has to receive constant attention. The boarding house is the building that just now is deteriorating most and should be painted early next season. Other wooden buildings belonging to the college should also be painted soon as a matter of preservation. The north cellar wall of Wingate Hall is defective, and should be built over. These and other repairs not necessary now to specify will need to be made within the next two years.

The college campus, not now unattractive, by a moderate outlay of money can be much improved and rendered a place of interest to visitors as well as of satisfaction to those whose daily life is largely passed within its limits.

INSTRUCTION.

The work of instruction has been carried on essentially as indicated in the last report; the new men, Messrs. Hart and Webb, maintaining themselves well in their respective lines of instruction.

Lieut. Charles L. Phillips, 4th U. S. Artillery, who served as military professor for three years, completed the term of his detail to this college last July and retired from it with the heartiest good will of his associates in the faculty and of the students who had been under his instruction.

The vacancy thus made was filled by the assignment of Lieut. Everard E. Hatch, 18th U. S. Infantry, as professor of mili-

tary science and tactics at the Maine State College. Under his detail, Lieut. Hatch kindly consents to teach one mathematical branch of study in addition to his military duties. During the autumn, 1888, he has taught analytical geometry to the junior civil engineers and has shown himself to be a competent and faithful instructor. The college has been fortunate in the officers previously detailed for service here and is fortunate still in the present assignment.

Prof. Rogers, absent in Europe on leave, arranged to have his classes taught during his absence by Mrs. Mary L. Fernald, who, during the autumn, 1888, has successfully and acceptably performed the duties thus undertaken. Her classes have been Sophomores in French, Juniors in German and in English and American Literature and Seniors in Political Economy. Prof. Rogers is expected to return by the beginning of the spring term, 1889. Prof. W. F. Wentworth recently of Boston, Mass., gave the elocutionary drill to the several classes for the last commencement exercises. The classes gave evidence of thorough and efficient training.

COMMENCEMENT AND DEGREES.

The order of exercises, Seventeenth Annual Commencement, June 23–29, 1888, is herewith presented.

1888. June 23, Saturday, 7.30 P. M., Sophomore Prize Declamation.

24, Sunday, 7.30 P. M., Baccalaureate Services; Discourse by the President of the College.

25, Monday, 7.30 P. M., Junior Exhibition.

26, Tuesday, 9 A. M., Meeting of the Trustees.

2 P. M., Dedication of Coburn Hall. (See appendix).

8 P. M., President's Reception.

27, Wednesday, 9 A. M., Commencement Exercises.

3 P. M., Meeting of Alumni.

The Prentiss Prize, for excellence in declamation, sophomore class, was awarded to George Herbert Babb, Sebago, the committee of award making honorable mention of Joseph Riley Rackliffe, Hampden, and of Elmer Lake Morey, Colombo, Ceylon.

The Prentiss Prize, for excellence in composition, junior class, was awarded to Fred Percy Briggs of Hudson, author of essay entitled "Agricultural Education," the committee making honorable mention of George Melville Gay of Damariscotta, writer of "Farming Life in New England," and of Mortimer Frank Wilson of Orono, writer of "Our Country; Its Present and Probable Future."

The Libbey Prize for best agricultural essay was awarded to Fred Percy Briggs, Hudson, author of "Agricultural Education;" honorable mention being made by the committee of George Gifford Freemen of Cherryfield, writer of essay entitled "Country Roads."

The prizes above referred to were given by Mrs. H. E. Prentiss of Bangor and by Hon. Samuel Libbey of Orono. By the bounty of a lady who desires that her name shall be unknown, two awards were made for highest standing in "scholarship and deportment" limited to the sophomore and freshman classes. In the sophomore class, the award was made to Chandler Cushman Harvey of Fort Fairfield, whose rank on the scale of 100 was 97.01, Hugo Clark of Lincoln with a rank of 94.89, and Everett Fenno Heath of Bangor with a rank of 94.15 received honorable mention.

In the freshman class, the award was made to Leslie Albert Boadway of Orono, whose rank was 96.3; honorable mention being made of William Rowe Farrington of Portland, whose rank was 95.3, and of James Walker Davis of Yarmouthville, whose rank was 94.6.

The subjects of essays and the names of candidates who received degrees are given below:

BACHELOR'S DEGREE.

Degree of Bachelor of Science—Course in Agriculture: William Jerome Hancock, Saco, Soil Absorption; John

Wood Hatch, Presque Isle, Agricultural Societies; Thomas George Lord, Skowhegan, Vitality of Seeds.

Course in Chemistry—John Russell Boardman, Augusta, Animal Alkaloids and Their Relations to Disease; Francis Stephen Brick, Biddeford, Ideals; Harry Butler, Hampden, Disinfection and Disinfectants; Harry Foster Lincoln, Dennysville, The Fishery Question; Ralph Hemenway Marsh, Bradley, The Right of Suffrage; Nathaniel Estes Wilson, Orono, Chemistry of Light.

Course in Science and Literature—Edward Henry Elwell, Jr., Deering. Immigration.

Degree of Bachelor of Civil Engineering—Hiram Bertrand Andrews, Cape Elizabeth, Progress in Civilization; Charles DeWitt Blanchard, Oldtown, Relief of Social Pressure; Dudley Elmer Campbell, North Harpswell, Growth of Engineering; Seymore Farrington Miller, Burlington, Mystery; William Philbrook, Shelburne, N. H., History and Biography; Frank Adelbert Smith, East Corinth, Development of the Constitution.

Degree of Bachelor of Mechanical Engineering—George Stetson Batchelder, Exeter Mills, Electric Lighting; Fred Langdon Eastmen, East Hiram, The Steam Engine as a Primary Motor; Claude Lorraine Howes, Boston, Mass., Success; Seymour Everett Rogers, Stetson, Our National Game; George Edwin Seabury, Fort Fairfield, Development of the Steam Engine; Frank Llewellyn Small, Freeport, Coast Survey.

MASTERS DEGREE.

Master of Science—Henry Tossey Fernald, Baltimore, Md., Thesis, The Digestive System of Passalus Cornutus, Fab.; Levi William Taylor, Pittsfield, Me., Oration. Demand for Normal Schools and Normal Training; Harriet Converse Fernald, Orono, Me., Thesis, The Card Catalogue for Libraries; Oliver Cummings Farrington, New Haven, Conn., Oration, The Profits of a College Education.

Mechanical Engineer—Elmer Orlando Goodridge, Helena, Montana, Thesis, The Ingersoll Rock Drill; Leonard Gregory Paine, Providence, R. I., Thesis, High Speed Attachments for Milling Machines.

Civil Engineer—Lieut. Charles Leonard Phillips, 4th. U. S. Artillery on duty as Military Professor, Maine State College.

GRADUATES AND NON-GRADUATES.

The number of graduates is 278; the number of non-graduates is 291. The average period of attendance of the non-graduates is above one and one-half years. The number of students in the college is 121. It thus appears that 690 different students have obtained or are now obtaining their collegiate education at this institution. Of the 278 graduates 15 have died, leaving 263 now living. Of the living graduates 17 are farmers and 14 are specialists in agriculture, viz: One professor of agriculture, 1 professor of botany and horticulture, 1 director agricultural experiment station, 7 assistants in agricultural experiment stations, 3 veterinary surgeons, one of whom is veterinarian to an agricultural experiment station, and 1 editor agricultural paper, 29 are mechanical engineers, 65 civil engineers and 10 are engaged in manufactures. In other words 12 per cent are engaged in agricultural pursuits, 11 per cent in mechanical engineering, 24 per cent in civil engineering and 4 per cent in manufactures; or, summarizing, 51 per cent are engaged in these four important forms of industry.

Of the 128 graduates remaining, 23 are teachers and 49 are engaged in miscellaneous callings. Many of these, it is safe to say, will eventually be found engaged in the four leading pursuits above named. Of the living graduates, 23 or 9 per cent are engaged in the so-called professions and 91 per cent in other and varied industries.

FINANCIAL STATISTICS.

The endowment fund derived from the sale of land-scrip furnished by the national government was $118,300 which

with accumulated interest amounts to $131,300. This fund yields at the present time $7,638 per annum.

The munificent bequest by Hon. Abner Coburn of Skowhegan of $100,000 not yet drawn from the estate is paying interest at four per cent and hence yields for the present $4000 a year. The receipts from tuition are necessarily variable but may be reckoned $3000 a year.

The State appropriations have amounted to $247,218. The buildings are valued at $156,000; the apparatus including that of the experiment station at $20,000; the library at $8500, the farm, tools, stock, carriages, &c., at $19,000, making a total of $203,500.

EXTRACT FROM AN ADDRESS BY HON. JUSTIN S. MORRILL OF VERMONT.

It will be remembered that Hon. Justin S. Morrill of Vermont was the originator of the proposition to establish land-grant colleges and that the act proposed by him, having passed Congress in 1858 was vetoed by President Buchanan and that subsequently, in 1862, the measure was re-enacted and received the sanction of President Lincoln.

Mr. Morrill's relations to the original act of Congress and his cordial and earnest support of all measures designed to promote the welfare of these institutions will cause the following extract from an address recently delivered by him before the legislature of his State in behalf of the Vermont Agricultural College to be read with interest.

"Under the College Land-Grant of 1862, forty-seven institutions have been organized, and they are nearly all now doing excellent educational work. They have over five thousand students and nearly five hundred professors. In every State scientific knowledge is being more or less diffused and the science of agriculture is especially receiving profounder attention and is more respected and honored.

The bounty of the national government formed a nucleus in the several States around which, buildings, libraries, labora-

tories, museums, workshops, gymnasiums, military halls and other educational appliances were expected to be assembled, from funds derived from other and independent sources. It will be remembered that no portion of the national fund can be expended for such purposes, however, indispensable,—that is to say, for the erection or purchase of buildings, or for keeping them in repair. It was expected that State and individual spontaneous assistance, to the extent of these minor and varying wants, would serve to maintain the bounty of the national government intact, and that sufficient local consideration and State interest in behalf of the colleges would be enlisted to secure their prosperity and proper management.

I am glad to say that this expectation was well-grounded, and that the generosity of the American people and the liberality of States, with hardly an exception, was not over-estimated."

Mr. Morrill then proceeds to give a short chapter of statistics, "to show how wonderfully these colleges have been built up and how solidly they are supported."

From this chapter a few statistics are selected: "The college in Indiana, besides the land fund, has received from State appropriations, $250,150; from the county where the college was located, $50,000; from a single individual $100,000, and from other benefactions, $50,000.

That of Illinois has received from the State $499,500, and benefactions to the amount of $306,400.

That of Ohio has received from the State $205,543, from the county where the college was located $300,000, and $28,000 from other benefactions.

Kentucky levies an annual tax yielding about $16,000 for the support of her college, which has received $104,082 in benefactions.

Mississippi, for her two colleges, appropriated $85,000 in 1881, and two years later $120,000.

Kansas obtained eight dollars per acre for its land scrip, instead of the fraction of a dollar obtained by Eastern States, and her college has received from the State and from benefactions $277,962.

Pennsylvania has recently made liberal appropriations, for buildings related to agriculture $50,000, for drill hall and gymnasium $20,000, and for current expenses of two years $165,000.

Colorado, keeping her land for a higher price, has appropriated for its college $141,680, and levies an annual tax for its support of one-fifth of a mill on all taxable property of the State."

INVESTMENT OF THE COBURN BEQUEST.

It will be recalled that the legislature of 1887 made provision for the investment of the $100,000 willed to the college by Hon. Abner Coburn, in a State bond bearing interest at four per cent and running thirty years.

While investment in State security is highly desirable, it should not be forgotten that the bequest is practically a gift to the State to increase the endowment of the college, and that the endowment fund of the government is not allowed to be invested in securities paying less than five per cent per annum, and that this latter fund is actually paying six per cent. Under these circumstances it certainly would seem to be but a fitting response to Governor Coburn's generosity for the State to advance the interest to six per cent. I trust the necessary change in the rate of interest will be made by the legislature and that you may then deem it wise to make the State the custodian of this bequest for the next thirty years.

BUILDING LOTS FOR PROFESSORS HOUSES.

There is reason to believe that if building lots on the college grounds can be leased to college officers for a long period that several officers would soon erect houses upon them and thus establish themselves in closer proximity to the buildings in which their work is carried on. In such an

arrangement there is an economy of time and force quite too important to be disregarded. This subject, with what may be involved in it, I am confident, will commend itself to your consideration.

FARM AND STOCK.

As reported last year, the net indebtedness of the farm in April 1887, resulting principally if not wholly from the destruction of its fine herd was $6,103.68. With this indebtedness unprovided for, there seemed to be but one safe course to pursue. The operations of the farm have therefore been necessarily limited. It is to be hoped that the time is near when a different policy can be adopted and the farm, fairly supplied with stock can be made to illustrate the best methods of agricultural practice. It can thus serve a most useful purpose in the teachings of the college and fulfill its design as a factor of instruction.

The herd was destroyed by order of the proper State authorities as a protection to kindred interests in the State. The justice of the claim for complete reimbursement of loss is above question. It will I believe, be at once, conceded by the members of the legislature not only that the loss should be made good by the State, but also that such an amount additional should be appropriated for the farm as will enable the trustees to supply it fairly with representative breeds of stock. The second barn still unclapboarded should be finished outside, and a water supply, reliable at all seasons of the year be assured for the stock.

Other points relating to the farm requiring consideration will appear in the report of the professor of agriculture.

EXPERIMENT STATION.

The establishment of an agricultural experiment station as a department of the college with its running expenses provided for by the bounty of the general government is an event of great prospective importance to the farmers of the State and to our agricultural interests.

Time will be needed for the development of it to the plane of highest usefulness. The co-operation of all interested is also essential. As the full report of the station will appear elsewhere, it is only necessary here to state that every dollar of money appropriated for the former (State) station received by the college when that station was abolished, has been sacredly devoted to the new station, and thus the construction of the station building has been made possible.

In arranging the building for the work to be done in it, the policy has obtained of equipping with appliances and apparatus in a thorough manner, in the belief that the best equipments for scientific work are in the line of true economy.

VARIOUS TOPICS.

During the past year, especially, the Young Men's Christian Association has been a force in the college whose influence for good has been clearly apparent. The generally high moral tone of the students has been a matter of observation and of commendation.

The pleasant and spacious room in Coburn Hall now used for chapel services is very fully appreciated. An Estey organ has been placed in the room by subscription of the students, faculty and others.

The Coburn Cadets accepted an invitation from the officers of the Maine State Agricultural Society to attend the recent State fair at Lewiston, and passed four days very pleasantly on the fair grounds. Acknowledgment is made to Payson Tucker, Esq., General Manager, Maine Central Railroad, for providing free transportation of the Cadets to Lewiston and return.

WANTS AND ESTIMATES.

The first obligation to be met is clearly the cancelling of indebtedness arising from the destruction of the herd in 1886, for which a loan of $6000 had to be made. As the interest on this loan has been paid from current funds the amount to be asked for on this account is $6000.

The estimated cost of clapboarding and painting barn No. 2, with some other repairs essential also for its preservation, is $500.

The question whether the farm should be carried on without stock for longer time than that which the force of calamity has already compelled can hardly be regarded debatable. To fairly re-stock the farm with good types of representative breeds will require $2000. The estimated expense of securing running water for the herd is $500 which added to the other sums named makes the amount for the indebtedness of the farm and for its needs $9000.

The other wants of the college, I am glad to say are largely wants arising from or compelled by its prosperity. With increasing demands upon the several departments of instruction arise new necessities for space and for appliances, if the present and prospective demands are to be reasonably met. Coburn Hall provides ample space for two departments. The appropriation made for it sufficed for the construction of the building but not or only in part for the cases and other interior fittings. The cost of the cases, tables and other fittings above what was covered by the appropriation so far as that work has been carried is $2100. The cases needed immediately in the library will cost $350. In the audience room in the third story of the building are some inexpensive chairs obtained for use at its dedication but not at all in keeping with the building or the room in which they are placed. The proper and permanent fitting up of this room will cost about $850. The estimated expense of gas fixtures and the supplying of the building with gas for two years is $300. This expense is much smaller than it would otherwise be were it not that Coburn Hall is connected for its gas supply with the experiment station. The several sums enumerated for Coburn Hall aggregate $3600. They are nearly all permanent items and once provided for, will not have to be duplicated. The renovation of the library brings into form for binding, particularly for completing sets of books and periodicals, some four hundred volumes. For several years the accessions

to the library have been slight. For periodicals, binding and for new books the sum of $1200 is desired.

In the way of apparatus the amount asked for by the several departments is essentially the same as that asked for two years ago, with the exception that for the department of Natural History a larger sum is needed, and for equipping, in part, the physical laboratory not less than $2000 will be required. Specifically for apparatus the following amounts should be provided for the several departments, viz: Agriculture, $250, Natural History $1000, Chemistry $350, Civil Engineering $200, Mechanical Engineering $200, Military Department $100; Physical laboratory $2000; the several sums aggregating $4100.

As shown by the reports of Prof. Flint and Mr. Webb there will be needed for the shop additional forges costing $140, drawing tables costing $120, sheathing of room $60, water supply $100, and drainage $100, making a total of $520.

For the department of Civil Engineering, twenty-six additional drawing tables will be needed to accommodate the classes of next term. These tables will cost $200.

In the way of repairs I desire to call attention to the necessity of building over the north cellar wall and other portions of the foundations of Wingate Hall, the expense of which is estimated at $300. In the chemical laboratory the steam-heating apparatus has never been satisfactory. In fact, for years, the larger part of the heat for the building has been secured by stoves. At an estimated expense of $300, it is believed that the steam-heating apparatus can be put in such condition that the building can be warmed by it. The plastering of the analytical laboratory falls frequently in considerable masses and the restoring of it each time is attended with considerable expense. For $100 it can be taken down and the ceiling can be sheathed. Besides improving the room it would be an item of economy. Other renovations in the laboratory, needed for several years, can be made for $200.

I am confident that any legislative committee on examination will say that the boarding house and the wooden build-

ings connected therewith should receive repairs amounting at least to $300. For other necessary repairs my estimate is $300. These several items under the head of repairs aggregate $1500.

The road laid out in front of the experiment station extending to the boarding house should be made next season. The construction of this road envolves the building of one stone culvert. Gravel is needed for roads and paths and especially for extending the gravel walk, generously made by the town of Orono from the village to the college line, so far as to connect with the gravel walk on the college premises which now terminates at the old farm buildings. For these and other desirable improvements on the college campus, definitely presented in Prof. Hamlin's report, $1000 will be not more than adequate. I have been somewhat particular in the enumeration of needs thus far made with a desire of rendering easier the task of a legislative committee in its examination into the wants of the college and also that nothing of importance shall be overlooked. In the line of permanent progress, I desire to ask attention to still other needs.

In the analytical laboratory the pressure for space is greater than ever before. Within the past year we have been obliged to decline to receive special applicants for privileges of the laboratory and the class in mineralogy has no place for practical work. By elevating the roof of the analytical laboratory the desired room can be obtained which can be fitted up and used as a permanent mineralogical working room. The estimated cost is $1000.

In the mechanical department instruction is now given in filing, forging and in wood working. To complete the original plan of shop instruction, metal working should be added. To fit the lathe room with lathes and planers $4000 would be needed and for the foundry $1000 would be required.

Hitherto little attention has been given to practical horticulture. Is not the time propitious to establish in connection with the experiment station an horticultural department? If I regard this subject rightly, provision should be made for

erecting a green-house and for developing a department of practical horticulture within the next two years.

For the experiment station building no provision was made by the last legislature. With the amount that could be drawn from the national appropriation for this purpose and the amount realized by the college from what had been assigned to the former station a building admirably adapted to the work in hand has been constructed. For this building completed, it will be necessary to ask of the State but $400.

Last but not least in importance, it will be necessary to ask for a sum sufficient to cover the travelling expenses of the trustees and to cover insurance of the buildings. The former item will be $500, the latter $750.

A condensed summary is herewith presented.

For the farm, including indebtedness	$9,000 00
Coburn Hall, including cases, chairs, lighting, &c	3,600 00
Experiment station	400 00
Library, including periodicals, binding, &c.,	1,200 00
Apparatus for the several departments.....	4,100 00
Shop, including drawing tables, forges, sheathing, &c	520 00
Department civil engineering, drawing tables,	200 00
Repairs and improvement of grounds.....	2,500 00
Mineralogical room in laboratory.....	1,000 00
Travelling expenses of trustees.....	500 00
Insurance of buildings.....	750 00
Mechanical department, lathes, planers, foundry	5,000 00
Department of horticlture, greenhouse, &c.,	3,000 00
	$31,770 00

In Professor Hamlin's report the subject of a more general water supply system embracing all the buildings, including the experiment station, the water that will be needed for horticultural and all other purposes, except hard water for drinking purposes, is quite fully discussed.

If such plan shall be adopted, the money now devoted to insurance could, in part, be saved, and that asked for supplying water to the farm could be assigned to the general water system, and thus a part of the necessary expense would be covered. The general system will doubtless soon be a necessity. If adopted, a sufficient sum to cover the expense must necessarily be added to the above estimates.

Provision made for the foregoing items will secure a fulness and completeness in several lines of instruction such as has been impossible in the past. A State educational institution can only afford to do a high quality of work, and such quality implies a high grade of appliances with which to do, and such appliances imply money. Means much ampler than those possessed by this college, and funds much larger than have ever been asked for on its behalf, could be most advantageously employed in giving it greater efficiency and wider usefulness.

FIXED ANNUAL APPROPRIATIONS.

Before dismissing the subject of college finances I beg to direct attention to the desirableness of fixed annual appropriations.

As shown elsewhere in this report, the State of Kentucky provides for her college $16,000 annually, and Colorado levies a tax of one-fifth of a mill to the dollar on all taxable property in the State for her State college. With an assured income, permanent plans can be made, as they cannot be when an institution is dependent upon variable annual or biennial appropriations. The Maine State College has demonstrated in its twenty years' history its right to be, performing as it does a service along practical lines, undertaken by no other institution in the State. It has received the fostering care of the State and may reasonably expect a continuance of it. It is a question worthy of consideration, whether the time has not arrived when the obligation or bounty of the State should manifest itself in a generous and permanent annual assignment of money to the college. This

would be equivalent to enlarging its endowment, a condition or result much to be desired. Personal benefactions could then be devoted to special objects, and for such objects they are most likely to be given.

The sum of fifteen thousand dollars per annum permanently assigned, would be much more valuable than a larger sum contingent upon conditions which are constantly varying.

It is not my purpose, however, so much to name a specific sum as to present and urge the value of an adequate permanent annual assignment.

CONCLUSION.

The advances made during the past two years have been sources of rejoicing to the friends and supporters of the college. These advances have been of a substantial character. The appreciative and liberal action of the last legislature rendering this progress possible, has been, therefore, a source of great satisfaction. It has been pleasing, moreover, to note evidences of a growing sentiment of favor toward the college throughout the State and a more just appreciation of its work.

It will, I am confident, be the continued effort of all who hold positions of trust and responsibility in connection with it, to render it still more worthy of the confidence and support it seems to be winning, of the State whose honored name it bears, and of her generous aid, by which alone its highest usefulness can be assured.

Respectfully submitted,

M. C. FERNALD, *President.*

COBURN HALL.

Department of Agriculture.

President M. C. Fernald:

The transfer of the agricultural department from one room in the chemical laboratory to the commodious apartments in the building erected last year for the Departments of Agriculture and Natural History is a move which we believe will widen the scope and increase the usefulness of the agricultural course. The cabinet is proving to be as valuable an acquisition for purposes of instruction as the most sanguine expected. The basement of the building which has been devoted to a permanent exhibition of agricultural tools and machinery is well adapted to this purpose. A few articles are already on exhibition there, while many more have been promised. It is believed that the manufacturers of such goods will find it for their advantage to patronize the exhibition, as no better means can be offered for advertising a meritorious machine or tool than by displaying it here where it will be seen by the many progressive farmers who visit the college annually, beside being made an object of special study by the agricultural students.

The advantage of such an exhibition to the college will lie in the means it offers of familiarizing the students with all of the most important implements used in New England agriculture.

During the year the course of study has been so modified, as to relieve me from giving instruction in physical geography. This arrangement gives me more time to devote to the department, and other changes that have been made will in the future allow the agricultural students to devote more time to the technical studies of their course.

Additional work has been assigned me in the experiment station. As there is connected with the college experiment station a competent veterinary surgeon, Dr. F. L. Russell. I would suggest that arrangements be made by which the agricultural students may receive instruction from him in veterinary science. Such an arrangement would be of great practical advantage to the students in that they would receive instruction from one who has thoroughly fitted himself for this special work.

In previous reports I have urged the establishment of a department of horticulture in the college. With each year I become more thoroughly impressed with the desirability of developing the agricultural course in this direction. It requires considerable capital to establish a young man in the business of general farming; more indeed than a large majority of those who graduate from this institution can command on commencement day. There are, however, various lines of work in the direction of horticulture where a small investment of capital together with a fair amount of business ability, skill and intelligence yield comparatively large returns. Maine has a large area of land along her railroads and near her villages and cities adapted to market gardening, and there seems to be no good reason why such places as Bar Harbor and Old Orchard should draw their supplies of fruit and vegetables from Boston when they can be produced of better quality and delivered in a fresher condition by citizens of this State. I believe that the establishment of a horticultural department would not only aid greatly in the development of horticulture in this State but would draw many students to the agricultural course who are deterred from pursuing agricultural studies on account of the capital required to start in business.

The prize offered by the Hon. Samuel Libbey for the best essay on an agricultural topic to be presented at commencement each year, was competed for by five students who presented essays of a high degree of merit. The prize was

awarded to Fred Percy Briggs. Subject, Agricultural Education. The same essay was also awarded the Junior prize for excellence in composition.

It is to be hoped that other friends of agricultural education will be induced to offer prizes in this department, as the "Libbey Prize" has called out extra effort in the direction of special study.

On April 15th, 1887, the college farm was placed under my charge and made a part of the agricultural department of the college. Through the failure of the legislature to make an appropriation to pay for the stock destroyed by the order of the State Cattle Commissioners on Contagious Diseases, the trustees of the college decided not to re-stock the farm. Hence no attempt has been made to do more than to cut the hay and care for the property on the farm. This course, however, if continued much longer will bring neither credit nor profit to the institution. Some measures should be taken as soon as practicable for placing the farm on a sound business basis, so that it may serve as a model of business farming for our students.

There are but few operations on the farm requiring skill in the direction of manual labor in which the students coming to us from country homes have not served an apprenticeship of ten or more years. This, it seems to me, is a sufficient training in the direction of dexterity in the handling of ordinary farm tools and machinery. It is an apprenticeship more than three times as long as any required in the trades.

I think we can take it for granted that our freshmen understand these things about as well as the instructor in charge of the department and that the time required of them in performing ordinary farm labor can be more profitably employed. There is, however, much to be learned in the direction of business methods in farming, for all students, on a well conducted farm; such as the application of the principles of feeding and manuring that they learn in the class-room, the marketing of farm products, the methods of handling different soils, etc., and some few operations requiring manual skill

and a practiced eye such as conducting dairying operations. The farm should be made to subserve this purpose and the agricultural students required to have a tolerably definite knowledge of the work in progress on the farm, and the object of each operation.

We have on the college grounds a market for $1500 or $2000 worth of farm products at fair prices and all surplus products can be disposed of in the neighboring city. There seems to be no good reason why the college farm should not supply the needs of the college boarding house so far as it is capable. Outside of this the college farm should take the lead in experimental farming and in determining to what extent the scientific facts brought out by the investigations of the experiment stations are applicable to ordinary farm work.

To attain the first object of making the farm serve the purposes of instruction in furnishing object lessons in good farming, there will be needed a good practical farmer who shall take part in and see to carrying out the details of the farm work. A sufficient amount of dairy stock should be provided to supply parties living on the college grounds with milk and butter. This stock should represent as many different breeds as possible in order that our students may have constantly before them the different types of dairy animals for study and comparison. Representative animals of the beef breeds should also be kept on the farm for purposes of illustration.

In providing for the re-stocking of the farm the trustees should not neglect to take into consideration such stock as horses, swine, sheep and poultry. These all have their place in the economic questions of the farm and when properly managed may all prove profitable. The farm fulfilling its mission of furnishing a model of business farming should be self-sustaining. If it is to undertake experimental work as indicated above, funds must be supplied from some source for the work.

When the farm is re-stocked, provision should be made for the introduction of running water into the stables, as it will much lessen the cost of caring for the animals, besides furnishing a more healthful supply of water than can be procured by storing rain water in cisterns. For this purpose at least $500 will be necessary.

The attention of the trustees should be called to the condition of the "New Barn" which has stood unfinished for over three years. To clapboard and paint this barn and point the walls will cost $500. This should be done in the interest of economy as it is necessary to protect the building from decay.

There are about 200 acres of land on the east end of the college farm, partially covered with timber, wood and bushes which, if fenced, would furnish pasturage for 20 head of cattle through the entire summer season, as a considerable portion of this land was formerly cleared and seeded to grass. It would require about one ton of wire to build that portion of fence which would lawfully fall to the college to construct. Posts and top rails could be procured on the farm. This pasture will be necessary if stock is to be kept. In any case an income could be derived from this land if fenced.

The college farm has been presented with a Bradley mower No. 6. A six-foot, side cut machine having 36-inch wheels and 4½ foot axle, was presented by the manufacturers, Bradley & Company of Syracuse, N. Y. The machine is thoroughly constructed, light of draft, easily handled and does good work. It is a practical machine on a large majority of the farms in the State. Much of the land on the college farm is bedded up. This machine has been run both lenghtwise and crosswise of these beds without injury to the machine or driver, and has done as good work as could have been performed with a 4½ foot cut.

The Eureka Mower manufactured by the Eureka Mower Co., was presented to the farm by B. Walker MacKeen of Fryeburg. The Eureka is a six-foot center cut machine, with a 40-inch wheel and a six-foot axle. The cutter bar is directly in front of the wheels, which makes it necessary for

one horse to walk in the grass, which, by some, is considered an objection. The draft of the machine is as light as can be desired. It has been purposely run in the roughest places on the farm during the past season and has done good work and suffered no injury. The machine deserves more popularity than it enjoys. It could be much improved by the addition of an arrangement for tilting the guards up and down.

The Eclipse Corn Planter, manufactured by the Eclipse Corn Planter Co., Enfield, N. H. was presented to the institution through their agent, B. Walker MacKeen of Fryeburg. The machine is just what its name indicates. After the ground is fitted, this machine with a horse and a man furrows out the grounds, drops the seed and fertilizer and covers them all at one time. It can be so adjusted as to drop the corn automatically from six inches to thirty-six inches apart, dropping from one to many kernels in a hill at the will of the operator. By marking the ground beforehand the machine can be made to plant in checks or squares of any distance so that the corn can be cultivated both ways. The fertilizer is evenly distributed and the amount applied is easily adjusted.

An Acme Pulverizing Harrow and Clod Crusher has been sent to the college for exhibition with the request that it be given a thorough trial on sod land. The harrow was used in fitting one and one-half acres of sod land for potatoes which had been ploughed the day before. The work was performed as well as could be desired.

The management of the farm during the past year has been what we were forced to make it without stock. There has been only about six acres in crops, the remainder of the farm has been in grass. The amount of hay produced on the farm was 155 tons against 200 tons last year. The falling off is in part due to the season and in part due to the lack of fertilizing material. An acre and a half of land was planted to potatoes with commercial fertilizers and there were harvested from this area 350 bushels which is probably not more than three-fourths of what would have been produced if they had

not been cut down by frost while in blossom. About four acres and a half of pasture land was well manured with stable manure and sown to oats. Owing to the drought in the spring the crop was light, 170 bushels.

The Percheron stallion Bayard, leased of Houghton farm, Mountainville, N. Y., has been well patronized and though the expenses have been heavy he will probably pay for his keeping and will be retained for another season unless otherwise ordered. Other stock consists of two brood and working mares with foals by their sides after Blaisdell and Folsom's registered Percheron horse Capt. Pully; two Jersey bulls, one two years old, a grandson of the famous cow Eurotus, which was presented to the college by Houghton farm, New York; the other an eight months Comassie bull presented to the college by Mr. John R. Brewer of Hingham, Mass. Both of these bulls are fine animals and ought to be doing the college farm and the State at large some service. There is also a small flock of eleven Shropshire ewes not registered and one registered buck and two buck lambs. The above-named animals with one White Chester sow comprise the live stock of the college farm. During the year ending with April 15th, 1888, the receipts of the farm exceeded the expenditures by $363.91. During the present year the farm will probably pay all expenses and have a similar balance in its favor.

Respectfully submitted,

WALTER BALENTINE.

Farm Inventory, December 1, 1888.

LIVE STOCK.	
HORSES.	
1 Percheron-Norman stallion.	
1 Pair mares, 7 years old	$400 00
2 Colts	150 00
CATTLE.	
1 Jersey bull, 2 years old	75 00
1 " 9 months old	50 00
SHEEP.	
1 Shropshire buck, 3 years old, registered	35 00
1 " ewe, 5 "	15 00
1 " " 3 "	15 00
3 " ewes, 2 "	45 00
4 " " 1 year old	60 00
2 " ewe lambs	20 00
2 " buck lambs	15 00
SWINE.	
1 White Chester sow	15 00
FARMING TOOLS AND IMPLEMENTS.	
VEHICLES.	
1 Farm wagon	50 00
1 " with hay-rack	25 00
1 Hay-rack with wheels	25 00
1 Two-horse dump-cart	25 00
1 Single " with forward wheels	20 00
1 Light express wagon	15 00
1 Double-seated pung	25 00
1 Pung, old	5 00
1 Road cart	30 00
MACHINERY.	
1 Bradley Mower, No. 6	50 00
1 Eureka "	50 00
1 Champion Mower, old	25 00
1 Eclipse Corn Planter	25 00
1 Mudgett Hay Tedder	25 00
2 Double harpoon hay forks, with carriers, ropes and pulleys,	20 00
4 Sward plows	40 00
1 Sub-soil plow	10 00
1 Fillibrown Harrow	6 00
1 Randall "	20 00
1 Thomas Smoothing Harrow	15 00
1 Potato digger	8 00
1 Kemp Manure Spreader	50 00
1 Winnowing machine	10 00
1 Queen of the Harvest Seed Separator	10 00
1 None Such Hay Cutter	3 00
1 Peerless Corn Sheller	1 00
1 Planet, Jr., Planter	3 00
1 Mathew Seed Drill	1 00
1 Planet, Jr., Cultivator	5 00
1 Corn planter	10 00
1 Root cutter	5 00
1 Feed truck	3 00
7 Scythes with snaths	3 50

Farm Inventory—Concluded.

5 Drag rakes	$1 00
8 Hand rakes	75
3 Cant-dogs	3 00
1 Barrel lifter	50
1 Bush scythe and snath	1 00
1 Stone hoe	25
7 Hay forks	1 75
4 Manure forks	1 00
2 Iron rakes	1 00
4 Potato hooks	1 00
1 Hay knife	1 00
1 Spading fork	75
2 Barn hoes	50
2 Axes	1 00
2 Iron bars	2 00
1 Shuffle hoe	45
1 Steelyard	1 50
1 Platform scale	5 00
1 Bull staff	50
2 Feed baskets	1 00
2 Grindstones	3 00
1 40-gallon boiler	3 00
1 Harness	45 00
1 "	20 00
Dairy apparatus	100 00
Household furniture and furnishings	350 00
PRODUCE.	
100 tons of hay	1,300 00
170 bush. oats	76 50
300 bush. potatoes	150 00
80 lbs. wool	20 00
LUMBER AND WOOD.	
9 M. cedar shingles	20 00
11 cords wood	27 50
Total	$3,653 45

Summary of Farm Inventory.

Live stock	$895 00
Farming tools and implements	714 45
Dairy apparatus	100 00
Household furniture and furnishings	350 00
Produce	1,546 50
Lumber and wood	47 50
Total	$3,653 45

Department of Natural History.

President M. C. Fernald.

DEAR SIR: The following report of the department of natural history for the two years ending November 27, 1888, is respectfully submitted. Since my last report marked improvements have been made in this department.

The erection of Coburn Hall greatly increases the facilities for studying natural history. The new courses of study adopted, provide for far more extended museum work and laboratory practice.

The material belonging to the department, together with the mineral and geological specimens, were transferred to Coburn Hall during the last summer vacation. Since the collections were transferred we have been steadily at work classifying and arranging them for study and exhibition. Mr. Briggs has rendered efficient aid in this direction.

The mineral and rock specimens have already been registered and arranged according to Dana's system. Herewith is presented a manuscript catalogue of them to be published as a bulletin from the department. Considerable preliminary work has been done on the geological and biological material. The herbarium has been carefully studied and the nomenclature revised to date.

The new building has been occupied the last term for recitations and laboratory work.

The Sophomores have practiced in the laboratory two afternoons each week. Their work has been: (*a*) Study of the compound microscope. (*b*) Methods of making sections and slides. (*c*) Dissections, drawings, descriptions and

classification of types of the important orders of cryptogams. (*d*) A study of the grass family, and a comparison of grasses, sedges and rushes. (*e*) Methods of preparing cryptogams for the herbarium.

The Freshmen in physiology have had occasional meetings in the laboratory during the last term, to examine objects with the microscope; study dissections of lower animals and consider other matters pertaining to human physiology. The Seniors in comparative anatomy have occupied the laboratory, to witness dissections of vertebrate type specimens and to study models.

The introduction of laboratory practice has already shown good results in more thorough scholarship. It has been a pleasure to notice a disposition on the part of some, to exceed the requirements and do original work. The most of the students have made good use of their opportunities. In cryptogamic botany we have used Bessey's Advanced Botany as a guide, supplementing it by lectures and monographs, in laboratory practice and classification. The laboratory work has been in charge of the Professor of Natural History. The text book work, in all the departments, has been made as practical as possible, by using specimens and requiring their examination by the students in the class-room or laboratory.

ORIGINAL WORK.

Research for material to illustrate the work in natural history has added some new facts regarding the flora and fauna of the State.

Some results of research have already been given to the periodicals on natural history.

But little is known about most of the lower forms of life in the State, and special study is given to some of the groups.

It is designed to publish from the department, some time in the future, a catalogue of the natural objects of the State, and to this end data and material are being collected. Several hundred specimens of Maine fungi have been collected

the last season for fascicles of North American fungi distributed by Mr. J. B. Ellis, of Newfield, N. J.

Quite a number of letters asking information about objects of nature, have been answered.

ACCESSIONS.

The collections have slowly increased during the last two years by donations from students and other friends of the college, and by purchase.

The collection of birds and minerals bought of Mr. Osgood, contains many fair specimens; some rare species; and the most of the material can be used for educational purposes.

The appropriations made two years ago have been used to meet current expenses and procure needed appliances.

We would respectfully solicit donations of natural history, mineral or geological specimens for the cabinets, assuring those who send *desirable* material, that it will be properly placed on exhibition, and full credit given in the register and on the labels.

To such as send a sufficient amount of material a special case or space will be assigned. After the collections on hand are properly registered, we hope every two years to publish a catalogue of the accessions, giving full credit to donors.

ZOOLOGY.

Most of the type animals referred to in our text-books can not be illustrated for want of specimens.

We need models, or alcoholic preparations of the perishable forms, and mounted specimens of the others. There should be a full collection of the animals of Maine in the museum, but at present we have only a small per cent.

Type animals not found in the State should also be in the museum.

ENTOMOLOGY.

The entomological cabinet of the college is arranged for the purposes of classification; but a collection for studying economic entomology is needed, where the injurious insects affecting each farm crop are grouped together with their enemies, and their injuries. A case and material for forming such a cabinet are needed; also supplies to extend the general collection of insects.

PHYSIOLOGY.

We have no models of the nervous, respiratory, circulatory, digestive, and excretory organs in man. This department should have a complete manikin, which would cost seven hundred and fifty dollars, duty free. This important subject should be thoroughly taught for its practical bearing on health; also, if properly illustrated it lays a good foundation for zoology and comparative anatomy. We dissect only lower animals, and models of the human body are indispensable.

BOTANY.

The new herbarium case will have to be fitted with genus covers, boxes and labels. Additional implements and supplies will be needed for practical laboratory work. Specimens not otherwise obtainable will have to be purchased. The collection of North American fungi offered for sale by Mr. J. B. Ellis of Newfield, N. J., should be purchased at once as only two collections are now available.

MINERALOGY.

There are quite a number of entries in the mineral cabinet, but very few well crystallized specimens. It is hard to get good specimens without buying them, as mineral localities are usually leased to dealers. There should be in the cabinet a representative specimen of each important mineral species. Practical work in descriptive and determinative mineralogy is done, requiring chemicals and apparatus.

GEOLOGY.

Models, rocks, fossils and casts of fossils are indispensable, if this interesting subject is practically taught. Most colleges have a set of Ward & Howell's casts, costing from one thousand to three thousand dollars and regard them indispensable. The college has but little with which to illustrate this subject.

MICROSCOPES.

We have only one compound microscope for each three students doing laboratory work. There should be at least one for each two. Most colleges assign an instrument to each laboratory student and hold him responsible for its proper use.

BOOKS.

Tryon's Conchology, subscribed for, has to be continued. Several special books on Cryptogamic Botany are absolutely necessary to do the elementary laboratory work. We need Kingsley's Riverside Natural History and several other reference books not in the library.

MUSEUM.

A general museum is a great attraction to visitors and also a constant educator of students during their course at college. A good museum frequented by students for four years is almost equal to a liberal course in Natural History. Students have a right to expect that specimens, to properly illustrate the studies taught, will be provided.

Jars, alcohol, trays, labels, &c., are constantly needed to preserve and display specimens. There are also other expenditures connected with augmenting and caring for collections.

REMARKS.

We have pointed out the pressing needs of the department, but believe it would be a wise policy on the part

of the State, to appropriate *at once* enough to purchase all needed appliances for a thorough course in natural history.

In the summary below there has been indicated a small sum for each line of research—an amount considered necessary to keep the work of the department moving.

In considering the wants of this department it should be remembered that four distinct lines of research: botany, zoology, mineralogy and geology and the special branches emanating from them are included, each of which should be properly illustrated by specimens and enforced by laboratory practice.

APPROPRIATIONS.

Zoology—Specimens and supplies	$150 00
Entomology—Case and supplies	50 00
Physiology—Models and supplies	100 00
Botany—Specimens and fitting cases	100 00
Mineralogy—Specimens and supplies	100 00
Geology—Models, casts, rocks and fossils	100 00
Microscopes—For use in all departments	100 00
Special books for library	100 00
Museum—Jars, alcohol, trays, etc	200 00
Total	$1,000 00

Respectfully submitted,

FRANCIS L. HARVEY,

Prof. of Natural History.

Department of Chemistry.

President M. C. Fernald:

During the past two years my hours of class-room exercises and of laboratory work have been about the same as heretofore. Three hours of every forenoon during the fall term have been devoted to recitations, namely: The senior class in advanced chemistry, the junior class in advanced chemistry and the sophomore class in general chemistry. Our new text book in this study, Remsen's chemistry, is, as might be expected from its author's reputation, the best work of its kind for beginners.

Besides these recitations the sophomore class, with the exception of the students in engineering, have performed a series of elementary experiments illustrating the principal facts of the science.

My forenoons during the spring term were devoted to a class in advanced chemistry—to the senior class in quantitative analysis and the sophomore class in qualitative analysis, these classes worked two hours in the laboratory.

The afternoons of both terms are devoted to analytical work by the junior and senior classes and by special students who may wish for such a course.

I have adopted Appleton's quantitative analysis for beginners in laboratory practice and find that it saves much time and labor both to the instructor and student as each step is minutely described and thoroughly explained. By adopting this hand book I expect that the students will be able to perform a greater number of analyses and understand the methods better than by the use of a more advanced text book.

After taking a thorough course in simple determinations they will undertake the analysis of more or less complex compounds. As a guide for such work I propose using Classen's quantitative analysis, translated by Professor Smith. Though I have discarded Fresenius' system of quantitative analysis as a hand book for laboratory work it will still be retained as a valuable book of reference.

At the commencement in June 1887, the following students of the course in chemistry took the degree of Bachelor of Science. The titles of their theses are given after each name.

David Wilder Colby, explosives; John S. Williams, manufacture of wood pulp by the alkaline and acid processes. At the commencement in June 1888 the following students graduated from the chemical course:

John Russell Boardman, the adulteration of drugs.

Francis Stephen Brick, quantitative analysis by electricity.

Harry Butler, a pharmaceutical assay of Cascara Iagrada.

Harry Foster Lincoln, albumen and sugar in urine.

Ralph Hemenway Marsh, chemistry of the blood.

Nathaniel Estes Wilson, the digestibility of common meats.

The laboratory and class room work done by the students under my instruction has, on the whole, been satisfactory.

I expect chemical students hereafter to perform a larger number of analyses, from the fact that the senior class will occupy the room now used by the experiment station. This will be fitted with a small steam boiler, steam baths, steam oven, filter pumps and other conveniences which will greatly shorten many of the ordinary operations of quantitative analysis.

The last appropriation obtained by this department was mostly devoted to the purchase of a larger stock of chemicals, common glassware, porcelain ware, as well as some graduated apparatus. We have heretofore suffered from a lack of a fair supply of the ordinary forms of apparatus; this has been a barrier to rapid work on the part of the students; by supplying them with a more complete set of apparatus for quantitative analysis, I have been pleased to find that the

amount of work done was considerably greater than before and of, at least, as good a quality. Two new balances were also obtained for the department. Nearly all of the above apparatus was imported from Europe, duty free.

In order that the department may continue to make proper advances some apparatus of a more special kind should be added to its present equipment. The following pieces seem absolutely necessary, namely : a good laboratory spectroscope, some simple apparatus for gas analysis, apparatus for organic analysis, for fat extraction, for carbonic acid determinations, for the determination of density of gases according to Chancel, some Gooch crucibles, more graduated ware, some additional platinum ware, &c. It will be necessary to make some alterations, buy steam cups and steam oven for the room now occupied by the station in order to properly fit it for the use of the senior students in quantitative determinations. One hundred dollars will probably not more than cover the necessary expenses, besides which a sum of at least $250 should be expended in the purchase of improved and special apparatus.

Our classes are growing larger every year so that it becomes necessary to have on hand not only a large assortment of the more common forms of apparatus, but also duplicates of some that are more expensive. Analytical chemistry is continually making progress, so that, a laboratory to be fairly well equipped in modern and improved apparatus must have yearly additions made to its stock.

Respectfully submitted,

A. B. AUBERT,

Professor of Chemistry.

Department of Civil Engineering.

President M. C. Fernald:

The following report concerning the Department of Civil Engineering is respectfully submitted.

The work assigned to this department is shown by explanatory and tabular statements on pages nineteen, twenty and twenty-one of this catalogue.

This work has been accomplished in a satisfactory manner by the classes pursuing this course, and especially during the first year, as we have been able to do somewhat more in the line of field practice and designing than at any time in the past. This increase in our work has been rendered possible by the assistance which has been given me by Mr. Hart, who has shown himself to be an able and faithful instructor in those branches of study from this course, which he has taken. So I think I can safely say that the work done in this department has been more and better adapted to the practical wants of the great majority of the boys who take it, than at any time heretofore.

At the last session of the legislature an appropriation of four hundred dollars was made for this department to be expended in new apparatus. The principal piece of apparatus secured is an Ellis Current Meter of the most approved pattern and this has been very carefully noted here at the college, so that now I am able to give the boys practice with it in determining the volume of discharge of streams and rivers. Other small pieces of much needed apparatus have also been secured; and a portion of the appropriation also has been expended in the purchase of special technical books

of reference for the use of students in the course. Such books are an absolute necessity in carrying on our work and are too expensive to require the students to purchase for themselves.

Many improvements in methods and changes in the work done, are needed in the course in civil engineering yet, but we are prevented from making them at present on account of a lack of means and accommodations. One of our wants, which has long been felt and often brought to your attention in the past, is a new building in which the departments of civil and mechanical engineering may have suitable quarters. In the past our quarters have been small, and very poorly adapted to the demands of our work, but now a new difficulty presents itself. Our numbers are getting so large that we have not sufficient room, such as it is, and I hope you will impress upon the trustees the importance of providing a new and suitable building for the use of these two departments in the near future.

Much of my time and attention during the past two years has been devoted to the construction and planning of the water supply and drainage system, and superintendence of the construction of the new buildings.

And in this connection I will state, what to me seems to be some of the wants of the institution in this particular direction. All the principal buildings on the grounds are now connected with the main sewer leading to the river. The dwelling houses and farm buildings alone remain to be connected. These should be suitably connected with the river at once, in order that no part of the grounds shall become contaminated with the drainage from any of the buildings.

The water supply which was originally designed to furnish the institution with a supply of pure drinking water, the source of which should be absolutely free from danger of contamination, has now become of such general use, that neither the well, nor the pump, nor the tank, is of sufficient capacity to supply the constantly increasing demand for water.

Although this water is as good as can be found anywhere for drinking, it is not at all suitable for some of the many other uses to which it has been put. For instance, its constant use in the boilers of the steam-heating apparatus, in the various buildings will, in time, cause serious trouble and damage. For such purposes soft water, free from sediment, is required.

The experiment station, in the near future, will require a large supply of water, which, for its purposes, should be soft. There will also be a demand for a large supply of pure running water at the farm buildings, and all of the dwelling houses on the grounds should be connected with the system of water supply as soon as possible.

Finally, all of the college buildings, which are now so valuable, both on account of their own cost and the cost of the apparatus contained in them, and which, at present, are left entirely at the mercy of chance for protection from fire, should be supplied with water under sufficient head of pressure to thoroughly protect them from such danger. This would require at the buildings a pressure of from fifty to seventy-five pounds. This pressure could be supplied here only by means of a steam pump, as it would require a head of elevation of from 110 to 150 feet, and the ground is all of very moderate elevation in the vicinity of the college buildings. A steam pump, with a capacity for pumping from 500 to 700 gallons per minute from the river into a 6-inch main, passing near all the principal buildings, would furnish the requisite pressure, and give three or four good fire streams at any one time, which would be ample for fire protection, as the buildings are so far apart that no two would be likely to be on fire at one time, and also furnish an abundant supply of water for all other demands of the institution in the future.

As the care of the grounds about the buildings has been somewhat left to me in the past, I would respectfully call your attention to their present condition, and urge the importance of making a radical change in it as soon as possible. The natural beauties of our grounds are many, and very sus-

ceptible of artificial improvement. By constantly working in the right direction, and according to some well-considered plan, a moderate expenditure of money on the grounds each year for a few years to come, will enable you to change them from their present rough and unattractive appearance to a beautiful park, which would, at the same time, attract and instruct.

With the exceptions that a few trees have been planted, and a few absolutely necessary walks laid out, nothing whatever has been done towards the accomplishment of this object.

There are, I think, considerations of sufficient importance, even from a money stand-point, to induce the State to invest a small amount in this work, especially as these extensive grounds have been wholly given to the State.

There is no other way in which the farmers of this State could add so much to the value of their farms with the expenditure of so little money, as in the general clearing up and beautifying of their grounds. Why this is not done is not so much on account of the expense, because it could be done in such a way and at such times as to cost absolutely nothing, but because of the lack of a properly developed taste. Now there is no way to develop such a taste better than by association, and hence the grounds connected with an institution which is constantly educating so many of Maine's future citizens, and it is hoped farmers, should teach each and every one of its pupils a valuable lesson in this respect, by association during their stay at the college.

G. H. HAMLIN,

Professor of Civil Engineering.

Mechanical Engineering.

President Fernald:

After the much regretted resignation of Prof. C. H. Benjamin the management of this department was given to me, and during the past two years it has been my endeavor to carry forward the work as he had begun it. His leaving, however, unavoidably caused a serious break in the work he had so well under way. He was a ready and efficient worker and during his occupancy of the chair of mechanical engineering brought about many valuable improvements.

No changes worth mentioning have been made in the regular work except as the increase in the number of students has rendered it necessary. The greater part of the money appropriated for apparatus has been used in making various improvements in the shop which were considered indispensable. One of Brown & Sharpe's College Gear Models has been bought which illustrates nearly all the forms of gearing. A few books have also been bought and some drawing tables built.

There are still a few improvements which should be made as soon as possible; one of which is the extending of the water supply system to the shop. This is a daily necessity and should be attended to at once. At the same time connection should be made with the sewer to provide for drainage. Quite a number of reference books are very much needed.

Your attention is respectfully called to the necessity for more room. The time has now arrived when, owing to the increase in the number of students, the whole building is required for the branches of shop work now established.

To bring this about the rooms now used for recitations and drawing must be vacated and accommodations for that work be made elsewhere. It is, moreover, very difficult and at times impossible to conduct recitations in a building where there is necessarily so much noise, and the motion of the machinery causes it to shake so that good work cannot be done in the drawing-room.

In the room now used for draughting there is space for eighteen men; next term there will be thirty to accommodate. Thus it will be seen that twelve more drawing tables must be supplied. Since the drawing-room is now filled these twelve tables will have to be put in the vise shop, a place entirely unfitted for such work but the best that can be had at present. Better arrangements need to be made as soon as possible.

It would seem, since the civil engineering department is also crowded, that the best plan would be to have the recitation work and drawing of both departments accommodated by a building especially designed for the purpose.

Of the 114 students in actual attendance this term 78 have registered in the two engineering courses. From this it will be seen that 68 per cent of the students here are in need of more suitable rooms to work in.

The best method of heating the shop is a question which now demands attention. At present the rooms are all heated by stoves which, in such a building, are decidedly dangerous to say nothing of being unsatisfactory. The expense of wood might be saved by utilizing the exhaust steam from the engine which is running most of the time. The heat which is now wasted would be ample for this purpose. It is to be hoped that the method of heating by exhaust steam may be adopted.

The instruction in shop work has been under the care of H. S. Webb, B. M. E., for the past two years, and he has shown himself worthy of his charge. He has various improvements to ask for which are surely indispensable if the shop work is to maintain its standard.

The cost of the immediate necessities of the department may be roughly estimated as follows:

Water supply	$100 00
Drainage	100 00
Drawing tables	120 00
Reference books, papers, &c	100 00
Sundries	80 00
	$500 00

Respectfully submitted,

WALTER FLINT.

Shop Report.

President M. C. Fernald:

The number of students working in the shop during the past two years has been greater than ever before. This increased number has been accommodated partly by alternating with other work and partly by the purchase of extra sets of tools and the erection of new work benches. The work done has been of the usual kind and quality.

The additions to the machinery and tools have been; a feed water heater for the boiler, an exhaust fan for removing the smoke of the forges, an emery tool grinder, six sets of carpenters' tools and eight sets of tools for the vise shop. These additions have been necessary and have given satisfaction.

At present the vise shop is well equipped for work. The forge shop should be provided with at least four more forges and the necessary tools. The forges can be set up in the room originally designed for a foundry. By this addition all those taking forge work, can be worked at the same time, thus saving the expense of running the engine double time. The expense of this addition together with the necessary piping will be about $140.

The carpenter shop is well provided with tools but much more room is needed for working at the best advantage. The entire second floor of the main building is not too large for carpentry and wood turning. Next term it will be necessary to use the vise shop for a drawing-room for a part of the students. This room should be sheathed to make it at all comfortable during the cold weather. This can be done for

about $60. There are at present five stoves used to heat the shop. If instead of this the building could be heated by steam from the boiler it would be cheaper and very much safer on account of fire. It is necessary to run the boiler during a part of the cold weather on account of forge work and this would lessen the expense of heating.

Yours respectfully,

H. S. WEBB.

Report of Military Department.

To President M. C. Fernald:

SIR:—I have the honor to submit the following report of the military department.

I reported for duty at the Maine State College July 1, 1888, in compliance with paragraph No. 17, S. O. No. 89, dated Headquarters of the Army, A. G. O., Washington, April 18, 1888, relieving 1st Lieut. Charles L. Phillips, 4th Artillery.

The present organization of the Coburn Cadets is a battalion organization of two companies and a band, with a full complement of battalion and company commissioned and non-commissioned officers. I have found the discipline of the battalion excellent and the interest in military subjects of the first order. During the term, now closing, our drills have been mainly in the school of the company supplemented with a few battalion formations and dress-parades. The two companies are in excellent condition for any sort of field work.

During the period from September 11, 1888, to September 14, 1888, inclusive, the corps was encamped at the State fair grounds at Lewiston, Maine, where good progress was made in the various duties of camp life.

The corps was inspected October 22, 1888, by Capt. James Jackson, 1st Cavalry, U. S. A., Acting Inspector General, Department of the East. The appearance and manœuvers of the corps during this inspection were all that could reasonably be expected for the amount of drill, and the conditions under which the drills are made.

No rifle practice has been had this term, owing to the great amount of rainy weather which made it unsuitable to conduct such practice. The practice for the college year will, if possible, be held during the next term. It is impossible to over-estimate the benefits to be derived from this important instruction. Our rifle pit is out of order from the effects of frosts and the heavy rains. It will take a sum of about twenty-five dollars ($25) to put it in condition for work. There is also a small amount necessary to purchase targets and target frames. The amount of ammunition allowed by the United States government for practice is only one thousand rounds of ball cartridges per year. In view of all these circumstances, I would recommend that an appropriation of one hundred dollars be made for the military department, the balance not used in repairing pit to be used for the purchase of ammunition.

A slight change has been made in the uniform since the last report was submitted; namely, the substitution of light blue pants with gold braid stripe for the grey pants, with black cloth stripe. It should be the policy, I think, to have the uniforms subject to few changes. It is now, in my opinion, satisfactory, and the changes needed in the future, if any, will be few and slight.

Theoretical instruction in Upton's United States Infantry Tactics has been commenced for the junior and sophomore classes, and will be continued the coming term during the time unsuitable for outdoor drill.

Unusual interest was awakened during the latter part of the term, due to a competitive drill which took place at Lewiston, November 15th, between the Nealey Rifles, Co. D, 2nd Regiment, M. V. M., and Co. A, Coburn Cadets. The conditions were that a picked squad, consisting of a captain, two guides and sixteen men, should drill before three regular army officers, as judges, for the championship of Maine. The decision of the judges was in favor of the Coburn Cadets.

In addition to my military duties, I have during the past term, instructed in Analytical Geometry the members of the junior class who take the course in Civil Engineering.

Very respectfully,

Your obedient servant,

E. E. HATCH,

2nd Lieut. 18th Infantry,

Prof. Mil. Science and Tactics.

Report of Library.

It gives me pleasure to be able to report that the library has been moved from its crowded quarters in the chemical laboratory to new and commodious quarters in Coburn Hall where it is being catalogued, classified and arranged, in a manner to make it of the greatest use to the faculty and students, by Miss Hattie Fernald, a graduate of this institution as also from the school of Library Economy, Columbia College. The college is fortunate to secure the services of one so well qualified to do this work. The system of classification adopted by Miss Fernald is that known as the Dewey decimal system, and the work is being carried on in a manner to interfere as little as possible with the usefulness of the library while the work is going on; the library having been closed to the students only a few weeks at the beginning of this term.

There are now on the accession list 4,440 volumes of bound books belonging to the college library and 400 volumes which belong to the experiment station. There are also 375 volumes of unbound books which should be bound at once in order that they may be catalogued with the others and rendered of service to the institution. There are several hundred volumes of pamphlets which should be provided with cases in order that they may be readily accessible, and there are about 400 volumes of duplicates in the library. The books belonging to the experiment station are not allowed to be taken from the room except by officers of the institution but the students are allowed to use them as freely as the

others in the room, so that the whole number of volumes to which the students have access is 5,215. All the book stacks in the library room are now full and early next term three more should be provided. There is also a constant demand for books which are not in the library and while we do not expect sufficient funds to purchase every work that is called for, yet there should be means at the disposal of the librarian to enable him to purchase those books which are repeatedly called for by the various departments.

A few years ago when it was proposed to erect a building especially for the library, Senator Hale gave one hundred dollars towards the building. The money was placed at interest and on the completion of Coburn Hall it was used towards furnishing the library room and as it has never before been acknowledged, I am happy to acknowledge it here and to render an account of its use.

G. H. HAMLIN, *Librarian.*

TREASURER'S REPORT.

To the Trustees of the Maine State College of Agriculture and the Mechanic Arts:

GENTLEMEN:—I herewith submit my annual report of the receipts and expenditures for the College during the past year.

RECEIPTS.

GENERAL ACCOUNT.		
Cash on hand, December 8, 1887	$5,048 26	
State appropriation for new building	10,000 00	
" " " Instructors	2,000 00	
" " " Apparatus	1,000 00	
" " " Insurance	300 00	
" " " Trustee expenses	250 00	
" " " Repairs	500 00	
Interest from State of Maine bonds	7,098 00	
" " Lombard Investment Company bonds	183 00	
" " City of Bangor bonds	180 00	
" " Security, Loan and Trust Company bonds	43 02	
" " Coburn estate (bequest)	4,000 00	
Tuition of students	3,155 00	
Experiment station, amount refunded for bills paid from Oct. 1, 1887, to Dec 31, 1887	932 78	
Experiment station, for apparatus and chemicals	1,331 46	
For live stock and produce	191 61	
Experiment station, for station building	3,000 00	$39,213 13
EXPERIMENT STATION.		
United States treasurer	$18,750 00	
W. H. Jordan, director	72 68	18,822 68
		$58,035 81

DISBURSEMENTS.

For Natural History building	$13,431 74
" Salaries	12,686 33
" Interest on loans	302 00
" Water supply	300 00
" Insurance	1,007 75
" Expense of trustees	195 52
" Coal and freight	437 60

DISBURSEMENTS—Concluded.

For Expense in Coburn will case	$50 00	
" Bonds for investment	3,000 00	
" Apparatus	1,000 00	
" Library	600 00	
" Advertising	60 00	
" Repairs	500 00	
" Work shop and tools	330 00	
" Construction of station building	3,182 42	
" Gravel	75 00	
" Furniture	28 48	
" Stationery and postage	14 00	$37,200 84
EXPERIMENT STATION.		
For Field and feeding experiments	826 77	
" General expenses	291 83	
" Chemical laboratory	2,966 11	
" Construction account	3,000 00	
" Refunded to College for amount expended for station, from Oct. 1, 1887, to Dec. 31, 1887	932 78	
" Salaries	4,534 67	
" Library	1,626 05	
" Printing and stationery	492 58	
" Travelling expenses	194 20	
" Live stock	1,294 50	
" Gas machine	712 50	
" Furniture	400 00	
" Safe	190 00	
" Rents	22 50	
" Botany and Entomology department	8 79	
" Meteorology department	76 79	
" Sundry accounts	56 78	$17,626 85
Cash in treasury, December 4, 1888	-	3,208 12
		$58,035 81

CONDITION OF ENDOWMENT FUND.

	$	
Invested in State of Maine 6% bonds	118,300 00	
" City of Bangor 6% bonds	3,000 00	
* " Hallowell C. and S. Academy 6% bonds	4,000 00	
" Lombard Investment Co , 6% bonds	3,000 00	
" Security, Loan and Trust Co., Des Moines, Iowa, 6% bonds	3,000 00	$131,300 00

*Suspended payment of interest.

J. FRED WEBSTER, *Treasurer.*

ORONO, Dec. 18, 1888.

I have examined the Treasurer's accounts and find them properly vouched and correctly cast.

WM. H. STRICKLAND, *Auditor.*

SUMMARY OF

METEOROLOGICAL OBSERVATIONS.

TAKEN AT THE

MAINE STATE COLLEGE of AGRICULTURE and the MECHANIC ARTS,

Latitude, 44° 54′ 2″ N. Longitude, 68° 40′ 11″ W.

From January, 1869, to January, 1889.

BY PRESIDENT FERNALD.

Height of instruments above the level of the sea, 134 feet until June, 1879, and 129 feet since that date.

Explanations, Deductions and Remarks.

The hours of observation are the same as those formerly adopted by the Smithsonian Institution, viz: 7 A. M. and 2 P. M., and 9 P. M., local time.

The figures in the columns headed "Force or pressure of vapor," show the height at which a column of mercury is maintained by the weight of the moisture of the air.

The warmest day of the year 1888 was July 5th, when the mean temperature was 78°.5, and the coldest day was January 15th, when the mean temperature was 6°,9 below zero.

The highest temperature (93°.4) recorded during the year was on the 23d, of June, and the lowest temperature (19°.6 below zero) on the 25th, of January.

The range of temperature between the two extremes is 113°0 which is less by only 0°.1 than the average range between the extremes for the last twenty years.

The warmest day within the period covered by the tables was August 7th, 1876, when the mean temperature was 85°3, and the coldest day January 8th, 1878, when the mean temperature was 17°.2 below zero. The highest temperature (96°.7) occurred on August 6th, 1876, and the lowest temperature (35°.6 below zero) on January 8th, 1875.

A comparison, as regards temperature, of the several months of 1888, with the mean temperature of corresponding months for twenty years, is given below:

Months.	Mean temperature from 1869 to 1888 inclusive.	Mean Temperature for 1888.	
January	15°.02	8°.58	6°.44 colder.
February	18°.92	18°.96	0°.04 warmer.
March	26°.83	28°.03	1°.20 "
April	39°.78	37°.52	2°.26 colder.
May	52°.37	50°.35	2°.02 "
June	62°.39	62°.82	0°.43 warmer.
July	67° 56	65°.14	2°.42 colder
August	65°.56	63° 49	2°.07 "
September	57°.19	54°.86	2°.33 "
October	45°.96	42°.12	3°.84 "
November	33°.58	35°.43	1°.85 warmer.
December	21°.25	27°.90	6°.65 "

The year 1886 (mean temperature 41°.26) averaged 0°.94 colder than the mean temperature of the twenty years under notice.

The latest spring frost was on May 22d, and the earliest autumnal frost on the morning of September 6th, followed by destructive frosts on September 7th, 29th, and 30th.

The principal thunder storms of 1888 occurred on May 1st, June 6th, 23d and 30th, July 7th, 11th, 23d, 24th, 31st and August 17th, 25th and 26th.

The rainfall and melted snow of 1888 amounted to 58.04 inches, a quantity larger by 12 65 inches than the average for twenty years; the snowfall was 134.60 inches, a quantity greater by 37.75 inches than the average for the same period.

The number of days in 1888 on which the sky was at least eight-tenths covered with clouds was 114, or 31 per cent of the whole number. The number of days on which at least .01 of an inch of rain or snow fell was 162, or 44 per cent of the whole number; the number of days, therefore, without any considerable quantity of rain or snow, was 204, or 56 per cent of the whole number.

During the month of June the prevailing wind was S. W. and S.; during the other months of the year, N. W. and W. Heavy winds prevailed on January 15th, 20th, 21st and 26th, February 15th and 28th, March 12th, 13th and 17th, April 7th, July 11th, 24th, 31st, Aug. 2d, Sept 26th, 27th, Oct. 29th, Nov. 3d, 25th and Dec 12th and 28th

The prevailing wind for the twenty years, from 1869 to 1887, inclusive, was from the north-west and west. The relative direction and force of the wind for this period are indicated approximately by the following numbers: N. W. and W., 4; S. W. and S., 3; S. E. and E., 1; N. E. and N., 2.

The principal auroras of 1887 were on the evenings of January 8th, February 3d, March 17th and 18th, May 7th, 8th and 9th, June 3d, August 2d, Sept. 29th, October 10th, 11th and 30th, and Dec. 29th; that of Aug. 2d being especially brilliant. The principal lunar halos were on March 24th, April 19th, October 14th, and Dec 8th, and the principal solar halos, March 17th and May 4th.

The Zodiacal light was especially conspicuous on the evenings of January 13th and 31st, February 2d, 3d and 29th, and Dec 22d.

On January 4th, 6 45 P. M., Eastern standard time, a brilliant meteor starting near the zenith moved in a direction S. about 40° E to a point about 40° above the horizon when it vanished. It was apparently about one-fourth as large as the moon and although the sky in the region of its path was partially covered with thin clouds, it illuminated the horizon with a bright light of which there were three distinct flashes, caused doubtless by its shining out between successive clouds.

On December 28th, 4.40 P M , Eastern standard time, a like brilliant meteor was observed in the north-western sky.

The barometer indicated the greatest pressure in the month of January, and the least also in the same month. The range between the two extremes was 1.827 inches. The least mean pressure was during October and the greatest during November, when the average height of the mercury in the barometer at an elevation of 129 feet above the sea level was 29 966 inches.

The mean humidity of the air for the year was .79.

SUMMARY BY MONTHS—1888.

Months.	Thermometer in the Open Air.										Rain and Snow.		Cl'ds.	Winds.				Barometer.			Relative humidity or fraction of saturation.		
	Mean of warmest day.		Mean of coldest day.		Highest temperature.		Lowest temperature.		Mean of maximum temperatures.	Mean of minimum temperatures.	Mean of three daily observations.	Amount of rain and melted snow—inches.	Amount of snow—inches	Mean percentage of cloudiness	Per cent of direction and force.				Barometer height reduced to freezing point of water.					
	Day.	Temperature.	Day.	Temperature.	Day.	Temperature.	Day.	Temperature							N. W. and W.	S. W. and S.	S. E. and E.	N. E. and N.	Maximum.	Minimum.	Mean.	Maximum.	Minimum.	Mean.
		°		°		°		°	°	°	°													
January	15	32.0	28	- 6.9	2	47.4	25	-19.6	18.47	0.26	8.58	4.97	37.50	.41	.76	.06	.04	.16	30.686	28.859	29.896	100	42	86
February	26	37.7	10	- 2.7	14	43.6	1	-19.2	28.99	6.30	18.96	6.11	20.50	.46	.55	.12	.15	.18	30.389	29.312	29.922	100	40	81
March	21	41.8	1	15.9	22	48.3	2	2.1	35.15	19.81	28.01	6.48	26.00	.62	.64	.06	.12	.18	30.517	29.371	29.799	100	35	78
April	28	56.6	8	21.6	28	75.5	8	12.6	45.43	28.65	37.52	1 78	16.00	.50	.58	.11	.10	.21	30.373	29.414	29.933	100	33	69
May	31	61.3	1	35.0	31	75.2	4	25.4	59.72	40.23	50.35	2.82	-	59	.42	.17	.21	.20	30.156	29.641	29.892	100	29	72
June	23	76.7	3	54.3	23	93.4	2	44.0	72.59	51.91	62.82	3.65	-	.49	.28	.38	.18	.16	30.093	29.379	29.761	100	30	74
July	5	78.5	12	55.4	5	85.5	12	37.0	76.48	54.27	65.14	2.47	-	.50	.44	.21	.26	.09	30.198	29.105	29.800	98	40	75
August	5	72.1	23	54.5	5	83.4	23	45.2	72.65	54.32	63.49	4.59	-	.62	.61	.10	.16	.13	30.176	29.470	29.786	100	35	82
September	9	67.4	29	40.0	9	75.1	30	30.2	63.33	46.66	54.86	6.97	-	.59	38	.23	.10	.29	30.550	29.194	29.951	100	43	84
October	7	57.2	30	33.4	28	60.3	15	26.6	48.37	35.68	42.12	7.51	5.00	.69	.58	.11	.05	.26	30.376	29.034	29.754	100	44	83
November	6	56.2	22	12.0	1	64.7	23	3.2	42.32	27.76	35.43	5.73	10.00	.59	.39	.21	.08	.32	30.644	29.282	29.966	100	43	82
December	27	55.1	22	3.5	25	60.6	14	- 3.3	34.00	18.90	27.90	4.96	19.60	.65	.51	.21	.00	.22	30.355	29.053	29.766	100	39	81
Year	J'ly 5	78.5	Jan. 15	- 6.9	Jun 23	93.4	Jan. 25	-19.6	49.79	32.02	41.26	58.04	134.60	.56	.51	16	.13	20	30.686	28.859	29.851	100	29	79

SUMMARY BY YEARS—From 1869 to 1888, inclusive.

Year	Temperature in the Open Air.											Rain and Snow.		Clds.	Winds.			Barometer.								
	Mean of hottest day.		Mean of coldest day.		Highest temperature		Lowest temperature		Mean of maximum temperatures	Mean of minimum temperatures.	Mean of three daily observations.	Amount of rain or melted snow in gauge—inches.	Depth of snow—inches.	Mean percentage of cloudiness.	Per cent of direction.			Barometer height reduced to freezing point.			Force or pressure of vapor in inches.			Relative humidity or fraction of saturation.		
	Day.	Temperature.	Day.	Temperature.	Day	Temperature.	Day.	Temperature.							N. W. and W.	S. W. and S.	S. E. and E.	N. E. and N.	Maximum.	Minimum.	Mean.	Maximum.	Minimum.	Mean.	Maximum.	Minimum.	Mean.
1869,	July 11	74.2	Jan. 22	-3.8	July 11	87.2	Mar. 6	-22.0	50.01	33.37	41.77	44.72	84.92	.55	.41	.29	.14	.16	30.519	28.858	29.780	.826	.005	.250	100	25	76
1870,	July 24	82 8	Jan. 14	-9.7	July 24	94.0	Feb. 4	-17.0	53.02	35.45	44.26	40.98	78.75	.50	.35	33	10	.22	30.578	28.902	29.791	.878	.016	.279	100	13	74
1871,	May 30	76 0	Jan. 23	-14.9	May 30	88.6	Jan. 23	-20.6	50.44	33.33	41.92	41.63	80.50	.50	.42	.33	.10	.15	30 585	29.000	29.795	.956	.006	.244	100	17	75
1872,	July 16	79.5	Dec 25	-11.8	June 30	90.6	Dec 25	-23 0	50.02	33.22	41 60	48.54	113.00	.53	.37	.28	.13	.22	30.446	28.712	29.706	.793	.011	.258	100	23	77
1873,	July 30	75.5	Jan. 30	4.9	July 26	92.0	Jan. 30	-26.5	49.93	31.28	40.93	40.78	124.00	.49	.38	.30	.10	.22	30.680	28.423	29.794	.778	.009	.232	100	20	74
1874,	July 15	76.3	Jan. 26	15.5	July 15	86.3	Feb 2	-26.0	50.18	32.21	41 35	44.94	132.00	.52	.37	.36	.08	19	30.719	28 981	29.825	.794	.009	.240	100	19	76
1875,	Aug. 29	74 8	Nov 30	9.8	Aug. 29	87.8	Dec 20	-23.0	48.49	30 11	39.58	41 94	93 80	.50	.40	.30	.09	.15	30.550	28.939	29 814	.844	.014	.239	100	24	76
1876,	Aug. 7	85.3	Feb. 24	13.4	Aug 6	96.7	Dec 26	-21.5	50.74	32 32	42 03	52.37	123.00	.49	.43	.30	.08	.19	30.783	28.458	29.808	.935	.014	.250	100	21	76
1877,	Aug. 24	75 1	Jan 25	11.3	June 1	89 0	Jan 26	-32.5	52.45	33.63	43.39	40.17	66.50	.52	.34	.30	.12	24	30 494	28.888	29.837	.762	.009	.269	100	19	76
1878,	June 30	81.9	Jan. 8	17.2	June 30	93.5	Jan. 8	-35 6	52 07	35.38	44.34	48.57	59.50	.56	.33	.33	.13	.21	30.554	28 794	29.796	.872	.009	.280	100	20	78
1879,	July 16	77 8	Dec. 21	11.7	Aug 2	88.0	Dec 27	26 0	50.10	31.67	41.62	46.73	112.00	.51	.38	.37	.07	.18	30.638	28.537	29.851	.843	.012	.258	100	15	75
1880,	July 10	82.3	Feb. 2	-4.4	July 10	94.8	Jan. 14	-15.4	52 05	33.50	43.85	33.81	69.00	.50	.39	.23	.18	.20	30.644	29.090	29.874	.790	015	.269	100	23	75
1881,	Aug. 5	78.1	Feb. 2	9.1	Aug. 5	91.0	Jan. 2	-18.2	52.11	34 98	43 87	42 80	54 50	.54	.45	.18	.14	.23	30.647	28.919	29 862	.891	.019	.281	100	21	77
1882,	Aug. 6	80.7	Jan. 24	40 0	Aug. 5	92 0	Jan. 25	-22.4	50.76	33.10	42.54	41.26	110.00	.49	.46	.18	.12	.24	30.724	29.121	29.885	.819	.016	.261	100	24	75
1883,	July 6	75.1	Dec 23	-13.1	July 7	85.6	Jan. 6	-25.0	50.04	31.79	40.72	40.60	53 00	.48	.41	30	13	.16	30 641	28.750	29 904	.860	.015	.259	100	18	78
1884,	Aug. 18	77.2	Dec 20	10.4	Aug 18	86.0	Jan. 28	-29.0	51 57	33.23	42 85	44.95	90.00	.56	.35	.33	14	.18	30.716	28.768	29.875	-	-		100	16	81
1885,	July 25	76.4	Jan 22	11.5	July 25	89 2	Jan. 31	-22.3	50.54	32.30	41.37	52.99	108.00	.49	.41	.32	.11	.16	30.608	28.800	29.849	-	-		100	24	79
1886,	July 7	78.0	Jan 12	15 3	July 7	92.5	Jan. 12	-26 5	52.20	33.24	42.61	48.04	136.50	.53	.40	.35	.10	.15	30.731	28.556	29.889		-	-	100	10	78
1887,	July 2	82.5	Jan. 9	-13.8	July 2	93 3	Jan. 9	-29.0	51.05	32.90	42 07	52 88	115 25	.52	44	.31	09	.16	30 810	28 917	29.883	-	-	-	100	20	79
1888,	July 5	78.5	Jan. 15	-6.9	Jan. 23	93.4	Jan 25	-19.6	49.79	32 02	41 26	58 04	134.60	.56	.51	.16	.13	.20	30.686	28.859	29.851	-	-	-	100	29	79
	1876.		1878.		1876.		1878.					Mn.	Mean.														
20 yrs	Aug. 7	85.3	Jan. 8	-17.2	Aug. 6	96.7	Jan. 8	-35.6	50.88	33.51	42.21	45.39	96.85	.52	.41	.28	11	.20	30 810	28.423	29.838	-	-	-	100	10	76

APPENDIX.

CATALOGUE

OF THE

Maine State College of Agriculture and Mechanic Arts.

ORONO, MAINE, 1888–89.

TRUSTEES:

HON. LYNDON OAK, GARLAND, *President.*
WM. T. HAINES, B. S., LL. B., WATERVILLE, *Secretary.*
CAPT. CHARLES W. KEYES, FARMINGTON.
HON. FRED ATWOOD, WINTERPORT.
GEN. R. B. SHEPHERD, SKOWHEGAN.
ARTHUR L. MOORE, B. S., LIMERICK.
WM. H. STRICKLAND, ESQ., BANGOR.
RUTILLUS ALDEN, ESQ., WINTHROP.
HON. Z. A. GILBERT, EAST TURNER,
Secretary of Maine Board of Agriculture, *ex-officio.*

TREASURER:

J. FRED WEBSTER, ORONO.

EXECUTIVE COMMITTEE:

HON. LYNDON OAK.
WM. T. HAINES, ESQ.
WM. H. STRICKLAND, ESQ.

EXAMINING COMMITTEE:

HIS EXCELLENCY EDWIN C. BURLEIGH.
REV. CHARLES F. ALLEN, D. D.
WM. B. LAPHAM, M. D.

FACULTY.

MERRITT C. FERNALD, A. M., PH. D., PRESIDENT,
and Professor of Physics and Mental and Moral Science.

ALFRED B. AUBERT, B. S.,
Professor of Chemistry, and Secretary of the Faculty.

FRANCIS L. HARVEY, M. S.,
Professor of Natural History.

GEORGE H. HAMLIN, C. E.,
Professor of Civil Engineering, and Librarian.

ALLEN E. ROGERS, A. M.,
Professor of Modern Languages, Logic and Political Economy.

WALTER BALENTINE, M. S.,
Professor of Agriculture.

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

JAMES N. HART, B. C. E.,
Instructor in Mathematics and Drawing.

LIEUT. EVERARD E. HATCH, 18th U. S. INFANTRY,
Professor of Military Science and Tactics.

HOWARD S. WEBB, B. M. E.,
Instructor in Shop-Work, and Registrar.

AARON E. SPENCER,
Steward.

STUDENTS.

SENIOR CLASS.

Briggs, Fred Percy,	Hudson.
Cushman, Charles Granville,	North Bridgton.
Edgerly, Joseph Willard,	Princeton.
Ferguson, Jere Sweetser,	Searsport.
Freeman, George Gifford,	Cherryfield.
Gay, George Melville,	Damariscotta.
Haggett, Eben Raymond,	Newcastle.
Leavitt, Nellie Louise,	Norridgewock.
Reed, John,	Benton.
Reed, Nellie Waterhouse,	Stillwater.
Sargent, William Henry,	Brewer Village.
Stevens, Fred,	Gouldsboro'.
Vickery, Gilbert Scovil,	Bangor.
White, Ambrose Harding,	Bucksport.
White, Mark Elmer,	Ashland.
Wilson, Mortimer Frank,	Orono.

JUNIOR CLASS.

Andrews, Frank Orris,	Rockland.
Babb, George Herbert,	Sebago.
Bird, John, 2d,	Rockland.
Blackington, Ralph Harvey,	Rockland.
Bowden, George Irving,	So. Penobscot.
Cargill, Carroll David,	Livermore Falls.
Clark, Hugo,	Lincoln.
Coffin, Alphonso John,	Harrington.
Croxford, Walter Everett,	Jackson.
Dillingham, Charles Albert,	Old Town.
Dow, Fred Todd,	Gorham.
Drew, Albert Wilson,	Canaan.
Dunton, Harris Drummond,	Boothbay.
Farrington, Horace Parker,	Cape Elizabeth.
Gould, George Pendleton,	Stillwater.
Grover, Nathan Clifford,	West Bethel.
Hardison, Allie Crosby,	Caribou.
Harvey, Chandler Cushman,	Fort Fairfield.
Hastings, Allie Mills,	Rockland.
Hayes, Samuel Henry Tewksbury,	Oxford.
Heath, Everett Fenno,	Bangor.
Jones, Leon Houston,	Rockland.
Kelley, Edward Havener,	Belfast.
Kenniston, Irving Chase,	Boothbay.
Keyes, George Edwin,	Hampden.
Lewis, John Winchcombe,	Milton Mills, N.H.
Morey, Elmer Lake,	Colombo, Ceylon.
Morrill, Edmund Needham,	Deering.
Owen, John Wesley, Jr.,	Saco.
Peirce, Varna John,	Hudson.
Peirce, William Bridgham,	Hudson.
Pierce, William Barron,	Harpswell.
Pillsbury, George Melville,	North Scarboro'.
Quincy, Fred Grant,	Masardis.

Rackliffe, Joseph Riley,	Hampden.
Reed, Fullerton Paul,	Boothbay.
Sawyer, Frank Wade,	Milford.
Swan, Clarence Buzzell,	Old Town.
Wallace, Chester Jay,	Jackson.
Webb, Winfield Scott,	Caribou.
Webber, Gilman Hodgdon,	East Boothbay.
Wight, Ralph Holbrook,	Belfast.
Williams, Laforest Charles,	Athens.
Williams, Charles Sampson,	Monhegan Island.

SOPHOMORE CLASS.

Andrews, Arthur Wellington,	Biddeford.
Arey, Ralph Jesse,	Hampden.
Bailey, William Melvin,	Skowhegan.
Boadway, Leslie Albert,	Orono.
Butterfield, William Rowe,	Milford.
Clark, Edmund,	Bethel.
Clayton, Charles,	Bangor.
Cobb, Charles Edward,	Patten.
Davis, James Walker,	Yarmouthville.
Farrington, Wallace Rider,	Cape Elizabeth.
Farrington, William Rowe,	Portland.
Flanagan, John Henry,	Rockland.
Graves, Joseph Colburn,	Orono.
Hall, Bert Austin,	Shapleigh.
Hamlin, Cyrus,	Bangor.
Harlow, William Augustus,	Milford.
Hatch, Earnest Stearns,	Lovell Centre.
Hersey, Jacob Frye,	Patten.
Keith, William Everett,	Old Town.
Lord, Robert William,	Skowhegan.
Menges, Hugo Gustave,	Bangor.
Merrill, True Lander,	Orono.
Miller, Albert Morton,	Waldoboro'.
Morris, William Allen,	Bangor.
Moulton, Fred Charles,	Hiram.
Norton, Jay Pearl,	York Corner.
Otis, Arthur Monroe,	Grafton.
Page, Warren Robin,	Hampden.
Patten, William Nickels,	Cherryfield.
Pillsbury, Clifford Irving,	Rockland.
Scott, Clarence,	Olamon.
Starrett, Henry Vaill,	Warren.
Steward, John White,	Skowhegan.
Taylor, Charles Norton,	Hampden.
Thompson, George Edward,	Orono.
Tirrill, Leonard Alexander,	Holden.

FRESHMAN CLASS.

Atkinson, William Hacker,	Brunswick.
Bailey George Albert,	Dexter.
Bristol, Mortimer Leonard,	Canton Ctr., Conn.
Clifford, Edwin True,	Leeds.
Danforth, Ernest Wilbur,	Brunswick.
Farrington, Mellen Edward,	Brewer.
Fernald, Robert Heywood,	Orono,
Gibbs, Clinton John,	So. Turner.
Grover, Arthur Curtis,	West Bethel.
Healey, Warren Evans,	Rockland.
Kittredge, Charles Prentiss,	Milo.
Maguire, George Patrick,	Biddeford.
Maling, Charles Henry,	Brewer.
McKechnie, Willard Erastus,	Princeton.
Prentiss, Henry Mellen,	Brewer.
Prince, Job,	So. Turner.
Randlette, Charles Morris,	Richmond.
Rich, George Frank,	Bethel.
Thompson, Harry Stanley,	Dexter.
Tolman, Frank Stevens,	Milo.
Tyler, Joseph Albert,	Farmington.

SPECIAL STUDENTS.

Fernald, Henry Elmer,	So. Levant.
Greenwood, Elmer Ellsworth,	Moscow.
Hamilton, George Curtis,	Dexter.
Hodgdon, Edward Wyman,	Brewer.
Webster, Alden Palmer,	Orono.

SUMMARY.

Seniors,	16	Freshmen,	21
Juniors,	44	Special,	5
Sophomores,	36		
		Total,	122

PRIZES FOR 1888.

Prentiss Prize, for best Junior Essay, awarded to Fred Percy Briggs, of Hudson.

Prentiss Prize, Sophomore Declamation, awarded to George Herbert Babb, of Sebago.

Libbey Prize, for best Agricultural Essay, awarded to Fred Percy Briggs, of Hudson.

Award for highest standing, Sophomore Class, to Chandler Cushman Harvey, of Fort Fairfield.

Award for highest standing, Freshman Class, to Leslie Albert Boadway, of Orono.

MILITARY DEPARTMENT.

COBURN CADETS.

Second Lieutenant EVERARD E. HATCH, 18th U. S. Infantry, Commanding.

Cadet JOHN REED, Major and Commandant of Cadets.

Cadet JOSEPH W. EDGERLY, First Lieutenant and Adjutant.

Cadet FRED P. BRIGGS, First Lieutenant and Quartermaster.

Cadet EVERETT F. HEATH, Sergeant Major.

	Co. A.	Co. B.
Captain	C. G. Cushman	J. S. Ferguson.
1st Lieutenant	E. R. Haggett	G. S. Vickery.
2d "	G. G. Freeman	M. E. White.
2d "	G. M. Gay	Fred Stevens.
1st Sergeant	E. H. Kelley	F. T. Dow.
Sergeant	S. H. T. Hayes	G. H. Babb.
"	H. P. Farrington	N. C. Grover.
"	J. R. Rackliffe	A. W. Drew.
Corporal	W. A. Harlow	L. A. Boadway.
"	W. R. Farrington	H. V. Starrett.
"	W. N. Patten	W. F. Keith.
"	H. G. Menges	Robert Lord.

Armorer, W. E. Croxford

Band Leader, G. E. Keyes.

Band Sergeant, L. H. Jones.

COLOR GUARD.

Color Sergeant, John Bird, 2d.

" *Corporal*, W. A. Harlow.

" " L. A. Boadway.

" " W. R. Farrington.

DESIGN OF THE INSTITUTION.

It is the design of the Maine State College of Agriculture and the Mechanic Arts to give, at a moderate cost, the advantages of a thorough, liberal and practical education. It seeks to do this by means of approved methods of instruction, and especially by making prominent the system of practically applying in the drawing-room, in the laboratory, in the shop and in the field, the lessons of the class-room. It thus endeavors to make its courses of high practical value.

By the act of Congress granting public lands for the endowment and maintenance of such colleges, it is provided that the leading object of such an institution 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."

While the courses of study fully meet this requisition, and are especially adapted to prepare the student for agricultural and mechanical pursuits, it is designed that they shall be also sufficiently comprehensive, and of such a character, as to secure the discipline of mind and practical experience necessary for entering upon other callings or professions.

CONDITIONS OF ADMISSION.

Candidates for admission to the Freshman Class must be not less than fifteen years of age, and must pass a satisfactory examination in Arithmetic, Geography, English Grammar (especial attention should be given to Orthography, Punctuation and Capitals), History of the United States, Physical Geography, Book-Keeping, Algebra to Logarithms and Plane Geometry.

Although the knowledge of Latin is not required as a condition of admission, yet the study of this language is earnestly recommended to all who intend to enter this Institution.

Candidates for advanced standing must sustain a satisfactory examination in the preparatory branches, and in all the studies previously pursued by the class they propose to enter.

Satisfactory testimonials of good moral character and industrious habits will be rigidly exacted. They should be presented on the day of examination.

The Friday following the last Wednesday of June, and the day of the beginning of the first term in August, are the appointed times for the examination of candidates at the college.

Arrangements have been made by which applicants accommodated by the plan may pass examination for admission without incurring the expense of coming to Orono. The gentlemen named below have been appointed examiners of the sections of the State in which they severally reside.

C. P. Allen, B. S.,	Presque Isle.
H. M. Estabrook, M. S.,	Gorham.
E. S. Danforth, B. S., S. W. Gould, B. S.,	Skowhegan.
Henry K. White, A. M.,	Newcastle.
Rev. W. R. Cross,	Milltown, N. B.
A. C. Dresser, A. B.	Bethel.
I. C. Phillips, A. B.,	Wilton.
Hon. N. A. Luce,	Augusta.
W. R. Whittle, A. B.,	Ellsworth.
W. E. Sargent, A. M.,	Hebron.
Edwin P. Sampson, A. B.,	Saco.

Examiners will indicate to parties applying, the time and special place of examination. Arrangements have also been made with the Seminary at Bucksport and with the Academy at Hampden, by which students from these institutions may be admitted to the college on certificate of qualification from the respective Principals.

All candidates, wherever they may arrange to be examined, should make early application to the president of the college. Applications will be recorded and regarded in the order of their reception.

COURSES OF INSTRUCTION.

Five full courses are provided, viz: A course in Agriculture, in Civil Engineering, in Mechanical Engineering, in Chemistry, and in Science and Literature.

The studies of the several courses are essentially common for the first year, and are valuable not only in themselves, but also as furnishing a necessary basis for the more technical studies and the practical instruction of the succeeding years.

Physical Geography, required on admission, serves as a suitable introduction to Geology, which is taken up in each of the courses. Physiology serves as an introduction to Comparative Anatomy, and Algebra, Geometry and Trigonometry, taught in the first year, are needed preliminaries to the higher mathematics and the practical applications required in Surveying, Engineering proper and Astronomy. Botany, Chemistry and Physics are highly important branches, common to all the assigned courses, and hence taken by all the students who are candidates for degrees.

Rhetoric, French and English Literature form the early part of the line of studies which later includes German, Logic, History of Civilization, United States Constitution, Political Economy, and Mental and Moral Science, branches, several of which relate not more to literary culture than to social and civil relations, and to the proper preparation for the rights and duties of citizenship.

Composition and Declamation are regular exercises in all the courses throughout the four years. For the characteristic features of each course, reference is made to the explanatory statements following the several schemes of study.

SPECIAL COURSES.

Students may be received for less time than that required for a full course, and they may select from the studies of any class such branches as they are qualified to pursue successfully. Students in Special Courses are not entitled to degrees, but may receive certificates of proficiency.

DEGREES.

The full course in Civil Engineering entitles to the Degree of Bachelor of Civil Engineering; the full course in Mechanical Engineering, to the Degree of Bachelor of Mechanical Engineering; the full course in Agriculture, Chemistry, or Science and Literature, to the Degree of Bachelor of Science.

Three years after graduation, on presentation of a satisfactory thesis with the necessary drawings, and proof of professional work or study, the Bachelors of Civil Engineering may receive the Degree of Civil Engineer; the Bachelors of Mechanical Engineering, the Degree of Mechanical Engineer; the Bachelors of Science, the Degree of Master of Science.

COURSE IN AGRICULTURE.

FIRST YEAR.

First Term.	*Second Term.*
Physiology.	Botany.
Rhetoric.	French.
Solid Geometry.	Logarithms and Trigonometry.
P. M. Labor on Farm.	P. M. Labor on Farm.
Free-Hand Drawing.	Mechanical Drawing. (F. of T.)
Dissecting.	Botanical Laboratory Work. (L. of T.)

SECOND YEAR.

First Term.	*Second Term.*
Botany.	Qualitative Chemistry.
General Chemistry.	Physics. (F. of T.)
French.	German.
Physics.	Surveying. (L. of T.)
P. M. Laboratory Work in Botany.	English History (L. of T.) for ladies.
Laboratory Work in Physics.	P. M. Field Work and Forge Work.
	Laboratory Physics.
	French Translations for V.

THIRD YEAR.

First Term.	*Second Term.*
Agricultural Engineering, including Farm Implements, Farm Drainage and Mechanical Cultivation of the Soil.	Agricultural Chemistry, Landscape Gardening, Horticulture and Arboriculture and Farm Accounts.
Agricultural Chemistry or Advanced Chemistry, for V.	Zoology and Entomology.
English and American Literature.	Logic.
German.	P. M. Laboratory Work and Experimental Farming or *Analysis of English Authors, and German Translations.
P. M. Laboratory Work or *Analysis of English Authors and Translations from the French.	

FOURTH YEAR.

First Term.	*Second Term.*
Cattle Feeding and Dairy Farming.	Stock Breeding and Veterinary Science. Sheep Husbandry and Cultivation of Cereals.
Comparative Anatomy.	Mineralogy and Geology.
History of Civilization.	U. S. Constitution.
Political Economy.	Mental and Moral Science.
P. M. Experimental Farming and Agricultural Botany or *Translations from German.	P. M. Thesis and Laboratory Work and Theme and Thesis Work.

*To be taken in Course in Science and Literature in place of study preceding.

EXPLANATORY STATEMENTS.

This course is designed to fit young men to follow Agriculture as a profession with success, as well as to prepare them for the intelligent performance of the duties of citizenship.

To this end, the curriculum of studies is largely scientific and technical, not omitting, however, those branches that have been referred to as pertaining to social and civil relations.

The instruction in Agriculture is given largely by lectures, and embraces subjects of great practical importance to the farmer, which are briefly explained under the following heads:

Agricultural Engineering.—Combined with recitations in mechanics from a text-book, lectures are given on the principles of construction and use of farm implements, illustrated by charts to the extent possible, on the construction of roads, culverts and masonry, and on soil physics, or the relations of the soil to heat and moisture, the mechanical conditions of the soil best adapted to plant growth, and the objects to be gained by cultivation.

Agricultural Chemistry.—Under this head are considered the various methods of retaining and increasing the fertility of the soil, the sources, composition and methods of valuation of commercial and farm manures, together with the principles governing their treatment and application, the composition of cattle foods, their changes and uses in the animal system, and the value and economic use of the various kinds of fodders.

Landscape Gardening.—The object of this study is to furnish correct ideas of the manner of laying out and beautifying grounds. This subject is followed by lectures on Horticulture and Arboriculture.

Cultivation of Cereals.—Lectures are given upon the best methods of cultivating the principal farm crops.

Dairy Farming.—This embraces the chemical and physical properties of milk, and the principles and practical operations that underlie its production and manufacture into butter and cheese.

Sheep Husbandry.—The characteristics and comparative merits of our different breeds of sheep are discussed, also their adaptability to different conditions and uses.

Botany.—Following recitations and practical work in Botany, lectures are given upon fungi injurious to the farmer.

Chemistry.—One term is devoted to General Chemistry, two terms to Agricultural Chemistry, one-half term to Organic Chemistry, and

the afternoons of several terms are devoted to laboratory practice, including analysis of farm products.

Zoology and Entomology—In Zoology the larger groups of the animal kingdom are taken up and described in lectures which are illustrated by means of diagrams, models, or the objects themselves, and the students are required to make critical studies of typical animals of each group. Such laboratory practice is regarded an indispensable training for the more advanced study of the higher animals, and also forms the basis of the study of Historical Geology.

The studies in Entomology are conducted in a similar manner. After a general review of the orders has been given, illustrated by such common insects as are familiar to all, the beneficial and injurious are taken up more in detail, their round of life described, together with the injuries they do to the products of the farmer, the gardener and the fruit raiser, as well as to our forests and building materials, and the best known means of keeping them in check. For the purpose of making the instruction as practical and impressive as may be, many of the injurious insects are carried through their transformations in the class-room, where each student can note the various changes from day to day, and learn to recognize these insect enemies in any stage of their existence; and each member of the class is required to devote some time in field-collecting, and in observing the habits and work of insects in nature.

The subject of bee-keeping is taken up quite at length; the different kinds of bees in a swarm, their habits, anatomy, and the mode of collecting the different products are all described and illustrated by means of elaborate models, while artificial swarming, the mode of hybridizing a swarm, and the advantages of the same, with the most approved methods now in use for the care and management of bees, are also fully described.

Comparative Anatomy—Under comparative anatomy are taken up the anatomy and physiology of our domestic animals, together with a brief outline of our wild animals, so far as time permits. This is followed by instruction in stock breeding and veterinary science.

Mineralogy and Geology—A preliminary course of lectures is given on mineralogy, followed by laboratory practice in the determination of minerals, and in lithology, special attention being called to gypsum, limestone, and such other minerals as are of direct importance to the students of agriculture.

The instruction in Geology is by means of illustrated lectures and excursions, critical attention being given to the origin and formation of soils.

Law—A course of lectures is given to the Senior Class on International and Rural Law.

Throughout the course, the endeavor is made to inculcate established principles in agricultural science, and to illustrate and enforce them to the full extent admitted by the appliances of the laboratory and the farm. So far as possible, students are associated with whatever experimental work is carried on, that they may be better fitted to continue such work in after life.

Those who complete this course receive instruction also in Mathematics, French, German, English Literature, Logic, United States Constitution, Political Economy, and Mental and Moral Philosophy, and on presenting satisfactory theses upon some agricultural topic, are entitled to the degree of Bachelor of Science.

The Course in Science and Literature includes French and German, the general, mathematical, and most of the scientific studies of the agricultural course. Instead of certain branches quite purely technical in the latter course, History, and English and American Literature are substituted.

In the special laws of the State passed in 1872, it is provided that young ladies "who possess suitable qualifications for admission to the several classes may be admitted as students in the college."

In arranging the course in Science and Literature, reference has been had to this enactment. From this course, however, young men who desire it are not excluded, as on the other hand, young ladies are not excluded from any of the other courses.

COURSE IN CIVIL ENGINEERING.

FIRST YEAR.

First Term.	*Second Term.*
Solid Geometry.	Logarithms and Trigonometry.
Rhetoric.	Botany.
Physiology.	French.
P. M. Free-Hand Drawing.	Mechanical Drawing. (F. of T.)
Dissecting.	P. M. Botanical Laboratory Work. (L. of T.)
Labor on Farm.	Labor on Farm.

SECOND YEAR.

First Term.	*Second Term.*
Descriptive Geometry.	Analytical Geometry.
General Chemistry.	German.
French.	Physics. (F. of T.)
Physics.	Surveying. (L. of T.)
P. M. Mechanical Drawing.	Qualitative Chemistry.
Laboratory Work in Chemistry.	P. M. Field Work.

THIRD YEAR.

First Term.	*Second Term.*
Calculus.	Calculus. (F. of T.)
Henck's Field Book and R. R. Surveying.	Descriptive Astronomy. (L. of T.)
German.	Mechanics. (F. of T.)
P. M. Field Work and Drawing.	Graphic Statics. (L. of T.)
	Logic.
	P. M. Isometric and Cabinet Projection and Perspective.

FOURTH YEAR.

First Term.	*Second Term.*
Civil Engineering.	Civil Engineering, Designs and Specifications.
Stereotomy. (F. of T.)	
Sanitary Engineering. (L. of T.)	Mineralogy and Geology.
Practical Astronomy.	U. S. Constitution.
Political Economy.	P. M. Designing and Thesis Work.
P. M. Higher Surveying.	

EXPLANATORY STATEMENTS.

The object of this course is to give the student a thorough knowledge of Higher Mathematics, Mechanics, Astronomy and Drawing, and, at the same time, a thorough drill in the use and care of the ordinary engineering instruments and in the application of the mathematical principles and rules, so that the graduates can at once be made useful in engineering work and be fitted, after a limited amount of experience in the field, to fill positions of importance and trust. The course is also arranged so as to afford, so far as can be, the education required to prepare the graduate for a responsible position among *men*, as well as among engineers.

In this course the work is identical with that of the other courses during the first year. During the fall term of the Sophomore year, students in this course work two hours each afternoon, in the drawing room, on free-hand and mechanical drawing. In the last term of this year, the subject of land surveying is taken up. The first eight weeks are devoted to tinting, shading, etc., in water colors, while the remaining twelve weeks are given to practical surveying. Besides an hour's recitation each day, the class is engaged two hours, either in the field or drawing room, becoming familiar with the use and care of instruments, putting into practice the problems found in the text-book, and making actual surveys.

In the first term of the Junior year, Henck's Field Book is used as a text-book, from which the student obtains methods of running railroad curves, putting in switches and turnouts, setting slope-stakes, and the calculation of earthwork. This is supplemented with examples worked by the student, and lectures on levelling, preliminary and final surveys, and on the resistance to trains offered by grades and curves, together with the theory and construction of country roads, streets and pavements. These methods of the text-book, so far as possible, are applied in the field by the execution of the preliminary and final surveys of a railroad from the college buildings to some point on the Maine Central R. R., together with the necessary drawings, calculation of earthwork and estimate of the cost of building and equipping the same.

The subject of Applied Mechanics is taken up the last term of this year, in which the students receive a thorough training in the principles underlying construction, illustrated as far as possible by practical examples, in which these principles are applied. During

this term, each student in the class works two hours each day in the drawing room, where isometric, cabinet and perspective projection are taught by means of lectures and problems drawn by the students.

During the first term of the Senior year an extended topographical survey, with the plane table and stadia measurements, is made, based upon a previous trigonometrical determination of the principal points. During this term the students are also taught the use of the current meter and apply their knowledge in the actual measurement of the volume of the Stillwater river.

In the recitation room during this term the principles of the strength of materials are taken up, supplemented by information as to durability, preservation and fitness for special purposes. The theories of ties, struts, beams, foundations, retaining walls and arches, are fully treated.

Stone cutting is taken up this term, by lectures and practical problems, each student being required to make a complete set of working drawings of the most common forms of masonry arches.

Six weeks of this term are devoted to sanitary engineering; especial attention being given to ventilation, heating, purity of water supply and the proper drainage of houses and towns.

The first part of the last term of this year is devoted to the theory of roof and bridge trusses, the principles of hydraulics as applied in engineering practice, lectures on the locomotive engine, while the greater part is given to the application of the principles already learned, to the designing and calculation of various kinds of engineering structures, and to making out estimates and specifications.

This, together with the preparation of a satisfactory thesis, completes the work in the course of Civil Engineering.

MINERALOGY AND GEOLOGY.

Mineralogy is taught by an introductory course of lectures, followed by laboratory practice in the determination of minerals and rocks, especial attention being given to their value for building purposes. This is immediately followed by a course of lectures in Geology, together with excursions for the pupose of studying the rocks *in situ*, and also superficial deposits. Critical examinations are made in various railroad cuts of the hardness, slaty structure, jointed structure, etc., as bearing upon the cost of excavation.

ASTRONOMY.

In the last part of the spring term, Descriptive Astronomy is taken by the students of the Junior Class, and Practical Astronomy in the first term, Senior year.

The course in Astronomy is designed to enable students to determine with accuracy geographical positions. The principal instruments employed are chronometer, sextant, transit, and for work of precision, the Repsold vertical circle, an instrument made in Hamburg, Germany, in 1874. for this Institution. Practical instruction is given in the use of these instruments, and in the most approved methods of reducing observations for the determination of lattitude and longitude.

DEGREES.

Students in this department secure the degree of Bachelor of Civil Engineering on graduating, with the full degree of Civil Engineer three years after, on presentation of a satisfactory thesis, with proof of professional work or study.

COURSE IN MECHANICAL ENGINEERING.

FIRST YEAR.

First Term.

Solid Geometry.
Physiology.
Rhetoric.
Free Hand Drawing.
Dissecting.
P. M. Labor on Farm.

Second Term.

Logarithms and Trigonometry.
Botany.
French.
Mechanical Drawing. (F. of T.)
Botanical Lab'y Work. (L. of T.)
P. M. Labor on Farm.

SECOND YEAR.

First Term.

Descriptive Geometry.
French.
Physics.
General Chemistry.
P. M. Carpentry.
Lab'y Work in Chemistry.

Second Term.

Analytical Geometry.
Drawing and Kinematics.
Physics.
Surveying.
Qualitative Chemistry.
P. M. Mechanical Drawing and Forge Work.

THIRD YEAR.

First Term.

Calculus.
Kinematics.
Vise Work.
P. M. Machine Drawing.

Second Term.

Calculus. (F. of T.)
Descriptive Astronomy. (L. of T.)
Mechanics and Machine Design.
Logic.
Elements of Mechanism.
Link and Valve Motions.
P. M. Isometric and Cabinet Projection and Machine Drawing.

FOURTH YEAR.

First Term.

Steam Engineering.
Practical Astronomy.
Political Economy.
P. M. Machine Drawing and Designing.

Second Term.

Steam Engineering.
Wood Turning.
Hydraulic Engineering.
Mineralogy and Geology.
U. S. Constitution.
P. M. Machine Drawing, Designing and Thesis Work.

EXPLANATORY STATEMENTS.

It is the design of this course to give such a knowledge of Mathematics, Mechanics, Principles of Mechanism, Drawing and Manual Art as shall enable the student successfully to enter practical life as an engineer, with the same thorough education in subjects required to fit him for the general duties of life as is afforded by the other courses.

The first two years' work is identical with that of the students in Civil Engineering, except that carpentry and forge work are taken the second year in place of part of the drawing. In the Junior year, the first term is devoted to the geometry of machinery, showing the students how different motions may be obtained independently of the power required. Special attention is here given to the subject of gearing, and a full set of problems worked out, illustrating cases commonly occurring in practice. In the second term of this year the subject of the geometry of machinery is continued by lectures on other methods of transmitting motion, as by belts, cams, couplings, and links. Considerable time is given to the study and designing of the various valve and link motions used on the steam engine. During the same term instruction is given in mechanics and the laws of the strength of materials, the student being required to design machine details in accordance with those laws.

The first part of the first term, Senior year, is employed in studying the laws of the expansion of steam, and their influence upon the construction of steam engines and boilers, the subject being illustrated by experiments on the shop engine, with the aid of an indicator. During the remainder of the term, the students are engaged in designing engines and other machines, and in making detail drawings of the same, such as would be required to work from in the shop.

During the last term, Senior year, the study of steam engineering is continued in its application to compound engines, and the subject of hydraulic engineering is taken up briefly, by lectures on the the storage of water for power and the theory and construction of modern water wheels.

TEXT-BOOKS AND BOOKS OF REFERENCE.

Weisbach,	Mechanics of Engineering.	Smith,	Steam Engine.
Goodeve,	Elements of Mechanism.	Smith,	Steam Boilers.
MacCord,	Kinematics.	Trowbridge,	Steam Boilers.
MacCord,	Slide Valve.	Zeuner,	Valve and Link Motions.
Van Buren,	Strength of Machinery.	Auchincloss,	Valve and Link Motions.
Knight,	Mechanical Dictionary.	Clark,	Manual.

SHOP WORK.

There are now three shops equipped according to the Russian system, and work in these is required of all students in this course. The first term of the Sophomore year, two hours of each day are devoted to work in carpentry, special attention being given to accuracy of workmanship.

During the second term of the same year, the student receives instruction in forge work, including the welding and tempering of steel. A course in vise work during the first term of the Junior year gives the student practice in the various methods of shaping and fitting metals by the use of the chisel, hack-saw and file. During their second term, the Junior students in this course take turns in running the shop engine, and are taught the rules of safety and economy in this branch of Engineering. Instruction in wood-turning is given during the last term of the Senior year.

DRAWING.

The work in drawing commences with a course in Free-Hand and Elementary Mechanical Drawing, extending through the Sophomore year.

The first term of the Junior year, the student spends the time allotted to drawing in working out practical problems on the construction of gear teeth, cams, etc., and in elementary practice in line-shading and tinting.

The second term of this year is devoted to isometric projection, and the making of finished drawings in ink and in water colors. In the first term of the Senior year, the student prepares an original design of some machine, makes working drawings of its details on tracing cloth, and finally prepares copies by the blue-print process. The afternoon work of the spring term consists of making calcula-

tions for designs of engines and boilers, the construction of the necessary working drawings, and making thesis drawings.

The remarks under Course in Civil Engineering, with regard to Astronomy, Mineralogy and Geology, apply also to this course, and to them reference is made.

Theses are required of all students as a condition of graduation, and must be on some subject directly connected with Mechanical Engineering.

Students in this course receive the degree of Bachelor of Mechanical Engineering upon graduation, with full degree of Mechanical Engineer three years afterwards upon presentation of a satisfactory thesis and proof of professional work or study.

COURSE IN CHEMISTRY.

FIRST YEAR.

First Term.	*Second Term.*
Physiology.	Botany.
Rhetoric,	French.
Solid Geometry.	Logarithms and Trigonometry.
P. M. Labor on Farm.	P. M. Labor on Farm.
Free Hand Drawing.	Mechanical Drawing. (F. of T.)
Dissecting.	Botanical Lab'y Work. (L. of T.)

SECOND YEAR.

First Term.	*Second Term.*
General Chemistry.	Qualitative Chemistry.
Botany.	Physics.
French.	German.
Physics.	Surveying.
P. M. Lab'y Work in Botany, Physics, Chemistry.	P. M. Field Work. Laboratory Physics.

THIRD YEAR.

First Term.	*Second Term.*
Chemistry.	Chemistry.
German.	Zoology and Entomology.
English and American Literature.	Logic.
P. M. Laboratory Work.	P. M. Laboratory Work.

FOURTH YEAR.

First Term.	*Second Term.*
Chemistry.	Chemical Laboratory Work.
Comparative Anatomy.	Mineralogy and Geology.
History of Civilization.	U. S. Constitution.
Political Economy.	P. M. Laboratory Work.
P. M. Laboratory Work.	

EXPLANATORY STATEMENTS.

This course aims to supply a want felt by students who wish to enter certain industries in which a somewhat extensive knowledge of Chemistry is important. The first two years are mainly like those of the other courses, Qualitative Analysis being, however, obligatory for these students in the second term of the Sophomore year.

During the Junior year, daily recitations are held in advanced Inorganic Chemistry. In the Senior year, advanced Organic Chemistry is taken up. Sophomores have one exercise a week in Elementary Chemical experiments. The afternoons are devoted to Quantitative Chemical Analysis by the Junior and Senior students of the course. The work consists of the most useful gravimetric and volumetric methods, beginning with the simple estimations, which are followed by more complex analyses of alloys, minerals, fertilizers, farm products, &c. A short course in the assay of gold and silver is also given.

The class-room text-books used by this department are: Remsen's Chemistry and Naquet's Principes de Chimie. In the Laboratory are used: Craft's Qualitative Chemical Analysis, Fresenius' Quantitative Chemical Analysis, Frankland's Agricultural Chemical Analysis, Flint's Examination of Urine, Rickett's Notes on Assaying, Appleton's Quantitative Analysis, and Classen's Quantitative Analysis.

Valuable books of reference are found in the library.

Students taking qualitative analysis must furnish a deposit of at least five dollars when they begin; those taking quantitative analysis are required to deposit at least seven dollars. Students taking the Course in Chemistry or an extended course in quantitative analysis are expected to provide themselves with a small platinum crucible.

The students, after passing all the required examinations and presenting satisfactory theses upon some chemical subject, graduate with the degree of Bachelor of Science.

Post graduate and special students can make arrangements with the Professor of Chemistry for an advanced or special course of laboratory work and recitations.

TABLE OF HOURS—First Term.

	Seniors.	Juniors.	Sophomores.	Freshmen.
7.30 A. M.	Chapel Services.	Chapel Services.	Chapel Services.	Chapel Services.
7.45 A. M.	History of Civilization, I, IV, V. Civil Engineering, II.	German, I, II, IV, V. Kinematics, III.	General Chemistry.	Geometry.
8.40 A. M.	Stock Feeding and Dairy Farming. I. Advanced Chemistry, IV. Practical Astronomy, II, III, V.	English and American Literature, I, IV, V. Calculus, II, III.	Botany, I, IV, V. Descriptive Geometry, II, III.	
9.35 A.M.	Stereotomy (F. of T.), II. Sanitary Engineering (L. of T.), II. Comparative Anatomy, I, IV, V. Steam Engineering, III.	Agricultural Engineering, I. Vise Work, III. Advanced Chemistry, IV.	French.	Rhetoric.
10.30 A.M.	Political Economy.	Agricultural Chemistry, I. Field Book, Road and Railroad Surveying, II. Vise Work, III.	Physics.	Physiology.
P. M.	Laboratory and Farm Practice, I. Higher Surveying, II. Designing and Drawing, III. Laboratory Work, IV. German Translations, V. Military Exercises.	Laboratory Work, I, IV. Field Work, II. Machine Drawing, III. Analysis of English Authors and French Translations, V. Military Exercises.	Laboratory Work in Chemistry. Laboratory Work in Botany, I, IV, V. Laboratory Work in Physics, I, IV, V. Mechanical Drawing, II. Carpentry, III. Military Exercises.	Labor on Farm. Free-Hand Drawing. Dissecting, two hours per week. Military Exercises.

Note.—Roman numerals refer to courses as follows: I, Agriculture; II, Civil Eng.; III, Mech Eng.; IV, Chemistry; V, Science and Lit.

TABLE OF HOURS—SECOND TERM.

	SENIORS.	JUNIORS.	SOPHOMORES.	FRESHMEN.
7.30 A. M.	Chapel Services.	Chapel Services.	Chapel Services.	Chapel Services.
7.45 A. M.	Mineralogy. Geology.	Agricultural Chemistry, etc., I. Calculus (F. of T.), II, III. Advanced Chemistry, IV. Descriptive Astronomy. (L. of T.)	German, I, II, IV, V. Drawing and Kinematics, III.	
8.40 A. M.	Mental and Moral Science, I, V. Civil Engineering (F. of T.), II. Contracts, Specifications, etc., II. Wood Turning, III. Laboratory Work, IV.	Logic.	Qualitative Analysis. Analytical Geometry, II, III.	Botany.
9.35 A.M.	Stock Breeding and Veterinary Science and Cultivation of Cereals, I. Steam Engineering & Hydraulics, III. Laboratory work, IV.	Zoology and Entomology, I, IV, V. Applied Mechanics (F of T.), II. Graphic Statics (L of T.), II. Elements of Mechanism (F. of T.), III. Link and Valve Motion (L. of T.), III.	Qualitative Analysis.	French.
10.30 A.M.	U. S. Constitution.	Zoology and Entomology, I, IV, V. Mechanics and Machine Design, III.	Physics. (F. of T.) Surveying, (L. of T.) English History (L. of T.), for ladies.	Logarithms and Trigonometry.
P. M.	Thesis and Laboratory Work, I. Designing and Thesis Work, II. Machine Drawing and Thesis Work, III. Laboratory Work, IV. Theme and Thesis Work, V. Military Exercises.	Laboratory and Garden Practice, I. Isometric and Cabinet Projection, and Perspective, II. Drawing, III. Laboratory Work, I, IV. German Translations, V. Military Exercises.	Forge Work, I, III. Field Work, I, II, IV, V. Laboratory Physics. French Translations, V. Military Exercises.	Labor on Farm. Mechanical Drawing. (F. of T.) Laboratory Work in Botany. (L. of T.) Military Exercises.

LABOR.

It is a characteristic feature of the college, that it makes provision for labor, thus combining practice with theory, manual labor with scientific culture.

The maximum time of required labor is three hours a day for five days in the week.

The larger part of the labor is educational, and for such labor no compensation in money is made. Students in the lowest class perform non-educational labor when required by the college and receive compensation, according to their industry, faithfulness and efficiency. The maximum price paid is ten cents an hour. In arranging for compensated labor, it should be understood that the college does not engage to furnish opportunities for such labor continuously, but rather as the farm and other interests require.

The students of the three upper classes carry on their principal labor in the laboratory, the drawing rooms, the workshops, or in the field, and for such labor they receive no pecuniary consideration, since it is of a purely educational character.

MILITARY INSTRUCTION.

Thorough instruction in Military Science is given by an officer detailed by the Secretary of War from the active list, United States Army, and is continued throughout the entire course. All able-bodied male students receive instruction in the school of the soldier, company and battalion drill. Arms and equipments are furnished by the United States Government. The uniform, furnished by students, is a dark blue blouse similar to the regulation blouse of an army officer, but with State of Maine buttons and gilt braid on cuff, and for officers, with chevrons and shoulder straps of red and gold; the pants of lighter blue with gilt braid on outside seams; the cap blue with gold wreath ornament. The uniform is required to be worn during military exercises, and it is recommended that it be worn at recitations and at other class and general college exercises.

LOCATION.

The college has a pleasant and healthful location, between the villages of Orono and Stillwater, about a mile from each. Stillwater

river, a tributary of the Penobscot, flows in front of the buildings, forming the western boundary of the college farm, and adding much to the beauty of the surrounding scenery.

The Maine Central Railroad, over which trains pass many times each day, has a station at the village of Orono. The college is within nine miles of the city of Bangor, and is consequently easily accessible from all parts of the State.

FARM AND BUILDINGS.

The college farm contains three hundred and seventy acres of land, of high natural productiveness, and of great diversity of soil, and is therefore well adapted to the experimental purposes of the Institution.

Wingate Hall, the building first erected, affords excellent accommodations for a limited number of students. The lower rooms of this building are appropriated to general and class purposes.

Oak Hall contains forty-eight rooms, and has connected with it a boarding-house for students. With these buildings, the Institution furnishes desirable accommodations for one hundred and twenty-five students.

The Laboratory contains two apparatus rooms, a lecture room, a weighing room, a recitation room, and rooms for analytical and other purposes, and is in all respects admirably adapted to the wants of the chemical department.

The Shop, built during the summer of 1883, is equipped for instruction in three departments of mechanical work, viz: filing, forging and working in wood.

Coburn Hall is occupied by the departments of Natural History and Agriculture. In addition to the rooms needful for the two departments named, it contains a large audience-room, a commodious room for the College Library, and a room especially arranged for a Physical Laboratory.

APPARATUS.

The College is furnished with valuable apparatus for the departments of Agriculture, Chemistry, Physics, Civil Engineering and Mechanical Engineering, to which additions are made as the exigencies of the several departments require. Models have been

made by instructors and students and others have been purchased that serve for purposes of instruction.

LIBRARY.

The library contains five thousand volumes, a large part of which has been obtained through the generosity of the late Ex-Governor Coburn. Valuable additions have also been made to it by other friends of the college, only a small number of the volumes having been purchased with money appropriated by the State. It is earnestly hoped that so important an auxiliary in the education of the student will not be disregarded by the people of the State, and that liberal contributions will be made to the library, not only of agricultural and scientific works, but also of those profitable to the general reader.

The following periodicals are supplied by the college to the library; American Journal of Science and Art, Popular Science Monthly, National Live Stock Journal, American Agriculturist, Journal Royal Agricultural Society (England), Journal Franklin Institute, American Engineering Magazine and Railroad Journal, Century Magazine, Atlantic Monthly, Harper's Monthly Magazine, North American Review, Education, American Machinist, Science, American Naturalist, Botanical Gazette, Mechanical Engineer, Journal of Comparative Medicine and Surgery, Agricultural Science.

READING ROOM.

The reading room is supplied with a number of valuable newspapers and periodicals. Grateful acknowledgment is herewith made for the following papers, generously sent by the proprietors to the college:

American Cultivator, American Sentinel, Aroostook Republican, Gospel Banner, Eastern Farmer, Kennebec Journal, Lewiston Journal, Maine Farmer, Maine Industrial Journal, New England Farmer, Oxford Democrat, Piscataquis Observer, Portland Transcript, Somerset Reporter, Daily Whig and Courier, Zion's Herald, Official Gazette U. S. Patent Office, Bangor Daily Commercial, Farmington Chronicle, Phillips Phonograph, Springvale Advocate, Mount Desert Herald, Maryland Farmer, Dexter Gazette, Eastport Sentinel, Bee Journal, American Garden, Mirror and Farmer, Temperance Record, The Industrialist (Kansas).

The following papers are furnished by subscription, principally by the students:

American Machinist, Cultivator and Country Gentleman, Colby Echo, Bowdoin Orient, Scientific American, Scientific American Supplement, Eastern Argus (furnished by S. W. Gould), Lewiston Evening Journal, Journal of Education, Sanitary Engineer, Popular Science News, Washington Post, Boston Herald, Family Herald and Weekly Star (Montreal), Portland Express, Boston Record, Boston Globe (furnished by A. M. Miller).

CABINET.

The natural history collections of the college include about nine hundred named and mounted species of the flowering plants of Maine; a collection of sections of tropical species of wood presented by the Department of Agriculture at Washington, and a similar collection of the United States species from the Census Bureau.

The college also has a working collection of carefully selected forms representing the prominent groups of the animal kingdom; a large and valuable collection of Maine insects, carefully mounted and authentically named, and a fine collection of marine animals in alcohol, mostly from the coast of Maine, donated to the college by the United States Fish Commissioner. The above collections, together with charts, diagrams, skeletons, models, microscopes and other apparatus for illustrating the studies in natural history, are on exhibition in Coburn Hall.

On exhibition also are a good series of the more common minerals and ores supplemented by a collection presented by the National Museum; a collection of building stones from many of the Maine quarries, and a collection presented by the Smithsonian Institution, together with a series of microscopical sections of building stones, given by G. P Merrill, M. S. In the same room is exhibited a series of typical fossils which illustrate the various geological horizons, together with a collection of Indian stone implements, and various curiosities presented by the friends of the Institution.

PUBLIC WORSHIP.

All students are required to attend daily prayers at the college, and public worship on the Sabbath at some one of the neighboring churches, unless excused by the President.

YOUNG MEN'S CHRISTIAN ASSOCIATION.

The students of the college maintain an active organization of the Young Men's Christian Association, holding meetings weekly.

Its elevating influence in the college is clearly manifest, especially in the earnest and high moral and Christian life of those who constitute its membership.

EXPENSES.

Tuition is thirty dollars a year, divided equally between the two terms. The cost of material and repair of tools for the course of instruction in the vise shop is ten dollars; in the forge shop, nine dollars; in the wood shop, four dollars.

Laboratory expenses are at cost of glass ware broken, injury to apparatus, and chemicals used. A deposit of five dollars is required of students entering upon a term's work in Qualitative Analysis, and of seven dollars per term from students in Quantitative Analysis. Room rent is four dollars for the first term and five dollars for the second term of the college year.

Students residing too far from the college to *live* at home are required to room and board at the college, unless special permission to live elsewhere be granted by the President. Students receiving such permission pay room rent and fuel rent as though residing at the college.

Bedding and furniture must be supplied by the students, who also furnish their own lights. Tables, chairs, bedsteads, sinks and husk mattresses can be purchased at the college at moderate rates.

The price of board is two dollars and sixty cents per week; washing averages not more than sixty cents per dozen.

The warming by steam of single rooms (each suitable for two occupants) has averaged for the past six years about eleven dollars a room for each term. The expense of heating recitation rooms and rooms for general purposes has been about two dollars a term for each student, and the incidental expenses, including pay for the services of janitor, pay for bringing mail, for cleaning and renovating rooms, for general repairs, &c., have been about three dollars per term for each student.

From the items given, with an allowance of a few dollars a year for necessary text-books, quite an accurate estimate of needful expenses can be made.

The college term bills are payable, one-half at the commencement, and the remainder at or before the close of each term.

As security for the payment of college bills, a bond of one hundred and fifty dollars with satisfactory securities is required. A blank form of bond will be given with the ticket of admission.

MEANS OF DEFRAYING EXPENSES.

The terms are so arranged that the long vacation occurs in the winter, that students may have an opportunity to teach during that time. The summer vacation is in the haying season, when farm labor is most profitable. By availing themselves of the opportunities thus afforded, together with the allowance for labor on the college farm, industrious and economical students can cancel the greater part of their college expenses.

SCHOLARSHIPS.

The trustees make provision for the establishment of free scholarships by the following action:

Voted, That any individual or society paying to the Treasurer a sum not less than seven hundred and fifty dollars, shall be entitled to one perpetual free scholarship in the college.

OFFICERS OF THE ALUMNI ASSOCIATION.

PRESIDENT.

PROF. G. H. HAMLIN, Orono.

RECORDING SECRETARY.

PROF. WALTER FLINT, Orono.

CORRESPONDING SECRETARY.

CHAS. S. BICKFORD, Belfast.

TREASURER.

PROF. W. H. JORDAN, Orono.

NECROLOGIST.

E. M. BLANDING, Bangor.

CLASS SECRETARIES.

1872. E. J. HASKELL, Saccarappa.
1873. J. M. OAK, Bangor.
1874. W. BALENTINE, Orono.
1875. E. F. HITCHINGS, Warren, Mass.
1876. N. P. HASKELL, Orono.
1877. S. W. GOULD, Skowhegan.
1878. E. C. WALKER, Lovell.
1879. F. E. KIDDER, Denver, Colo.
1880. A. H. BROWN, Oldtown.
1881. A. T. INGALLS, So. Bridgton.
1882. C. S. BICKFORD. Belfast
1883. C. E. PUTNAM, Boston, Mass.
1884. G. H. ALLAN, Portland.
1885. H. T. FERNALD, Amherst, Mass.
1886. J. F. LOCKWOOD, New York City.
1887. C. F. STURTEVANT, Minneapolis, Minn.
1888. W. J. HANCOCK, Saco, Me.

GRADUATES.

CLASS OF 1872.

Name and Occupation. *Residence.*

Benjamin F. Gould, C. E., Farming and Real Estate, Holliston, California

George E. Hammond, C. E. Civil Engineer, Navy Yard, Portsmouth, N. H.

Edwin J. Haskell, B. S. Silk Manufacturer.....Saccarappa

Heddle Hilliard, C. E., Civil Engineer.....Oldtown

Eber D. Thomas, B. S., Civil Engineer..... Grand Rapids, Mich.

George O. Weston, B S., Farmer. ..... Norridgewock

CLASS OF 1873.

Russell W. Eaton, C. E., Supt. Merchant's M'f'g. Co. Montreal, Quebec

George H. Hamlin, C. E., Professor Civil Engineering, Maine State College, Orono

Fred W. Holt, C E., Supt. .... G. S. R. R., St. George, N. B.

John M. Oak, B. S., Salesman..... Bangor

*Charles E Reed, C. E., Agent Columbia Bridge Co., Dayton, Ohio

Frank Lamson Scribner, B. S., Professor, Botany and Horticultural University, Knoxville, Tenn.

Harvey B. Thayer, B S., Druggist .....Presque Isle

CLASS OF 1874.

William A. Allen, C. E., Chief Engineer, M. C. R. R.. .Portland

Walter Balentine, M. S., Professor of Agriculture, State College, Orono

William H. Gerrish B. S., M. D., Physician.... Merrimac, Mass.

John I. Gurney, B. S. Florist .....Dorchester, Mass.

David R. Hunter, B. S..... Oakland, Cal.

Louise H. Ramsdell, B. S., (Mrs. Milton D. Noyes, Farmer,) Atkinson

*Deceased.

CLASS OF 1875.

Name and Occupation. *Residence.*

Solomon W. Bates, C. E. Solicitor of Patents and Mechanical Engineer, Portland
Wilbur A. Bumps, C. E., M. D., Physician..... Dexter
*Samuel H. Clapp, C. E., Teacher..... Danvers, Mass.
Lewis F. Coburn, C. E. Civil Engineer ..... Crescent City, Cal.
Charles F. Colesworthy, B. S ..... Pendleton, Nevada
*Charles F. Durham, C. E., Teacher.. ..... Crescent City, Cal.
Alfred M. Goodale, B. S. Supt. Boston M'f'g Co., Waltham, Mass.
Edson F. Hitchings, C. E., Principal High School..Warren, Mass.
Whitman H. Jordan, M. S., Director Agricultural Experiment Station, Orono
Edward D. Mayo, M. E., Mill Furnisher and Draughtsman, Minneapolis, Minn.
Albert E. Mitchell, M. E., Mechanical Engineer....Altoona, Penn.
Allen G. Mitchell, C. E., Division Engineer, Pennsylvania Railroad, Cornellsville, Pa.
*Fred L. Moore, B. S , Teacher ..... California
Luther W. Rogers, B. S., Merchant ..... Waterville
Minott W. Sewall, M. E., Pneumatic Dynamite Gun Co., New York City.
George M. Shaw, C. E. Principal of Schools..... Oroville, Cal.
Wesley Webb, M. S., Editor Farm and Home ..... Dover, Del.
*Edgar A. Work, C. E.....U. S. Military Academy

CLASS OF 1876.

Edmund Abbott, B. S., M. D., Physician..... Providence, R. I.
Charles P. Allen, B. S. Lawyer and Banker.. ... .. Presque Isle
Elbridge H. Beckler, C. E., Chief Engineer, Mon. Cen. R'y, Helena, Mon.
Fred M. Bisbee, C. E., Druggist... ..... Wachita, Kansas
Edward M. Blanding, B. S., Editor Maine Industrial Journal, Bangor
Charles M. Brainard, B. S. Lumberman .....Skowhegan
*George H. Buker, B. S., Apothecary... .... Presque Isle
Florence H. Cowan, B. S., Teacher..... ...Lynn, Mass.

*Deceased.

Name and Occupation. *Residence.*

Oliver Crosby, M. E. Treasurer and Manager, American M'f'g. Co., St. Paul, Minn.
Vetal Cyr. B. S., Principal Madawaska Training School...Fort Kent
James E. Dike, C. E., City Engineer and County Surveyor, Devil's Lake, Dakota
*Willis O. Dike, B. S..... Gorham
Horace M. Estabrooke, M. S., Ass't Prin. Normal School, Gorham
Arthur M. Farrington, B. S., Ass't U. S. Dep't. of Animal Industry, B. V. S., Washington, D. C.
George O. Foss, C. E., Ass't Engineer, N. P. R. R...Butte, Mon.
William T. Haines, B. S., L. L. B., Lawyer..... Waterville
Henry F. Hamilton, B. S., D. D. S., Dentist.....Boston, Mass.
Newall P. Haskell, B. S., Farmer ..... Orono
Edward S. How, M. E., Office Light House Board, Treas. Dep't., Washington, D. C.
Philip W. Hubbard. B. S., Grocer ..... Alhambra, Cal.
Samuel M. Jones, M. E., Mechanical Engineer ..Worcester, Mass.
Albert A. Lewis, B. S., Clergyman..... Brewer
Herbert A. Long, M E., Farmer.. ..... Roque Island, Machias
Luther R. Lothrop, C. E., Division Engineer N. Pac. & Mon. R. R., Helena, Mon.
Nelson H. Martin, B. S., Teacher .. ..Ft. Fairfield
Charles E Oak, M. E., Lumberman .. .. Caribou
George D. Parks, C. E., Lawyer and Civil Engineer .. Brunswick
Hayward Pierce, B. S., West Waldo Granite Works. .. Frankfort
Frank R. Reed, C. E., Carpenter..... .....Roxbury
Henry J. Reynolds, B. S., Druggist ... ...Eastport
Charles W. Rogers, M. E., Mechanical Engineer ...Boston, Mass.
William L. Stevens, M. E., Commission Merchant, Minneapolis, Minn.
John H. Williams, B. S., Government Surveyor .....Dakota

CLASS OF 1877.

Alvah D. Blackington, C. E., Division Engineer, Erie R. R., Dunmore, Pa.
Robert B. Burns, C. E., Merchant .. .. Attica, Kansas

*Deceased.

Name and Occupation. *Residence.*

Eugene H. Dakin, B. S., Sec'y and Treas , Industrial Journal, Bangor
Edward F. Danforth, B. S., Lawyer . . . . . Skowhegan
Augustus J. Elkins, B. M. E., City Engineer, Fergus Falls, Minn.
Alicia T. Emery, B S . . . . . Orono
Samuel W. Gould, B S., Lawyer . . . . . Skowhegan
*Joseph C. Lunt, B. C. E., Civil Engineer, Mex. C. R. R., El Paso, Texas
Fred F. Phillips, B. S., Ins. Agent . . . . . Bangor
*Samuel Shaw, B. M. E , Architectural Draughtsman, Boston, Mass.
Frank P. Stone, B S., Farmer . . . . . Livermore Falls
Thomas J. Stevens, B. M. E., Druggist . . . . . Portland
George E. Sturgis, B. C. E., Druggist . . . . . Portland, Oregon
Charles E. Town, B. C E., U. S. Surveyor . . . . . Helena, Montana
James W. Weeks, B. M. E., Draughtsman . . . . Des Moines, Iowa
Nellie E. Weeks, B. S., (Mrs. Llewellyn Spencer) . . . . . Orono
Ivan E. Webster, B. S . . . . . Ashland, Wis.

CLASS OF 1878.

Emma Brown, B. S., Teacher, (Mrs. Charles Gilman) . . . Enfield
Andrew J. Caldwell, B. M. E., Mech. Engineer . . Brooklyn, N. Y.
Cecil C. Chamberlain, B. S., Merchant . . . . . Anoka, Minn.
George E. Fernald, B. C. E., Salesman . . . . . Waterloo, Iowa
James Heald, B. S., Civil Engineer, Seattle, Lake Shore and Eastern R. R., Seattle, Wash. T.
John Locke, B. S . . . . . With Maine Central R. R., Portland
Frank J. Oakes, B. C. E., Draughtsman . . . . Brooklyn, N. Y.
John C. Patterson, B. C. E., Assistant Engineer, St. P., M. & M. R. R., St. Paul, Minn.
Winfield E. Tripp, B. C. E., Law Student, State University, Madison, Wis.
Edward C. Walker, B. S., Lawyer . . . . . Lovell
Otis C. Webster, B. S., Druggist . . . . . Augusta

CLASS OF 1879.

Harry P. Bean, C. E., Ass't Engineer, N. B. R. R., Woodstock, N. B.

*Deceased.

Name and Occupation. *Residence.*

Edward J. Blake, C. E., Chief Engineer, St. J. & C. B. Railway, St. Joseph, Mo.
Simon P. Crosby, B. S., Lawyer ..... St. Paul, Minn.
John D. Cutter, B. S., M. D., Physician ..... Chicago, Ill.
Wilbur F. Decker, M. E., Mech. Engineer .. Minneapolis, Minn.
David A. Decrow, B. C. E., Holly M'f'g Company, Lockport, New York
Willis E. Ferguson, B. S., Farming and Real Estate, Alhambra, California
Charles W. Gibbs, C. E., Chief Engineer, Silverton R. R , Silverton, Col.
Annie M. Gould B. S., (Mrs. Loomis F. Goodale) Monument, Colorado
*Nellie M. Holt, B. S., Teacher..... Orono
Frank E. Kidder, C. E., Architect..... Denver, Colorado
Mark D. Libby, B. C. E., Lawyer ..... Kingman, Kan.
*Charles S. Loring, B. M. E., Machinist..... Lewiston
George P. Merrill, M. S., Curator, Nat. Museum, Washington, D. C.
John W. Meserve, B. M. E., Chief Draughtsman, Yale & Towne M'f'g Co., Stamford, Conn.
Arthur L. Moore, B. S., Farmer..... Waterville
Charles A. Morse, C. E., Div. Engineer, A. T. & S. F. R. R., Topeka, Kansas
Fred D. Potter, B. M. E , Engineer and Contractor, New York City
Alton J. Shaw, B. M. E., Draughtsman, E. P. Allis & Co., Milwaukee, Wis.
Percia A. Vinal, M. S., (Mrs. Albert White) ..... Orono
George O. Warren, B. S., Farmer..... Fryeburg
Herbert Webster, B. S., Grocer..... Alhambra, Cal.

CLASS OF 1880.

Horace W. Atwood, B. S., D. V. S. Veterinary Surgeon Brockton, Mass.
James M. Bartlett, M. S., Analytical Chemist, Agricultural Experiment Station, Orono
Albert H. Brown, B. S., Banker..... Oldtown

*Deceased.

Name and Occupation. *Residence.*

Marcia Davis, B. S., Clerk, Office Registry of Deeds, West Bay City, Michigan
Fred B. Elliot, B. S. Farmer... .....Bowdoinham
Sarah P. Farrington, B. S., (Mrs. George P. Merrill), Washington, D. C.
Charles W. Fernald, B. S., Merchant .. .. So. Levant
Fred W. Fickett, M. S., Farmer and Lawyer ...Galveston, Texas
George W. Lufkin, B. C. E., Asst. Engineer W. & N. R. R. Wilmington, Del.
Frank A. Mansfield, M. S., Clergyman.....Boston, Mass.
Annie A Matthews, B. S. Teacher..... Stillwater
Henry W. Murray, B. C. E., Teacher .....Nappa City, California
Franklin R. Patten, C. E., Supt. Iron Works, Barnston, Chester County, Pa.
Charles T. Pease, B. S. Division Engineer C. K. & N. R. R. Denver, Colorado
James F. Purington, B. S., Farmer..... .Bowdoin

CLASS OF 1881.

Henry H. Andrews, M. E. Bank Cashier..... ...Callaway, Neb.
Henry W. Brown, M. S., Instructor Metaphysics, Literary Institute, New Hampton, N. H.
Clara L Buck, B. S., (Mrs. Thomas W. Hine)..Phœnix, Arizona
Fannie E. Colburn, B. S., (Mrs. Arthur L. Fernald), Omaha, Nebraska
Edward H. Farrington, M. S., Chemist, Agricultural Experiment Station, Hanover, N. H.
Oliver C. Farrington, M. S. Post Graduate, Yale College New Haven, Conn.
Charles H. Fogg, B. C. E., Div. Supt., Penn. R. R., Greensburg, Pa.
Aldana T. Ingalls, B. C. E..... So. Bridgton
Robert J. Johnson, B. C. E., City Engineer Dep't..St. Paul, Minn.
Clara A. Libby, B. S., Millinery and Fancy Goods... ...Augusta
Horace F. McIntire, B. M. E., Millwright.... ....Waldoborough
Charles L. Moor, B. C. E., Lumber Business..... ....Hartland
*Benjamin F. Murray, B. C. E... ... .Stillwater

*Deceased.

Name and Occupation. *Residence.*

Edwin W. Osborne, B. C. E., N. Pacific R. R. ... Brainard, Minn.
Oscar L. Pease, B. S., Station Agent So. Pac. R. R.
Gila Bend, Arizona
Harold M. Plaisted, B. M. E. (M. E., Stevens Institute)
with Barney & Smith M'f'g. Co., Dayton, Ohio
Alice I. Ring, B. S ... Orono
Mary L. Ring, B. S., Teacher ... Orono
*Roscoe L. Smith, B. S., Farmer ... Lewiston
George W. Sturtevant, B. C. E., Civil Engineer and
Contractor, Minneapolis, Minn.
Frank S. Wade, B. S., M. D., Physician ... Richmond, Wis.
Walter A White, B. C. E., L. L. B. Lawyer ... Newport
*John B. Wilson, B. S., Medical Student ... Orono
Levi A. Wyman, B. C. E., Lawyer and Civil Engineer ... Ellsworth

CLASS OF 1882.

Charles S Bickford, B. S., Salesman ... Belfast
Jacob L. Boynton, B. S ... Marlboro, Mass.
Charles W. Brown, B. M. E., Draughtsman ... Indianapolis, Ind.
Stephen J. Buzzell, B. C. E., Civil Engineer ... Argyle
Oscar H Dunton, B. M. E., Draughtsman,
With Harris Corliss Engine Co., Providence, R. I.
Walter Flint, M. E., Professor Mech. Engineering, M. S. C., Orono
George R. Fuller, B. S., Lawyer ... Tremont
Charles C. Garland, B. S., Banker and Dealer in Pine Lands,
Minneapolis, Minn.
Joseph F. Gould, B. S., Lawyer ... Bangor
Thomas W. Hine, B. S., Lawyer and Banker ... Phœnix, Arizona
Will R. Howard, B. S., Principal Eng. Dep't Mil. Academy,
Highland Park, Ill.
Alonzo L. Hurd, B. S., Hampden Watch Co ... Canton, Ohio
Alfred J. Keith, B. C. E., Civil Engineer ... Oldtown
Frank I. Kimball, C. E., Mining Engineer ... Greensburg, Pa.
James H. Patten, B. S., M. D., Physician ... Ellsworth
Frederic M. Reed, B. M. E., Draughtsman,
B. & S. M'f'g Co., Providence, R. I.
Gleason C. Snow, B. S., Farmer ... North Orrington
Avery P. Starrett, B. S., Farmer ... Warren

*Deceased.

Name and Occupation. *Residence.*

Frank H. Todd, B. C. E., City Engineer.....St. Cloud, Minn.
Eben C. Webster, B. S., Lumber Manufacturer.....Orono
Willard A. Wight, B. C. E., Supt. Gas Works.....Trinidad, Col.
Daniel C. Woodward, B. M. E., Draughtsman....Milwaukee, Wis.

CLASS OF 1883.

James H. Cain, B. S., Time Keeper.....Great Works
Jonathan V. Cilley, B. C. E., Railroad Engineer,
Buenos Ayres, Arg. Rep., S. A.
Frank E. Emery, B. S., Superintendent Farm,
N. Y. Agricultural Expt. Station, Geneva, N. Y.
Arthur L. Fernald, B. S., Salesman ... . Omaha, Nebraska
Bartholomew P. Kelleher, B. S., M. D., Physician.....Orono
Lucius H. Merrill, B. S., Analytical Chemist,
Agricultural Experiment Station, Orono
Jennie C. Michaels, B. S., Teacher.....Stillwater
Charles W. Mullen, B. C. E., Civil Engineer.....Oldtown
Truman M. Patten, B. C. E., Civil Engineer.....Bruce, Wis.
Harry W. Powers, B. S., Manufacturer.....Orono
Charles E. Putnam, B. C. E., Civil Engineer,
Franklin Park, Boston, Mass.
Lewis Robinson, Jr., B. M. E., M. D., Physician..... Bangor
George A. Sutton, B. C. E., Merchant.....Abbot
Levi W. Taylor, M. S., Principal Com. Dep't,
M. C. Institute, Pittsfield

CLASS OF 1884.

George H. Allan, B S., Lawyer..... Portland
*Will H. Burleigh, B. C. E. .... Vassalboro'
Mary F. Conroy, B. S., Deputy, Post Office ..... Orono
Leslie W. Cutter, B. C. E., Contractor and Builder.....Bangor
Harriet C. Fernald, M. S., Assistant Librarian,
Maine State College, Orono
Elmer E. Hatch, B. S., Farmer..... Roseland, Mon.
John E. Hill, B. C. E , U. S. Signal Service, Fort Tossen, Dak. Ter.
Joseph G. Kelley, B. C. E., Civil Engineer..... Bar Harbor
Edwin F. Ladd, B. S., Chemist, Experiment Station,
Geneva, N. Y.

*Deceased.

Name and Occupation. *Residence.*

Clarence S. Lunt, B. C. E., City Editor Commercial ..... Bangor
Fred L. Stevens, B. S., Medical Student..... ..... Temple
William Webber, B. M. E., Draughtsman, McCormick H. M. Works, Chicago, Ill.

CLASS OF 1885.

George W. Chamberlain, B. S., Principal Grammar School, Farmington, N. H.
Asher Dole, B. C. E., Civil Engineer..... .. Butte, Mon.
Frank O. Dutton, B. S , Teacher..... ..... Orono
Henry T. Fernald, M. S., Post Graduate in Biology, Johns Hopkins University, Baltimore, Md.
Elmer O. Goodridge, M. E., Ass't Engineer, Mon. Cen. Railway, Helena, Montana
George L. Hanscom, B. S., Clegyman..... Bliss, N. Y.
James N. Hart, B. C. E., Instructor, Maine State College.. Orono
Frank E. Hull, B. C. E., Civil Engineer..... ..... Monson
Austin H. Keyes, B. C. E., Book-Keeper, E. P. Allis & Co., Milwaukee, Wis.
William Morey, Jr., B. C. E., Draughtsman, U. S. Signal Office, Washington, D. C.
Joseph P. Moulton, B. S., Farmer..... Springvale
Leonard G. Paine, M. E., Draughtsman, Pratt & Whitney Co., Hartford, Conn.
Elmer E. Pennell, B. M. E., Machinist, Locomotive Works, Providence, R. I.
Louis W. Riggs, B. M. E., Instructor Chemistry and Physics, Mt. Hermon, Mass.
Fremont L. Russell, B. S., D. V. S., Veterinarian to Agricultural Experiment Station, Orono

CLASS OF 1886.

Bert J. Allan, B. C. E., Civil Engineer ..... Boston, Mass.
Josiah M. Ayer, B. C. E., Chief Draughtsman Boston Heating Co., Boston. Mass.
George G. Barker, B. M. E., Draughtsman, McCormick H. M. Co., Chicago, Ill.
George F. Biack, B. C. E., Asst. Engineer, M. C. R. R..Portland

Name and Occupation. *Residence.*

John D Blagden, B. C. E., U. S. Signal Service, Hatteras..N. C.
Heywood S. French, B. C. E., Civil Engineer ..... Boston, Mass.
Edwin D. Graves, B. C. E., Civil Engineer, Somerset R. R.,
No. Anson
Ralph K. Jones, B. S., With Kellogg M'f'g Co.. ...Findlay, Ohio
Elmer Lenfest, B. C. E., Civil Engineer, Mon. Cen. Railway,
Helena, Mon.
James F. Lockwood, B. M. E., Draughtsman.....New York City
George F. Lull, B. S., Chemist, Penobscot Chem. Fibre Co.,
West Great Works
Willis H. Merriam, B. C. E., Law Student ... Minneapolis, Minn.
Elmer E. Merritt, B. M. E., Draughtsman, McCormick H. M. Co ,
Chicago, Ill.
Arthur D. Page, B. C. E., Civil Engineer.....St. Cloud, Minn.
Irving B. Ray, B. C. E..... .....Harrington
Sidney S. Twombly, B. S., Adj. Prof. of Chem. and Ag.
Ind. University, and Vice Director Ag. Expt. Station,
Fayetteville, Ark.

CLASS OF 1887.

John H. Burleigh, B. C. E., Civil Engineer.. .... Chelsea, Mass.
Luis V. P. Cilley, B. C. E., Civil Engineer,
Buenos Ayres, Argentine Republic, S. A.
Bert E. Clark, B. S., Teacher ... .West Tremont
Daniel W. Colby, B S., Post Graduate, Cornell University,
Ithaca, N. Y.
Edwin V. Coffin, B. C. E., Clerk .....Harrington
Alice A. Hicks, B. S., Principal High School..... .....Veazie
James D. Lazell, B. M. E., Draughtsman.....Philadelphia, Pa.
Charles A. Mason, B. C. E., Civil Engineer. .. Los Angeles, Cal.
Henry A. McNally, B. C. E., U. S. Signal Service,
Milwaukee, Wis.
Fenton Merrill, B. C. E., Civil Engineer ... ...Lewiston
Addison R. Saunders, B. M. E., Mech. Engineer .. ... Oldtown
Cassius A. Sears, B. C. E .. .. Seattle, Wash. Ter.
Charles H. Stevens, B. M. E., Manufacturer..... Fort Fairfield
Charles F. Sturtevant, B. C. E., Civil Engineer,
Minneapolis, Minn.
Frank E. Trask, B. C. E., Civil Engineer .....Pomona, Cal.

Name and Occupation. *Residence.*

Charles T. Vose, B. C. E., Ass't Engineer,
W. & N. R. R., Wilmington, Del.
Howard S. Webb, B. M. E., Instructor in Shop Work,
Maine State College, Orono
John S. Williams, B. S., Principal High School.....Guilford

CLASS OF 1888.

Andrews, Hiram Bertrand, Draughtsman.....Chelsea, Mass.
Bachelder, John Stetson, Draughtsman, Bango Mrach'e Co., Bangor
Blanchard, Charles DeWitt, Civil Engineer.....Old Town
Boardman, John Russell, with Kennebec Journal.....Augusta
Brick, Francis Stephen, Prin. High School.....No. New Portland
Butler, Harry, Instructor, Academy.....Hampden
Campbell, Dudley Elmer, Civil Engineer.....Skowhegan
Eastman, Fred Langdon, Draughtsman,
A. T. & S. F. Machine Shop, Topeka, Kan.
Elwell, Edward Henry, Jr., with Transcript.....Portland
Hancock, William Jerome.....Saco
Hatch, John Wood, Post Graduate, Buzzey Institute,
Harvard University, Jamaica Plain, Mass.
Howes, Claude Lorraine.....Boston, Mass.
Lincoln, Harry Foster.....Dennysville
Lord, Thomas George, Farmer.....Skowhegan
Marsh, Ralph Hemenway, Prin. High School.....Tremont
Miller, Seymore Farrington, Draughtsman.....Chelsea, Mass.
Philbrook, William, Civil Engineer.....Bethel
Rogers, Seymour Everett, Mechanical Engineer.....Stetson
Seabury, George Edwin, Pattern Maker,
Waterville Iron Co., Waterville
Small, Frank Llewellyn.....Freeport
Smith, Frank Adelbert, Civil Engineer.....East Corinth
Wilson, Nathaniel Estes, Ass't Chemist and Dairy Supt.,
Agricultural Experiment Station, Burlington, Vt.

NON-GRADUATES.

Average period of attendance, one and a half years.

Present residence not being known, the former residence is given.

Special students are marked in the classes with which they principally recited.

[Corrections for a revised list are solicited.]

CLASS OF 1872.

Name and Occupation.	*Residence.*
John T. Bowler, Register of Deeds	Bangor
William H. Cary, Jr	St. Paul, Minn.
Edward F. Fisher	San Diego, Cal.
William H. George, Clergyman	Topeka, Kansas
William L. Harlow, Farmer	Buckfield
George L. Macomber	Durham
Charles C. Norton	Buffalo Meadows, Nevada
William B. Oleson, Clergyman	Honolulu, Sandwich Islands
Frank W. Rollins, Teacher	Stillwater, Minn.
Oren S. Sargent, M. D., Physician	Lawrence, Mass.
*Marcus P. Shorey	Old Town
Benjamin F. Watson, Farmer	Levant

CLASS OF 1873.

William H. Claflin, Merchant	Boston
Joseph E. P. Clark, Book Business	Minneapolis, Minn.
*John Jackson	Alfred
Samuel Lane, Insurance Agent	Houlton
Wilbur F. Lovejoy, Book-Keeper	Winn

*Deceased.

Name and Occupation.	*Residence.*
Thomas P. Pease	Bridgton
Clarence Pullen, Civil Engineer	Foxcroft
Frederic A. Ransom	Augusta

CLASS OF 1874.

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

CLASS OF 1875.

Gustavus Bellows, Farmer; Specialty, Fruit	Freedom
Leander H. Blossom, Farmer	Turner
John H. Carver, Clerk	Boston, Mass.
William B. Dole, Mechanic	Bangor
George N. Gage, Physician	E. Washington, N. H.
Benson H. Ham, Merchant	Charleston
Alton A. Jackson, M. D., Physician	E. Jefferson
Manley Jackson, Organ and Sewing Machine Business	Jefferson
Freeland Jones, Merchant and Surveyor	Caribou
Ora Oak	Caribou
Sidney S. Soule, Farmer	Freeport
Louis C. Southard, Lawyer, Boston,	Residence, North Easton, Mass.
*George W. Spratt, Merchant	Bangor
Charles H. Spring, Wool Grower, Buenos Ayres, Arg. Rep., S. A.	

*Deceased.

CLASS OF 1876.

Name and Occupation.	*Residence.*
Francis H. Bacon, Architect	Boston, Mass.
Russell A. Carver	Dixfield
Frank P. Gurney, Farmer	Dover, Dakota
*Frank A. Hazeltine, Farmer	Dexter
Eugene L. Hopkins	Old Town
James W. Linnell, Farmer	Exeter
George J. Moody, Lawyer	Montesano, Wash. Ter.
Webster Mudgett	Albion
Edward B. Pillsbury, Manager Postal Tel. Co	Boston, Mass.
Randall H. Rines, Merchant, (Rines Brothers)	Portland
Walter F. Robinson, Signal Service	Fort Apache, Arizona
Edward C. Shaw, Draughtsman	Providence, R. I.
Frank E. Southard, Lawyer	Augusta
Frank P. Whitaker, Physician	Hermon

CLASS OF 1877.

Charles F. Andrews	Biddeford
Fred S. Bunker, (A. B., Harvard)	City Hospital, Boston, Mass.
*Edson C. Chase	Stillwater
William W. Dow, Printer	Rehoboth, Mass.
James T. Emery	Stillwater
Charles M. Freeman	Portland
*Frank H. Goud, Clerk	Fort Fairfield
Austin I. Harvey, M.D., Physician	Carmel
Menzies F. Herring, Editor and Publisher	Dexter
Ardean Lovejoy	Orono
Fred B. Mallett, Lumbering Business	Minneapolis, Minn.
Fred L. Partridge	Stockton
Fred H. Pullen	Foxcroft
*Frank E. Reed	Springfield
Woodbury D. Roberts, Merchant	Cheney, Wyoming
Thomas B. Seavey, Clerk	Chicago, Ill.
Henry C. Townsend, Farmer	Fort Fairfield
Clara E. Webb, Teacher	Unity

*Deceased.

Name and Occupation.	*Residence.*
Fred S. Wiggin, Farmer	Presque Isle
William B. Whitney	Iowa

CLASS OF 1878.

Charles H. Benjamin, M. E.	Boston, Mass.
Eugene M. Berry	Sumner
*Nathaniel A. Crocker	W. Enfield
Charles C. Elwell, Ass't Engineer, W. & N. R. R.	Wilmington, Del.
Howard H. Hartwell	Vinalhaven
John E. Haynes, Jeweller	Old Town
Fred H. Hinckley, Clerk in U. S. Land Office	Eureka, Nev.
Richard S. Howe	Fryeburg
Samuel C. Jameson, Boot and Shoe Dealer	Providence, R. I.
William S. Jameson, Dealer in Sugar Machinery	Guadalajara, Mex.
Edgar H Lancaster, Mechanic in R. R. Shop	Old Town
*Alvra W. Leathers	Dover
James Lunt	Bangor
Herbert A. Mallett, Lumberman	Stillwater, Minn.
Silas N. Miller, Prospecting for Gold and Silver	Fairplay, Colorado
Frank J. Perkins, Dry Goods Dealer	Old Town
Charles F. Plumley, Merchant	Lincoln
John O. Richardson, Trader, Paints and Oil	Old Town
A. Judson Small	No. Lubec
Albert H. Stewart, Piano Regulator	Boston, Mass.
Edson Warriner, Watchmaker and Jeweller	Fryeburg
Erastus G. Weeks, Merchant	Jefferson

CLASS OF 1879.

Daniel Allison	Linneus
Arthur P. Brown, Mechanic	Orono
Benjamin V. Carver, Machinist	Hartford, Conn.
Byron H. Cochrane	Woonsocket, R. I.
Fred A. Colburn, Clerk and Scaler	Stillwater, Minn.
James W. Cousens, Teacher	Stillwater, Minn.
John A. Curtis, U. S. Deputy Surveyor	Phœnix, Arizona
George A. Dustin, Machinist and Trader	Dexter

*Deceased.

Name and Occupation.	*Residence.*
Loomis F. Goodale, Div. Eng., D. & S. F. R. R.,	Monument, Col.
Edwin A. Hawes, Mechanic	Ontario, Cal.
*Edwin C. Johnson	Gorham
John N. Knapp	Bradley
Oliver S. Jones, Farmer	Corinna
Albert Y. Merrill, Lawyer, Judge of Probate	Aitkin, Minn.
Asa C. Morton, Clerk	Bangor
Harry W. Peakes, Merchant	Charleston
David S. Plummer, Book-Keeper	Boston, Mass.
*Eugene G. Smith	Richmond
William N. Titus, Lawyer, Boston	Residence, Woburn, Mass.
Howard E. Webster, Lumberman	Orono
Arthur L. Wellington, Shipping Agent	Detroit, Mich.
Charles M. Wilson	San Francisco, Cal.

CLASS OF 1880.

Charles M. Allen, Teacher	Kingston, Penn.
Edward N. Atwood	Portland
Granville Austin, Salesman	Boston, Mass.
Sylvester A. Brown, Clerk	Boston, Mass.
*Ada M. L. Buswell, Teacher	Minneapolis, Minn.
Charles E. Cheney, Farmer	W. Scarboro'
Woodbury F. Cleveland, M. D., Physician	Eastport
Samuel H. Dyer	Yarmouth
Osgood E. Fuller, Druggist	Albany, N. Y.
Harry H. Goodwin, Sec'y to Amer. Consulate	Anaberg, Saxony
John B. Horton, Book-Keeper	Sandusky, Ohio
Daniel S. Jones, Watchmaker and Jeweller	Kansas
Prescott Keyes, Jr., Farmer	Richmond
*Charles W. Nash	Addison
Willis L. Oak, Clerk	Presque Isle
Fred W. Powers, Farmer and Teacher	Fryeburg
Emily I. Ramsdell, Teacher	Atkinson
Mortier C. Randall	Stillwater
William J. Rich, Chemist, Cambria Iron Co.	Johnstown, Pa.
Charles S. Simpson, Civil Engineer and County Surveyor,	Florence, Wis.

*Deceased.

Name and Occupation.	*Residence.*
Frank A. Spratt, A. B., Principal Academy	Hampden
Daniel Webster, Express Agent	Augusta
Arthur Wentworth	Orrington

CLASS OF 1881.

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

CLASS OF 1882.

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

*Deceased.

Name and Occupation.	*Residence.*
Frederick A. Kenniston, Salesman	Brockton, Mass.
Frederick O. Kent	Bremen
Walter H. Nason, M. D., Physician	Hampden
Atta L Nutter, Teacher	Wilmington, N. C.
Parker J. Page	Orono
Harry K. Poole	Bremen
Louis K. Tilley, Farmer	Castle Hill

CLASS OF 1883.

George R. Currier, Teacher	E. Wilton
Arthur T. Drummond, Farmer	Sidney
William E. Emery, M. D., Physician	Surry
Norman F. Kelsea, Clerk	Brockton, Mass.
Edwin P. Kendall, Farmer and Miller	Bowdoinham
Henry W. Longfellow, Clerk	Machias
Charles S. Murray	Stillwater
George A. Rich, A. B., On Editorial Staff Journal	Boston, Mass.
Everett F. Rich, Clerk	Bangor
Ralph Starbird, Lumber Dealer	San Francisco Cal.
Ralph R. Ulmer, Lawyer and Clerk of Court	Rockland
Frank C. Webster, Clerk, American Express Co	Bangor
Frank G. Webster, Clerk.	Orono
Lewis H. White, M. D., Physician	Lincoln Center

CLASS OF 1884.

Edward S. Abbott, M. D , Physician	Bridgton
Edward M. Bailey, Merchant.	Bangor
Joseph B. Bartlett	Nottingham, N. H.
William A. Berry	Hampden
James A. Dunning, Clerk	Bangor
Freeland Ellis, Clerk.	Guilford
Eugene L. Folsom, Machinist	Stillwater
Evie M. Hamblen	Stillwater
Robert S. Leighton	Steuben
*Gilbert Longfellow, Jr.	Machias
Cephas R. Moore, Merchant and Postmaster	Anson

*Deceased.

Name and Occupation.	*Residence.*
William R. Pattangall	Peterboro, N. H.
Robert C. Patterson, Stenographer	St. Paul, Minn.
Charles S. Pendleton, Farmer	Philbrook, Montana
Herbert L. Rich, Ins. Nat. Sci. Laselle Acad'y	Auburndale, Mass.
Flora M. Ricker (Mrs. P. J. Page)	Orono
Warren J. Ridley, Conductor, Street R. R.	South Boston, Mass.
Elmer A. Savage	Minneapolis, Minn.
Mertie Sawyer	Hampden
Charles F. Smith, Prin. High School	Lenox, Mass.
*Horace G. Trueworthy	Orono
Jotham Whipple, Jr.	Solon

CLASS OF 1885.

James W. Bishop, Farmer	Milo
Frederick H. Butler, Division Engineer, T St. L. & K. C. R. R.	Charleston, Ill.
Harry W. Davis, Banker	Church's Ferry, Dakota
Fred W. Dickerson	Belfast
Samuel W. Hill	Machias
Willard A. Libby	Denver, Col.
Charles L. Libby, Draughtsman	Bridgeport, Conn.
*Frank E. Manter	Milo
Dennis D. Merrill, Engineer, Steam Mill	Stillwater
Dudley W. Moor, Jr.	Waterville
Carl H. Prince, Farmer	Turner
Elisha C. Vose, U. S. Signal Service and Journalist	Chicago, Ill.

CLASS OF 1886.

Eugene C. Bartlett, Medical Student	Orono
John I. Chase, Clerk	Riverside, Cal.
Charles H. Merriam	Fort Laramie, Wyoming Ter.
Harry E. Powers.	Bowdoinham
Harold E. Trueworthy	Houlton

*Deceased.

CLASS OF 1887.

Name and Occupation.	*Residence.*
Alton D. Adams, N. E. Wiring Co.	Boston, Mass.
John W. Allen	Presque Isle
Alice Benjamin	Oakland
Irving M. Clark, Civil Engineer	Boston, Mass.
Jennie L. Dority	Wells
Wm. J. Harris	Groton, Mass.
Austin D. Houghton	Waterville
James S. Kennedy	Ludlow
William L. Perham	Paris
Wm. P. Sherburn	Dover
Frank L. Tucker	Norway
Charles W. Wentworth, Lawyer	Hudson, Mass.
Rodney A. B. Young, Medical Student	Baltimore, Md.
Alfred S. Ruth	Kamilche, Mason Co., Wash. Ter.

CLASS OF 1888.

Charles W. Breed, Clerk	Philadelphia, Pa.
Albion H. Buker	Boston, Mass.
James K. Chamberlain, Plumber and Sanitary Engineer	Bangor
Frank P. Collins	Ft. Fairfield
Fred T. Drew	Orono
George K. Hagerthy	So. Hancock
Fred H. Kirkpatrick	Bangor
Hannah E. Leavitt (Mrs. Walter Flint)	Orono
Edwin B. Lord	Stillwater
Alphonso F. Marsh, Clerk	Old Town
Frank J. Page	Orono
Henry F. Perkins, Mechanic	Oakland
Nathan A. Ring	Orono
Clara Rogers	Hampden
Charles C. Rolfe, Teacher	Presque Isle
Abram W. Sargent	Seattle, W. T.
Joseph S. True, Farmer	New Gloucester
Ernest H. Turnbull	St. John, N. B.

CLASS OF 1889.

Name and Occupation.	*Residence.*
Benjamin R. Clark	No. Lubec
George G. Fernald	Wilton
Arthur M. Folsom	Old Town
Charles B. Gould	Orono
Temple Grosvenor	Canterbury, N. B.
Lewis F. Johnson	LaGrange
John E. Littlefield	Brewer
Albert L. Lyford, Prin. Com. Dept., Maine Wesleyan Seminary,	Kent's Hill
*Maude A. Matthews	Stillwater, Me.
Frederick L. Thompson, Medical Student	Augusta
Norman Tripp	Unity
Fred H. Webb, Mechanical Engineer	Skowhegan

CLASS OF 1890.

George W. Hodgdon	Rumford
Herbert B. Rowell	Solon

CLASS OF 1891.

Robert W. Fuller	Newtonville, Mass.
Byron C. Hodgkins	Stillwater, Me.
Joseph M. Jackson	Boothbay
Robert M. Packard	Rockland

*Deceased.

CALENDAR.

1889—Feb. 5,	Tuesday, Second Term commences.
June 20, 21,	Thursday and Friday, Examinations.
" 22,	Saturday, Prize Declamations by Sophomores.
" 23,	Sunday, Baccalaureate Address.
" 24,	Monday, Prize Essays by Juniors.
" 26,	Wednesday, Commencement.
" 28,	Friday, Examination of Candidates for Admission.
	Vacation of five weeks.
Aug. 6,	Tuesday, Examination of Candidates for Admission.
	First Term commences.
Nov. 25, 26,	Monday and Tuesday, Examinations.
	Vacation of eleven weeks.
1890—Feb. 4,	Tuesday, Second Term commences.

DEDICATION

OF

COBURN HALL.

MAINE STATE COLLEGE

OF

Agriculture and the Mechanic Arts,

ORONO, ME.

DEDICATION OF COBURN HALL,

June 26, 1888.

PROGRAMME.

Music.

Address of Welcome, President FERNALD.

Prayer, Rev. C. F. ALLEN, D.D.

Music

Historical Address, Hon. LYNDON OAK, President of Trustees.

Music.

Report of Building Committee, WM. T. HAINES, Esq., Chairman.

Presentation of Keys, Governor MARBLE.

Responses of Acceptance,

President FERNALD, Prof. HARVEY, Prof. BALENTINE.

Music.

Congratulatory Addresses,

Senator LIBBEY, of Penobscot.

Senator HEATH, of Kennebec.

Representative LIBBY, of Burnham.

Representative CUSHING, of Turner.

Music.

Brief Addresses by H. M. ESTABROOKE, M. S., for the Alumni, and by other friends of the College.

Singing of Ode.

Benediction.

ODE.

By Mrs M. C. Fernald. Air, "The Old Oaken Bucket."

A full score of years, with their records, have entered
Eternity's gate, since men wise in their day,
With hearts in the weal of posterity centered,
Here planted good seed to be fostered for aye,—
Good seed that was precious beyond common knowing,
Long nourished in darkness and watered with tears;
Its sunshine, the faith of a few in its growing,
Its culture, the courage that yields not to fears.

But e'en while the germ of rich promise seemed sleeping,
To childish impatience for growth without time,
Who holds all right efforts in vigilant keeping,
He blessed the young plant and *He* taught it to climb.
Its strong roots out-reaching, its bright blades up-springing,
At length its fair fruitage appeared to the sight.
The years, as they pass, richer harvests are bringing,
Their God-given increase we hail with delight.

With praise for the past to the bounteous *Giver*,
With trust for the future, in gladness we meet
On the beautiful banks of the still-flowing river,
Our sheaves, with rejoicing, to lay at *His* feet.
Our ardor renewed by *His* promise of blessing
To those who are faithful in service, tho' small.
True hearts and firm hands to our labors addressing,
May harvests here reaped be the glory of all.

The principal addresses or abstracts of them will be found in this report.

In the absence of His Excellency, the Governor of the State, the keys of Coburn Hall were presented by Hon. Hannibal Hamlin, of Bangor, first President of the Board of Trustees.

It is a source of regret that the very fitting address by Mr. Hamlin cannot now be reproduced.

Of the responses of acceptance, that of Prof. Harvey alone is furnished for publication.

Representative Libby, of Burnham, was absent from the State.

On account of the lateness of the hour when Mr. H. M. Estabrooke was called to speak for the alumni, he made only brief remarks, instead of presenting the more formal paper designed. Besides the addresses given, brief congratulatory remarks were made by Rev. Mr. Davidson, of Greenville, Major Dickey, of Fort Kent, and Rev. Dr. Pepper, of Waterville, President of Colby University. Formal congratulations by many other friends of the college present, were prevented by the fullness of the programme, the carrying out of which held the audience to a late hour.

The personnel of the assembly is indicated by the following extract, regarding the dedication of Coburn Hall, from the *Maine Farmer*, June 28, 1888:

"Prominent individuals from all sections of the State were present. Among them were Councillors Lord, Carter, Wood, and Warren, with their ladies; Messrs. Burr, Campbell, Blossom, Watson, and McKeen, of the State Board of Agriculture; J. W. True, Esq., New Gloucester, of the Executive Committee of the Pomological Society; Chaplain O. H. Hancock, Saco, of the State Grange; President J. Henry Moore, of the Kennebec Agricultural Society; members of the Legislature, Senate, and House, from York to Fort Kent, and many others interested in the institution."

ADDRESS OF WELCOME.

By President FERNALD.

Gentlemen and Ladies: It is not more a pleasing duty than a grateful privilege to welcome you to this hall and to these ceremonies of dedication. The event which calls us together is one to which those officially connected with the college have long looked forward with lively interest.

It seems a fitting consummation of two decades of the college history, the dedication for all the future, or so long as brick and stone endure, of this beautiful edifice to the important purposes for which it has been erected.

It is gratifying to us to welcome to the college and to these exercises so many of the members of the legislature,

who voted the appropriation which rendered the construction of this building possible.

It is gratifying to us to make welcome so many representatives of the societies and organizations which have to do with the agricultural and other allied interests of the State.

It affords us special gratification, also, to welcome officers of the State, past and present, early trustees of the college, past instructors, alumni, and all those earnest friends of the institution who, in the halls of legislation or elsewhere, by voice or vote, have labored in its behalf.

We heartily welcome, also, all its other friends who grace this occasion by their presence, and assure you all that we deem ourselves honored by this representative gathering, met to dedicate and consecrate this building to the high purposes for which it has been designed.

In extending my own sincere and cordial salutations, I desire to say to the friends present that the college you look upon to-day, is not the college of twenty years ago. The most of these buildings and this beautiful campus which are now its pride, were not then here, or to the extent to which they existed, were in different condition from that which you behold to-day.

A single building, and a single instructor in that building, with a dozen young men before him, constituted the college, so far as the work of the class-room was concerned.

Not then, as to-day, did it have the strong backing of a sturdy line of alumni, making for themselves a name and a fame in the world,—that unfailing source of strength to any institution. Not then, as to-day, did it have the favoring sympathy of active and earnest friends throughout the State. Its early years were years of trial, but, thank God, not of discouragement to any one connected with it.

Fortunately for it, its instructors have possessed a genius for hard work, and its trustees and other friends have been unflinching in their loyalty and devotion to it. Its growth has been slow, but it has been real, and steady, and vital. It has been a growth from within and not from without. In the

development of its courses of study, buildings have been erected and appliances for aiding instruction have been added, always in response to an internal demand, or a growth from within that could no longer be resisted. Hence you will find upon the college campus little for ornament, everything for utility.

One other element of prosperity and source of strength I should not fail to mention. Its products have been constantly wanted in the market. Not unfrequently, even before graduation, its students have been called to important and responsible positions, and its graduates have been constantly in active demand for the varied fields of industry for which their training here had prepared them.

Two limitations to its prosperity, which time may be expected to remove, demand a moment's attention. The one has been its want of means, the other the limited information in regard to it, or want of acquaintance with it. Through all the years of its history it has been noticeable that, as men have become acquainted with it and comprehended the work it was accomplishing, they have come to be friendly to it and favorable to its support.

The removing of the latter limitation is certain to secure the removing of the former, and to insure for the college an era of still larger usefulness.

We are glad to welcome at all times the people of the State to the college grounds and to the college halls.

We are happy in the privilege of welcoming so many of its earnest friends to-day. We trust this occasion may prove to be one pleasant in the remembrance, and that when we separate it may be with a renewed and a united determination to put forth effort as never before in the interests of the college and for its highest prosperity.

HISTORICAL ADDRESS

By Hon. LYNDON OAK.

The statesmen of the revolutionary period, who formulated the self-evident truths upon which our government is based, and framed the constitution which has been the bulwark of the nation's liberties through the perils of a hundred years, had been educated in the colleges and universities of that time. But the men who laid the foundations of our present material prosperity and power had not been favored with corresponding educational advantages. Inventions evolved from the brains of unlettered men have been among the most potent factors of the nation's wonderful growth. Among the subjects that engrossed the attention of the inventors of that period was steam—its properties, adaptations and possibilities as an agency for moving machinery. An enthusiastic writer has said, that the birth of the republic and that of the steam engine were contemporaneous events.

The first condensing engine built in this country was constructed by John Fitch, a native of Connecticut, in 1787, by the assistance of common blacksmiths. After perfecting his engine, and experimenting with it, he used it through the season of 1790, to propel a boat on the Delaware river, where he made two thousand miles at an average speed of seven and one-half miles per hour. This successful experiment by Mr. Fitch who had been favored with only the slightest opportunities for education, made him the world's pioneer in steam navigation. But, having been broken down and reduced to penury by protracted, but unappreciated and unrequited service for the public good, Mr. Fitch was obliged to abandon long-cherished plans for bringing his invention into practical use. This he did with the prediction, inspired by success already attained, that some more potent man would get fame and fortune from his invention, and that the time would come when large rivers would be navigated by steam, and ships of war and packet-ships would be propelled across the Atlantic by the same agency.

The "more potent man" seen by John Fitch in his visions of the future, soon appeared in the person of Robert Fulton, who by the force of genius, energy and enterprise, aided by his influence with men of wealth and with legislative bodies, transferred steam navigation from the stage of experiment to that of a successful agency to promote the convenience and welfare of the growing republic. Fulton's early education was such as could be attained in the common school. After having acquired considerable reputation as an artist and inventor, he sought, in Paris, the scientific training which, coupled with a high type of genius, has given him immortality of fame.

Early in the present century, Oliver Evans, a native of Delaware, having previously invented the steam engine on the *high pressure principle*, demonstrated that it could be used successfully for the propulsion of land carriages. He thus placed himself in the same relation to our present system of railroad transportation, that John Fitch had done, in his own case, a few years earlier, to water navigation. Mr. Evans predicted that the time would come when transportation would be carried on over land, on railways of wood or iron, by the agency of steam. Mr. Evans' early opportunities for education had been of a limited character.

In the year 1812, John Stevens, a noted New York inventor, published a pamphlet in which he described the future railroad, including road-ways, locomotives, carriages and attainable speed with such surprising accuracy of detail, that it seems more like the description of an accomplished fact, than the prediction of a possible future achievement.

If, in the early days of the republic, the opportunities for scientific and practical education had been equal to those afforded for training men for the learned professions, the advent of the steamboat and rail-car would have occurred at an earlier date. It was the recognition of the importance of such opportunities that led, in after years, to the establishment of scientific schools. The first school of a high grade, in which classical gave place to scientific instruction, was the

Military Academy at West Point. This school, was, however, established for a specific and exceptional purpose.

One of the earliest attempts to provide for scientific and practical education was made in our own State in 1822, by the establishment of the Gardiner Lyceum at Gardiner. The design of this institution may be inferred by an extract from the petition of Hon. R. L. Gardiner and others to the legislature for an act of incorporation, which represented "that while the State has liberally fostered her colleges for the education of young men for the liberal professions, and possesses numerous academies for preparing youth for entering these colleges, and for making useful school-masters, she has, hitherto, omitted to make provision for giving instruction to her seamen, her mechanics and her farmers, upon whom her wealth and prosperty mainly depend." Dr. Ezekiel Holmes, who was afterwards so prominently connected with the industrial interests of the State, was, for a time, president of this institution.

For some time the lyceum received considerable patronage, and was aided by the State to the extent of $1000 per annum. At length, the State withheld its aid, and the institution was suspended for lack of adequate support.

Conspicuous among the scientific schools were the Rensselaer Polytechnic Institute at Troy, N. Y., established in 1824, the Sheffield Scientific School, an adjunct of Yale College which had its beginning in 1846, the Lawrence Scientific School, in connection with Harvard University, established in 1847, and the Chandler Scientific School in connection with Dartmouth College, established in 1851. The scientific schools gave to the country new classes of *professional* men such as professional engineers, architects, chemists, geologists and botanists.

But earnest, practical educators demanded a system, the ideal of which combined the training of the *hand* with that of the intellect, and invested labor with an intelligence which rendered it more effective, and raised it to a rank of honor

and dignity commensurate with its value and usefulness in the world's economy, and which embraced the broader culture that gives men influence in social life and on the platform and in legislative and congressional deliberations.

In the year 1859 in response to numerous petitions, a bill to "promote the liberal and practical education of the industrial classes" was passed by both houses of Congress. It had been drawn with great care by an able and practical statesman, the Hon. Justin S. Morrell, a member of the House from Vermont. It proposed to give to the several States and Territories 20,000 acres of land for each of their senators and representatives in Congress for the purpose above indicated. The bill was vetoed by President Buchanan. In 1862, a similar bill was passed which gave 30,000 acres of land to the States and Territories for each of these members in both branches of Congress. This bill received the approval of Abraham Lincoln, July 2d, 1862.

Thus, from the arena of transactions of the gravest character, where questions involving the future of the Republic had been submitted to the "dread arbitrament of war," and while the shock of contending armies could still be felt, this new factor, invested with the highest legislative power of the nation, and bearing the approval of Abraham Lincoln, was projected among the educational systems of the country.

In the presence of the grave events of the time, this particular event was scarcely noted, or even known. It, therefore, created no alarm, provoked no criticism, and excited but little general interest. All these came later. Its originators called it the new education, because it proposed to extend to the industrial classes the advantages of a liberal as well as practical education, by new methods of instruction. The new education was not conceived in a spirit of hostility to existing systems. It did not propose to pull down from the top, but to build up from the bottom. Its friends claimed that it was a logical outgrowth of the Baconian system of philosophy, published more than two centuries earlier. The

idea of a *liberal* education had, for centuries, been closely associated with a critical and protracted study of the languages and literatures of nations that had long ceased to exist. Bacon defined education to be the cultivation of a legitimate familiarity betwixt the mind and things. This brief and comprehensive definition opens a large field for study and investigation. Embracing the whole realm of natural history, it includes, also, the study of institutions, governmental, educational, charitable, reformatory, etc., as well as of those agencies that have contributed to the phenomenal growth of the country within the last fifty years. The old system dealt largely with things of the dead past; the new proposed to deal with things of the living present.

Tracing certain events of national importance that occurred during the stormy period of the rebellion to their causes there is revealed a remarkable and significant coincidence of dates. The antagonistic forces that led to the war of the rebellion were the civilization that emanated from Massachusetts, and the system of slavery that originated in Virginia. These had beginnings in the historic year of 1620. Mr. Bacon's system of philosophy, which contained the germ of the new education, was given to the world in the same eventful year of 1620. These events, accepted as causes of events to come, were followed by the establishment of the new education, on a national basis, in 1862, constituting the first serious innovation upon the exclusiveness of the scholasticism of the colleges and universities, the emancipation of 4,000,000 slaves in 1863, and the final overthrow of the slave power in 1865.

The National Land-Grant act, by virtue of which the new education was established as a national system, became a law on the second day of July, 1862, by the signature of Abraham Lincoln. We may well believe that this act afforded Mr. Lincoln peculiar satisfaction. Great in everything that pertained to the welfare of humanity, he was great in his sympathy for the classes with which his earlier life was so closely associated. The first session of the legislature of Maine,

thereafter, was in the winter of 1863. The late Hon. Abner Coburn, whose name is so intimately and beneficently associated with the entire history of our college, was governor. In his opening message to the legislature, he called attention to the act with characteristic brevity, as follows: "There can be no doubt, I think, that vast benefits will flow from this act, and I have no hesitation in urging upon you the prompt acceptance of its terms and conditions." Now that the subject was before the legislature the question of acceptance was the first to confront its members. It was a new problem. The friends of existing colleges looked upon it suspiciously. The average legislator approached it warily. The State Board of Agriculture favored acceptance. The gift tendered the State was prospectively valuable, and must not be lost by default. The legislature voted to accept the act. This was an important step, because such acceptance pledged the State to the support of at least one college to "promote the liberal and practical education of the industrial classes." A resolve was passed providing for the appointment of thirteen "regents" to devise measures for carrying out the purposes of the Land-Grant act, and a joint convention of the two branches of the legislature assembled to appoint the regents. The convention appointed a committee of one from each county to designate suitable persons for the regency, and adjourned to meet on the following day. It met in pursuance of the adjournment, but failed to accomplish the purpose of the meeting. Another incident of the session of 1863 was the proposition of Waterville College that the national donation of lands should be transferred to that institution, which, in consideration of the transfer, was ready to stipulate that two additional professorships should be established, and a specified number of students should be instructed in applied chemistry, civil engineering, and other branches of learning more or less closely connected with agriculture, without charge for tuition. This proposition did not meet with favor.

At the opening of the legislative session of 1864, Governor Cony gave his views upon the scope and importance of

the new educational scheme, as follows: "While among the sciences to be taught, it is declared that the leading object is to teach those relating to agriculture and the mechanic arts, the language of the act making the grant, declaring specifically that it is not its purpose to exclude other sciences, is pregnant with the conclusion that the design was to establish institutions of learning of the highest order; for its scope is as comprehensive as its whole design is liberal."

The legislature of 1864, like its predecessor, refrained from an exhibition of unseemly haste to grapple with the problems connected with the new college. A resolve was approved March 24th, near the close of the session, authorizing the Governor to dispose of the land-scrip granted by the National Government for the establishment of the college. It also passed a resolve approved March 25th, authorizing the Governor and Council to appoint three commissioners, whose duty it should be to memorialize Congress for an extension of the time during which the college may be established; also to receive donations and benefactions in aid of said college; also proposals for the location thereof; also to confer with States engaged in the same enterprise, and report thereon to the next legislature. The commissioners appointed by virtue of this resolve were Wm. G. Crosby, Joseph Eaton and Samuel F. Perley. They prepared a voluminous report, which was dated Dec. 19th, 1864. It came before the legislature early in the session of 1865, and was referred to the joint special committee on agriculture. It afforded the occasion for earnest and protracted discussion. The question of absorbing interest was, shall the institution be connected with an existing institution, or shall it be independent? It must have a habitation and a name. The name would come easily enough, but, if established on an independent basis, how could the funds required to construct the necessary buildings be obtained? The Land-Grant act forbade the use of any portion of the funds derived from the sale of lands, or the interest thereon, directly or indirectly, for the purchase,

erection, preservation or repair of any building or buildings. It was assumed that, in consideration of the extraordinary drafts upon the State treasury, necessitated by the war then in progress, aid from the State must not be expected, or even asked. There was no reckless haste to tender the necessary funds by individuals. In view of these adverse conditions, many of the friends of the college naturally looked to existing colleges for the solution of this difficult problem. Bowdoin and Waterville were ready, with elaborate propositions, to relieve the State of all embarassment in this matter.

Gov. Coburn had said in 1863, "It may be expedient, and indeed absolutely necessary, to allow some of our existing institutions to avail themselves of the benefit of the grant." Gov. Cony had said in 1864, "without the slightest preference as to what institution shall be selected with which to connect the agricultural college, my convictions are very decided that it is expedient to adopt some one of them." And now, in 1865, the commissioners came to the front with the recommendation to connect with Bowdoin College. On the other hand, the State Board of Agriculture, an organization of great influence, arrayed itself strongly in opposition to connection with *any* existing institution.

It had resolved in 1863, "that the college indicated by the act of Congress is essentially unlike either of the existing colleges in the State," * * * and that it "should not be incorporated with any of the existing institutions of the State."

The board maintained this position without wavering, through all the discussions that followed, and was supported by the leading agriculturists of the State. Its most powerful ally, however, was the *Maine Farmer*, which had a large circulation, and was edited by the veteran, Dr. Ezekiel Holmes, who bore a conspicuous part in the discussions that followed before the joint special committee on agriculture. Waterville College appeared before the committee in the person of its president, Dr. Champlin, with an elaborate proposition to establish a sort of educational circuit, to carry

out the purposes of which three professorships were to be established—at Bowdoin, a professorship of chemistry applied to agriculture and the arts, at Waterville, a professorship of engineering, or of mathematics applied to the mechanic and other practical arts, and at Bates, a professorship of agricultural zoology and veterinary science, including the anatomy, physiology and pathology of animals. The funds realized by the sale of the lands were to be held by the State, and twenty-five per cent of the income was to be devoted to the support of each professorship. The remaining twenty-five per cent was to be expended partly to pay cost of experiments and partly to pay for lectures to be given alternately at the three colleges. Such is a brief abstract of the Waterville plan.

Bowdoin's plan was presented by its learned and venerable president, Dr. Leonard Woods. Briefly stated, it proposed that the lands granted by the national government should be transferred and assigned in trust to Bowdoin College, that the college should establish an institution separate and distinct from all others—that it should put the institution in operation within the time limited by the act of Congress, and should perform, without expense to the State, *all the obligations assumed by it, in accepting said grant.* It was to supply all necessary instruction, provide the necessary philosophical and chemical apparatus, cabinets of specimens in geology, botany, mineralogy, and comparative anatomy, and to allow the students the use of the apparatus and collections already belonging to the college, and, under certain conditions, the use of the public libraries of the college. It proposed to provide a building equal in style and similar in plan to the Maine Medical College, land for an experimental farm and botanical gardens, a gymnasium, and a campus for military drill. Such, in substance, was Bowdoin's proposition. In face of the dubious prospects of obtaining funds for the construction of buildings and for other purposes, should the college be established on an independent basis, the proposition was a very tempting one. But it contained objectionable features, one of which was the inadequate conception of the main purpose

of the Land-Grant act, which was to "promote the liberal and practical education of the industrial classes." Bowdoin employs four years in giving to its students a *liberal* education. In dealing with the students of the prospective college, it proposed to compress all that is implied in the idea of a *liberal and practical education* into the brief space of a single year's training, and then to arm the boys with a certificate of proficiency, and turn them out upon the world. There was a suggestion of sarcasm in the remark of one of Bowdoin's most eminent professors, when he said that he did not approve connecting the college with any existing institution, but, if the State had determined to bury it, Bowdoin could give it a more *decent* burial than any other institution in the State. The State was not yet ready, however, to consign it to the hands of undertakers.

The friends of independency were ably represented before the committee. The sentiment of the board of agriculture had been decidedly adverse to a connection with any existing institution from first to last, and this sentiment had great weight in the final decision. Conspicuous among those who favored an independent institution, were the able Secretary of the Board of Agriculture, Hon. S. L. Goodale, Hon. Phineas Barnes and Dr. Ezekiel Holmes, editor of the *Maine Farmer*. Dr. Holmes maintained, with great earnestness, that in order to fill in any reasonable degree the measure of usefulness of which it was capable, the institution must be absolutely unhampered by any connection with any existing institution, "a tub on its own bottom." In one of his speeches before the committee, he exclaimed, that "the farmers of Maine, after having desired this thing so long, and hoped for it so long, and prayed for it so long, and waited for it so long, were not now going to sell their birthright for a mess of pottage." At the close of the last of the several hearings, the committee voted to report in favor of establishing an independent institution. A bill for its organization had been

carefully and ably prepared by Hon. Phineas Barnes of Portland, which was also reported.

It is but simple justice to say that the college had no abler or more influential friend than Mr. Barnes. In a series of articles communicated to the *Maine Farmer*, and afterwards published in the report of the Secretary of the Board of Agriculture, the subject of industrial education in its various phrases was discussed by him with an ability that attracted marked attention from the friends of the institution. When the report of the committee reached the legislature, a recess of half an hour was taken by both branches to enable each county delegation to select a suitable person to represent its county in the board of trustees. The persons selected were Samuel F. Perley, N. T. Hill, Bradford Cummings, Thomas S. Lang, Dennis Moore, Wm. D. Dana, S. L. Goodale, Robert Martin, Alfred S. Perkins, Joseph Farwell, Seward Dill, Joseph Day, Ebenezer Knowlton, Hannibal Hamlin, Chas. A. Everett and Wm. Wirt Virgin. These names were inserted in the first section of the Organic Act, and the bill passed both branches in due course, and received the approval of Gov. Cony. The first meeting of the trustees was held at the State House in Augusta, on the 25th of April, 1865, and the board was organized by the choice of S. L. Goodale, clerk. The Organic Act was adopted; Hannibal Hamlin was chosen president of the board, and Phineas Barnes, treasurer.

The limited time assigned me forbids a history in detail of the proceedings of this board of trustees. It entered upon the discharge of its duties under conditions of the most discouraging character. The State had placed no funds at its disposal for the construction of buildings and other necessary purposes. It made an earnest appeal to the public for contributions, but the public did not respond. It had another problem of great difficulty and delicacy to deal with, that of location. With reference to this it examined lands at Togus and Topsham, the Taylor farm at Fairfield, the Nourse farm at Orrington, and the White and Frost farms at Orono.

The western members had a very decided preference for Topsham. At a meeting of the board held at Augusta, September 14, 1865, a motion to locate the college at Topsham was lost by a vote of six to five. At a meeting at Augusta, January 25, 1866, the board voted to locate at Orono, the vote standing eight in favor and seven in opposition. (The members voting in favor were Messrs. Hamlin, Hill, Cummings, Moore, Farwell, Day, Woodman and Everett, and those against were Messrs. Perley, Dillingham, Goodale, Martin, Perkins, Dill and Virgin). The location decided on was largely due to the personal exertions of Hon. Wm. P. Wingate, afterwards a trustee of the institution. This result was a fatal blow to the harmony of the board. Some of its most prominent members believed that Topsham presented a broad range of advantages of great value, many of which the farm at Orono lacked. From the day the location was decided in favor of the latter place, the cohesion of the membership of the board weakened, and its disintegration began. At its last meeting held at Augusta, January 29, 1867, the following petition was signed by all the members present, ten in number:

"The undersigned, Trustees of the State College of Agriculture and the Mechanic Arts, respectfully represent that, in their opinion, the number of the members of the board should be less than it now is, and ask that the number be reduced to not less than five nor more than seven. They would suggest that the new board of trustees be appointed by the governor and council, and with regard to fitness rather than locality. They also indicate their readiness to retire from the position now held by them for the purpose above indicated." The petition was promptly responded to by the legislature, and a bill embodying its requests was passed. (The last act of the retiring board was to elect the Hon. Phineas Barnes, president, and vote him a salary of three thousand dollars per annum.)

The original board of trustees having retired, a new chapter of incidents and accidents, of successes and reverses, opened

in the history of the inchoate institution. It required several years to determine whether the struggle would terminate in success, further postponement or irretrievable disaster. The Organic Act had been amended so as to reduce the number of trustees to seven, to be appointed by the governor, subject to the approval of the executive council. The struggle commenced in the effort to find the required number of men capable of dealing with problems new in character and difficult of solution, whose services were, at the same time, available. If Gov. Chamberlain made serious mistakes in making his selections, he was ready when the occasion came to explain them. The explanation will be noticed farther on. The names of the new board were announced in April, 1867, and were as follows: S. F. Dike, Abner Coburn, Lyndon Oak, Isaiah Stetson, Wm. P. Wingate, Geo. P. Sewall and Nathaniel Wilson, five of the number residents of Penobscot county. In these appointments, two of the recommendations of the retiring board had been complied with. The membership had been reduced to seven, and the appointments made with reference to convenience of locality. In respect to the third condition, that of fitness, I am sorry to say the popular belief was, that the governor had hit wide of the mark. The leading agricultural paper of the State which had a large circulation and numerous readers, indulged in some very sharp criticisms of the appointments, which increased the embarrassments of the new board. Nevertheless, its members had the temerity to assemble and organize. The organization was effected at Bangor, April 24, 1867, by the choice of Abner Coburn, president, S. L. Goodale, clerk, and Isaiah Stetson, treasurer. That the trustees sought the services of a clerk outside of their own number, was due to their earnest desire to avail themselves of the valuable counsels of the man who had given the new educational scheme much careful thought and earnest study, and whose ideal of its possibilities was very high. In his report of 1863, as secretary of the board of agriculture, he expressed the following views: "It

is rare that any subject of greater magnitude calls for legislative deliberation. Upon the action which this receives, depends in large measure, not only the extent and degree to which agricultural knowledge shall be disseminated among the farmers of the State, but also the degree of progress which shall be made in all the arts of life; the future development of our untold natural resources; in a word, the productiveness of our whole domain, and its position and power as a State. Only questions pertaining to the existence, integrity, and honor of our common country, take higher rank. May infinite wisdom guide deliberations to the best possible results." It was an occasion for regret to the trustees that Mr. Goodale declined the position tendered him.

The new board of trustees entered upon its duties under numerous and serious disadvantages—a majority of its members had given the new educational scheme but little thought or study; when they came together the first time, they came as entire strangers to the views of each other in relation to the matter in hand; there was but little in the experience of the past to guide them; the results sought were far different from those attained by existing institutions, and could be reached only by different methods; there were no models for imitation, institutions in other States having an origin in common with our own, were, like ours, groping in the dark. On the other hand, there were favoring circumstances—the difficult and vexatious question of location had been settled; the board of trustees had been reduced to a small and compact body; the theory that the money needed for the construction of buildings and for ordinary current expenses could be raised by subscription had been exploded, and the State had placed $20,000 at the disposal of the new board.

The trustees made their first visit to the site of the institution, May 16th, 1867, where they found two sets of farm buildings much out of repair. These were repaired and made useful—one for the first professor, the other as a temporary residence for the farm superintendent. But the first impor-

tant question that confronted the board was, what shall be the character of the new buildings? There was a sort of vague theory somewhat prevalent, that a system of education differing so radically from existing systems, must be provided with buildings and appointments entirely unique in character. To *some* of the eminent friends of the college, the mention of bricks and mortar, though only in relation to a smoke flue, was painfully suggestive of the monasticism of the middle ages. To construct dormitories would be to fall into "ruts" made deep by the wear of centuries. In obedience to the sentiment that the buildings, in structure, size and equipment must be unique in character, one of the leading minds of the original board of trustees had invoked the professional aid of the distinguished landscape artist, Fred Law Olmsted of New York, to determine "the location, number, style and internal arrangement of the contemplated buildings," * * * and "to construct a complete and exhaustive ground plan of arrangements." Another professional artist had been employed to make a topographical map of the farm. The report of Mr. Olmsted and the topographical map were among the inheritances of the new board. The report was able and elaborate. It contained valuable suggestions of which the board was glad to avail itself. But it proposed to establish the college on an essentially military basis. At a remove of only two years from the close of the war, Mr. Olmsted's plan met with considerable favor, but the trustees believed that with the subsidence of the military spirit, the mode of life prescribed by this plan would become irksome, and finally impracticable.

In the absence of boarding houses within convenient distance of the college site, it was decided to construct a wooden building whose roof should cover eighteen rooms of suitable size and finish for students. Wingate Hall, with its spacious rooms, was constructed in pursuance of this decision, and although not completed until the following year, it was ready for occupation as soon as needed. Several of its ample rooms have since proved very useful as class rooms.

During the year 1867, there was considerable discussion in the board upon the policy that should be pursued in the construction of buildings as they would be needed, one after another. There was a sentiment, more or less prevalent, that inexpensive wooden buildings should be provided at first, to be followed by more substantial structures later, when the college could better afford the expense. The policy determined on, however, was to construct thoroughly, and of durable material, so far as the work of construction was carried. Preparations were made during the season to manufacture bricks on the college farm for the next building needed.

The year 1868 did not open auspiciously upon the fortunes of the struggling institution. Ominous clouds threatened its future. Adverse criticism had been freely indulged in by those who had exhibited, in previous years, much interest in the new educational movement. Governor Chamberlain had evidently been much affected by the volume of such criticism. His allusion to the college, in his message at the opening of the legislative session, was apologetic and deprecatory in tone, and was not in the highest degree complimentary to the board of trustees of his own appointment. He said: "In reconstructing the board of trustees, in accordance with the act providing for the same, it was found difficult to induce gentlemen most naturally suggested, to accept the position." In their report to the legislature, the trustees asked for $20.-000 to build a chemical laboratory and for current running expenses. In answer to this, the Governor recommended the expenditure of the balance of the previous year's appropriation on a cheaper building, and warned against "errors which have well-nigh ruined similar institutions in other States."

The annual session of the board of agriculture opened soon after. That body had, from the first, exhibited great friendship for the college, and was still relied on for influential support. The management of the trustees came up early—

not, however, for friendly consideration, but sarcastic criticism. The report of Ex-Governor Coburn, as president of the board, was a concise and accurate statement of the progress that had actually been made, and a presentation of the immediate wants of the college. This report was severely criticised, both for sins of omission and commission. It omitted the discussion of the profound problems involved in the new educational scheme. The Ex-Governor was not in the habit of dealing in "sounding manifestoes," but if the college had occasion to borrow $10,000 to meet a pressing exigency, he would give his name to a note for that amount with as much apparent indifference as in ordering steak for breakfast, and his promise to pay would always bring the money without regard to the amount. But the word "dormitory" unfortunately slipped into the report, and that obnoxious term was not often found "except in connection with a scholastic college or a convent, or something else of monastic origin." The fear was that the new institution was to be run in old grooves. But, to anticipate a little:—the board of agriculture took the initiative a year later, in measures to bring the two institutions into harmonious working relations, and it has maintained a spirit of friendly co-operation from that time to the present. It may be safe to assume that the temporary hostility of the board was due mainly to the keen disappointment that followed the location of the college at Orono, instead of Topsham.

In face of the adverse influences that assailed the college at the opening of the legislative session of 1868, the prospect of a favorable response to the application for an appropriation of $20,000 was not inspiring. The legislative committee gave the trustees several hearings, and finally recommended the appropriation asked, but the legislature at first seemed likely to turn the college away with nothing. But it had earnest friends in both branches; conspicuous among them was Hon. A. M. Robinson of Dover, of the House, who did effective work for the institution. An appropriation of $10,-

000 was finally granted. Having prepared a home for a limited number of students the preceding year, the next object of attention was the construction of a chemical laboratory.

It was generally conceded that thorough training in chemistry should be a prominent feature of the college, on account of its close relations to agriculture and the manufacturing interests of the country.

The first question to be determined was what shall be the number and size of its rooms, and extent of its equipments? It was an important problem, and had been the occasion of considerable anxiety. There is an old proverb that "Providence will help those that are trying to help themselves," and in this case it was verified in a double sense. The city of Providence, R. I., could furnish just the model needed. Four years earlier, Brown University, located in the city mentioned, had built and equipped a laboratory combining the best features of both European and American laboratories, and it was believed to be the most completely equipped institution of the kind in the United States. Columbia, Yale and Amherst colleges and the Polytechnic Institute of Troy, N. Y., had copied it. It was just what Maine needed, and the trustees decided that Maine should have it. Four years' experience at Providence had suggested some minor improvements. These were adopted and incorporated in the plans of our laboratory, which were prepared by the same accomplished architect, A. C. Morse, Esq., of Providence, who had prepared the plans of the building copied.

And now another important problem presented itself. The trustees had decided to receive students in the coming autumn, and provide for their instruction. But, instructors, they were to come from where? A voice from the mystic realm of echo mockingly answered, "from where?" The colleges and universities had trained men in large numbers for the learned professions. But men whose training and inclinations fitted them for work in the new educational scheme were very scarce. A brief subsequent experience forced the trustees

to the conclusion that our own institution must ultimately furnish its own instructors, and an investigation of its departments to-day will show whether this reliance was safe. With three or four exceptions, from the executive down, the departments of the college are filled by men who have been trained for the positions they occupy by our own institution. But it will be said that our able and excellent president was graduated from Bowdoin.

Samuel Finlay Breese Morse, who gave to the world that wonderful invention, the magnetic telegraph, was a graduate of Yale, and as such, was undoubtedly well fitted for a learned profession, but the knowledge that made him an inventor twenty-five years later was picked up, as Herbert Spencer would say, "in nooks and corners."

Our president was graduated at Bowdoin, but the training that has placed him in the front rank of the practical educators of the country, is the result of earnest and successful work upon new problems through a period of twenty years, at the institution with which he has been so prominently connected. President Fernald was appointed Professor of Mathematics July 2d, 1868, and entered upon service for the college July 15th. His first work was to arrange the outline of instruction in harmony with the purposes of the college, for a course of four years. To this end, he visited institutions in other States, established a little earlier than ours, for the purpose of acquiring familiarity with their methods. The first class of twelve students entered the institution September 21, 1868.

The year 1869, like that which preceded it, was characterized by frowns and smiles, but in reversed order. Allusion has been made to the temporary hostility of the board of agriculture. Early in its session of 1869, it extended a cordial invitation to two of the trustees of the college, one a member of the Senate, the other of the House, to a conference for the purpose of devising measures to promote harmony of action between the two boards. It had been

the policy of the trustees not only to give no occasion for antagonisms, but to refrain from perpetuating those already existing. They, therefore, accepted the invitation without hesitation. As the result, a bill was prepared, the important feature of which was to constitute the secretary of the board of agriculture a trustee of the college *ex-officio*. The bill became a law, and thus the ripe experience and valuable councils of Hon. S. L. Goodale were brought to the aid of the college. He was followed by Hon. Samuel L. Boardman, who has also been a valuable friend to the institution. The present able, enthusiastic and indefatigable secretary of the board of agriculture, Hon. Z. A. Gilbert, is now a trustee of the college by virtue of the same act. The legislature also exhibited more friendliness to the college, and passed a resolve appropriating $28,000 for its benefit. The resolve, however, contained a provision that was distasteful to Orono. The conveyance of the college farm by the town to the State, contained the provision that in case the property should be diverted to any use other than that intended by such conveyance, it should revert to the town, and such reversion would carry with it all the buildings that might have been constructed, and all improvements made in the meantime. This feature of the conveyance was not satisfactory to the State. Coupled with the resolve making the appropriation, was the condition "that in case the location of said college shall be changed from Orono, or be abandoned, or cease to be used for the purposes contemplated by the act establishing said college, then in such an event, the State shall refund to the inhabitants of Orono the sum originally paid for said lands, viz., $11,000." The town rejected this overture of the State by a very decisive majority. This action was the result mainly of a belief of its citizens that there was a design to effect the discontinuance of the college at Orono, and have it established at some other place. It had the effect to postpone the work of construction for a whole year. The impatience of the friends of the college,

engendered by this unnecessary delay was much more likely to result in a change of location than a prompt acceptance of the condition imposed by the State would have been. The trustees were surprised and disappointed by this action of the town, but subsequent friendliness and loyalty of its citizens to the college soon dissipated all feelings of resentment.

The year 1870 was more fruitful of results than had been any previous year. The legislature re-appropriated the $28,000 that the college had not been able to realize the preceding year, and added thereto $22,000. The legislature, in making the appropriation, imposed substantially the same condition relating to the deed of conveyance of the lands that had been rejected in 1869. This condition was now, however, accepted by the town, and thus the sum of $50,000 was placed at the disposal of the trustees. The work of the year, briefly described, was the thorough drainage of the land that constitutes the building sites and the slope in front, the manufacture of 500,000 bricks upon the college grounds for building purposes, the completion and equipment of the chemical laboratory, the building of a boarding-house to accommodate one hundred students, the construction of Oak Hall except the inside finish, the clearing and grading of grounds, and the construction of the carriage-way that passes the main college buildings. The work of the year had settled one question that had been a disturbing element. It was, that the college had been located at Orono to stay.

In 1871, the buildings that had been left incomplete the previous year, were finished and made ready for use. The boarding-house was opened and placed in charge of Rev. A. W. Reed. Students had previously boarded in the family of the farm superintendent.

From the opening of the college in 1868, M. C. Fernald, A. M., a graduate of Bowdoin College, had been Professor of Mathematics, and Samuel Johnson, A. M., also a graduate of Bowdoin, Instructor in Farm Practice. At the commencement of the college year of 1869, Stephen F. Peckham, A.

M., a graduate of Brown University, entered upon service as Professor of Chemistry, and a little later, Mr. John Swift a graduate of the Michigan Agricultural College, as Instructor in Botany and Horticulture.

In 1870, the list of instructors was as follows: Merritt C. Fernald, A. M., Acting President and Professor of Mathematics and Physics. Samuel Johnson, A. M., Farm Superintendent and Instructor in Agriculture; Stephen F. Peckham, A. M., Professor in Chemistry; John Swift, B. S., Instructor in Botany and Horticulture; Mrs. Mary L. Fernald, Instructor in French and German; C. B., Lakin, Instructor in Book-Keeping and Capt. Henry M. Sellers, Military Instructor.

In 1871, four full courses of study were arranged—a course in Agriculture, in Civil Engineering, in Mechancial Engineering and an Elective Course.

The board of instruction, was re-organized and enlarged. Prof. Peckham and Mr. John Swift resigned their positions in the board of instruction, on account of differences of opinion between themselves and the trustees regarding the proper management of the affairs of the institution. Mr. Johnson, also, resigned his place as farm superintendent, and was succeeded by Mr. J. R. Farrington of Brewer.

Prof. M. C. Fernald, who had been acting president from the opening of the institution, desiring to be relieved from its executive duties, the Rev. Charles F. Allen, A. M., a graduate of Bowdon, was elected president of the college, Aug. 2d, 1871, and on Aug. 31st, delivered his inaugural address in the presenee of a large and interested audience, and entered, at once, upon the discharge of his official duties.

The personnel of the board of instruction, as re-organized, was as follows: Rev. Chas. F. Allen, A. M., President and Professor of English Literature and Mental and Moral Science; Merritt C. Fernald, A. M., Professor of Mathematics and Physics; Robert L. Packard, A. M., Professor of Chemistry, French and German; Wm. A. Pike, C. E., Pro-

fessor of Civil Engineering; Chas. H. Fernald, A. M., Professor of Natural History; Joseph R. Farrington, Farm Superintendent; James Deane, Military Instructor; John Perley, Instructor in Book-Keeping.

The radical changes of 1871 were followed in 1872, by results of a very encouraging nature. The disturbing influences that had been so fruitful of evil had given place to those of a more healthful character. The increased force of instructors, the presence of four classes where there had previously been but three, and the popularity of President Allen had the effect to increase the number of students from forty-two to seventy-one. The graduation of the first class of six students occurred this year. A commodious house for the family of the president was built. The Coburn Cadets were organized in two companies and procured uniforms. The first lady student was admitted to the college in 1872, in the person of Miss Louise Hammond Ramsdell of Atkinson.

At the opening of the college year of 1873, the number of students, including four ladies, was one hundred and three against seventy-one the previous year. During this year a large and very convenient barn and the dwelling house now occupied by Prof. Aubert were built. Mr. Geo. H. Hamlin, C. E., a graduate of the college, was appointed assistant professor in the department of civil engineering.

The plan of self-government was adopted by the students upon the recommendation of the faculty and was followed by gratifying success. A class of seven was graduated.

The catalogue of 1874 exhibits a list of one hundred and twenty-one students, representing every county in the State. The graduation of the first lady student occurred this year, of whom President Allen said "she sustained a rank equal to any in her class, and during her whole college course, she never missed a recitation or any exercise on account of her health."

Lieut. W. S. Chaplin, a graduate of West Point, was elected Professor of Modern Languages and Mechanics and

Military Instructor. This appointment was followed by a largely increased interest in the military department. The graduating class numbered six. The trustees indicated their policy with respect to stocking the farm by introducing several animals each, of Shorthorn, Jersey and Ayrshire thoroughbreds.

While in the year 1875, the aggregate of students (115) was a little less than in the preceding year, the freshman class, numbering thirty-five, was larger than ever before. The number graduated was nineteen. In 1876 it was decided to reduce the number of college terms from three to two.

The trustees had, from the time of opening the institution, earnestly desired to introduce a system of shop-instruction and practice, primarily for the benefit of students in the department of mechanical engineering; but such provision would involve an expenditure for suitable buildings, machinery and tools, which they could not hope to meet for many years to come. But in 1876, an avenue to the realization of this desire was suddenly and unexpectedly opened. At the Centennial Exposition held at Philadelphia during that memorable year, the Russian government made an exhibit of the Russian system of shop-work instruction and practice. The features of this system which commended it to practical educators were its simplicity, comparative inexpensiveness and wonderful adaptation to the ends desired. Under the lead of President Runkle of the Boston School of Technology, that institution adopted it in the autumn of 1876, and put it in practice without delay. By recommendation of Prof. W. A. Pike, himself a graduate of the institution just named, the trustees of the State college voted to adopt it.

The Boston School of Technology was the first public institution in this country to adopt the system and our own State college was the second. To-day it is finding great favor with practical educators throughout the country.

The number of students in 1876 was 91—of graduates, 18.

In 1877, a commodious farm house was built. The number of students was 118—of graduates, 16.

In 1878 the catalogue showed the presence of 101 students. Twelve students were graduated. The lessened number was attributed to the straightened condition of financial affairs.

It will be remembered that the Russian system of shop-instruction and practice had been adopted in 1876. But, although the legislature had been petitioned for money to build and equip the shops necessary to carry such instruction into practical use two years in succession, that body had not given a favorable response. The importance of hastening preparations was forced upon the attention of the officers of the college in an emphatic and unexpected manner. At the opening of the spring term, 1878, the students of the class in mechanical engineering, having become impressed with the importance to themselves of an opportunity for shop-instruction and practice, courteously informed Prof. Pike of that department, that unless supplied with such opportunity at the institution of their choice, they should feel compelled to seek it elsewhere. The effect of the loss of a promising class for such a reason, would not improve the morale of the institution. The officers of the college and the students immediately interested, subscribed to a fund to be used for providing necessary equipments. This, supplemented by $250 from the hand of Ex-Governor Coburn, always the source of final resort in such cases, sufficed to inaugurate the *Russian System of Shop-Instruction* on a very humble scale.

A small room—the only available one—in a remote part of the chemical laboratory, was assigned to the class, whose members performed all the mechanical labor necessary to put it in readiness for use, including the making of the benches. A competent instructor from the Boston School of Technology was employed, and a course in vise-work was begun.

The time employed to complete the course was 12 1–10 days of actual labor—or three hours per day, five days in the week for half a term. It is interesting to notice results. The course consisted of 22 pieces of work. The rank of the work was denoted by numbers. The highest attainable

number was 100. The highest rank actually attained in the possible 100 was 97.76 per cent, while the average of the entire class was 93.7 per cent. This work was exhibited at the State fair in Portland, where a medal was awarded for its excellence, and skilled mechanics bestowed high commendations upon it.

The editor of one of the leading papers of that city said of it: "The vise-work showed the skill of trained artisans in the direction of the manufacture of complicated machinery." At the commencement of the fall term it was desired to provide for a course of instruction in forge-work, but the little room in the attic could not be made to do service where heavy sledges, wielded by sinewy arms, were an element in the course. There was no available shop on the college campus. At the request of the students, they were allowed to use a pile of lumber that had been drawn to the spot for another purpose, and were furnished with the nails and glass needed. These materials soon assumed the form of a building 41x21 feet where a course in shop-work was duly inaugurated, the work of construction having been performed entirely by the students.

The results of the course were substantially a repetition of those of the preceding course. The achievements of the class in mechanical engineering which have been described, indicate that the training at the State college, sometimes, *takes quite a practical turn.*

The catalogue for 1879, registered 102 students. The number graduated was 21. This year was characterized by radical changes of a personal character. Hon. Isaiah Stetson resigned his position as treasurer of the institution, and was succeeded by Col. Eben Webster of Orono. Hon. Abner Coburn, Rev. Samuel F. Dike and Hon. Samuel L. Boardman retired from the board of trustees, and their places were filled by Hon. Luther I. Moore of Limerick; Hon. Emery O. Bean, of Readfield, and Hon. S. L. Goodale, of Saco. The place in the board of Hon. James C. Madigan of Houlton,

was rendered vacant by his death, and filled by the appointment of Hon. A. M. Robinson, of Dover.

Rev. Dr. Charles F. Allen resigned the presidency of the college on the first of January, 1879 in obedience to a purpose of returning to his vocation as minister in the denomination with which he is connected—formed at the time of his acceptance of the presidency of the institution. Prof. M. C. Fernald was elected to fill the vacancy thus made.

Mr. J. R. Farrington resigned his place in the board of instruction, and was followed by W. H. Jordan, B. S., a graduate of the State College. Mr. Allen E. Rogers, A. M., a graduate of Bowdoin College was appointed instructor in the department of Modern Language and Military Science. His predecessor, Professor Francis L. Hills, retired from the college to enter upon the service of the United States Government at Charleston, S. C.

The number of students registered in 1880 is 104; the number of graduates 15. Previous to this year the departments of civil and mechanical engineering had been under the charge of Prof. W. A. Pike. Upon his retirement from the college to accept service elsewhere, these departments were separated. The department of civil engineering was assigned to Prof. George H. Hamlin and that of mechanical engineering to Prof. Charles H. Benjamin, both former students at the State College.

The regular current of affairs at the college was somewhat disturbed this year (1880) by the report of a legislative committee which had visited the institution. The committee objected to the breadth of the course of study laid out by the trustees, and, after indicating *their own views* of the value of the results obtained, recommended a reduction of the time employed from four to three years, and the limiting of "instruction to branches of study more nearly related to agriculture and the mechanic arts." The higher culture which comes from literary and classical training, should be excluded, because it could be obtained elsewhere without expense to the

State. The legislature, by a decisive vote, indicated its disposition to leave the whole matter of instruction with the officers of the college.

The catalogue of 1881 registered 90 students. The number of graduates was 25. Up to 1881, there had been no charge for tuition. The legislature of 1879 had provided by enactment that "a reasonable charge shall be made for tuition, the amount of which shall be determined from time to time, by the trustees." Thirty dollars per annum has since been charged for tuition.

The number of students registered in 1882 was 82—of graduates, 24. It was believed that the charge for tuition had the effect to deter individuals from registering as students who might otherwise have done so.

The first assignment to the college of a military instructor by the United States government, occurred in 1882, when Lieut. Edgar W. Howe was ordered to report for duty at the institution as instructor in Military Science and Practice. The government has provided for such instruction from that time to the present.

The number of students registered in 1883 was 76—of graduates, 13. A commodious and substantial wooden building was constructed, partitioned into compartments, and equipped for the several courses in shopwork instruction and practice. Two courses, one in vise-work and one in forge-work, had been instituted five years earlier, but for want of means no step had been taken in advance. The new building afforded the facilities for an onward movement and the first step was provision for a course in carpentry, which was soon followed by a course in wood turning.

The number of students registered in 1884 was 91—of graduates 14. The reaction occasioned by the policy instituted by the State of requiring students to pay tuition, was in process of neutralization through the effect of favoring influences, and the number increased from year to year.

The catalogue of 1885 indicates the number of students to be 92—of graduates 16. The State Experiment Station was

established on the college farm during the year 1885, and, although its management was entirely independent of the college, the specific work it carried on was of direct and important advantage to the students in agriculture.

The number of students in 1886 was 103, of graduates 17. Prof. C. H. Fernald of the department of natural history, at the close of fifteen years of able and acceptable service, resigned his position to enter upon similar service at the Massachusetts Agricultural College.

The year 1886 marks the date of a severe financial misfortune to the college in the loss of a fine herd of thoroughbred cattle, mainly of the Jersey breed. This event gave rise to much speculation and discussion as to the cause or causes of a disease that created the occasion for destroying a herd of fifty cattle. Some maintained that it was the result of the feed they were supplied with; others, that it was the result of bad sanitary conditions such as the want of ventilation, etc. Dr. C. B. Michener, who was sent by the United States Commissioner of Agriculture to investigate the matter, and who made a thorough examination, being present at the slaughter of the cattle, made the following statements in his report to the governor of Maine, bearing upon the points that have been named:

"I was first led to examine the hygienic surroundings. The barn is a large one, and has ample room for the stock. It is well lighted and thoroughly ventilated, the air being surprisingly pure as I entered the building early in the morning. The stalls are kept very clean, as the cattle themselves show. * * * The feeding is judicious in every sense, and the food, both grain and hay, is of the best quality." * * *

"In answer to those who contend this disease was caused by improper feeding or lack of sufficient ventilation and exercise, it is only necessary to remind you that tuberculosis, like small pox and similar diseases, *is a specific malady, one that can only be spread by coming in contact in some way with its special and determined infecting agent.*"

Dr. Geo. H. Bailey, State Veterinary Surgeon, says in his report of 1887, "At the time of my first visit I found the buildings in which the cattle were contained among the best and most commodious I had ever visited, and that every provision for the maintenance of perfect health among its occupants had been fully and amply secured. An abundance of sunlight and pure water, scrupulous cleanliness, sufficient and wholesome nutrition, thorough drainage, and ventilation so perfect that the air was almost as pure inside the barn as out."

The disaster to the college herd is not an isolated case. The same disease attacked the herd of cattle belonging to the Willard Asylum at Willard, N. Y., two or three years earlier with even more disastrous results. A large herd belonging to one of the public institutions of Rhode Island met with a similar fate from the same cause.

The number of students registered in 1887 was 121, of gradutes, 20. The prominent feature in the work of exterior construction in 1887, was the building for the departments of natural history and agriculture, which, in its order, is the crowning feature of the college.

For a period of five years, from 1882 to 1887, the college farm under the skilful management of Mr. G. M. Gowell had been the theater of marked improvements. Fifty acres of land had been redeemed from a condition of almost utter unproductiveness and added to the productive acres of the farm. The crop of hay had been nearly doubled. Gratifying improvements were everywhere noticeable. A fine herd of cattle and other valuable stock had been collected and were becoming a source of revenue to the farm. The loss of the stock, which has been noted, brought this gratifying progress to a stand, and the march of improvement for want of the necessary means has not been resumed.

We are assembled here to-day under most encouraging conditions. The existence of the building we now occupy, and which we now dedicate to the service of scientific study and

investigation, is largely due to the intelligent comprehension of an urgent, special need of the institution by the legislative committee, a part of whose members we are glad to greet on this auspicious occasion. The presence of this fine building, with its admirable adaptations, will impart dignity, character and a large increase of usefulness to the institution.

A brief reference to the elements of a personal character involved in the early history of the college, may not be inappropriate. Allusion has been made to the severity of criticism so freely bestowed upon Gov. Chamberlain's appointments to the board of trustees. Perhaps no one of these was more sharply assailed than that of Ex-Gov. Coburn. And yet his connection with the college, as one of its trustees, was an element of eminent usefulness. The institution, during the first few years of its existence, was constantly threatened with strangulation by a relentless opposition. The presence, therefore, of a man in the board of trustees, who could carry it on his own shoulders, if the exigencies required, was an element of vital importance. Such a man was the Ex-Governor. His habits of observation, practical acquaintance with business affairs, and trained judgment, rendered his councils valuable in all matters pertaining to the location and construction of buildings. While he never made the slightest pretension to literary culture, he appreciated such culture in others, and no man in the board of trustees resisted every proposition to narrow the scope of instruction in the college, coming from whatever source, more promptly or tenaciously than he. His marvelous fidelity to the obligations of his trustee-ship was a powerful incentive to those associated with him, to put forth their best efforts to promote the welfare of the institution. Such fidelity will be appreciated when it is known that, with the vast business responsibilities constantly resting on him, he never allowed a business engagement to prevent his presence at the regular meetings of the trustees in more than one or two instances during his connection with the board, a period of twelve years. He attended,

all legislative hearings held in the interests of the college, where his proverbial integrity, sound judgment and well known business sagacity, gave him great influence. The sentiment, that it was safe to follow where the Ex-Governor led, found frequent expression in legislative committees. His eminent labors for, and frequent benefactions to the college, were never accompanied by any display of ostentation. The building whose roof covers us to-day bears indeed, his honored name, but had he been living, no word or sign of his would have suggested it. He might have given his name to the institution, of which this building is only a part, in consideration of his premeditated munificent bequest, but he repelled all suggestions of this kind. The record of his unselfish labors and noble benefactions will endure as long as the college endures. And to-day, assembled to celebrate a fresh triumph of the institution with which his name is so honorably associated, remembrances of these labors and gifts, blending harmoniously with remembrances of similar benefactions to other institutions, established to promote literary culture and mitigate human suffering, come to us like the harmony of some grand old anthem that uplifts men and makes the world better.

Among the prominent associates of Ex-Governor Coburn in the board of trustees, was Hon. William P. Wingate of Bangor. Mr. Wingate served in the board for a period of sixteen years; was its president four years, and chairman of the executive committee through his whole term of service. With a single exception, he was longer a member of the board than any other trustee. Mr. Wingate's presence in the board was, from first to last, an element of conspicuous usefulness. Another associate of Ex-Governor Coburn was the Hon. Nathaniel Wilson of Orono. Mr. Wilson's official relation to the institution, although brief, disclosed an intelligent comprehension of its purposes, and he has never faltered in his devotion to its welfare. As a member of the legislature he has had opportunity to perform signal service for the

college which he did not fail to improve. Among other trustees who were associated with Ex-Governor Coburn in these early days of discouragement and doubt, and who rendered valuable service to the institution, were Rev. Samuel F. Dike of Bath, and Messrs. S. L. Goodale of Saco, Samuel F. Perley of Naples, James C. Madigan of Houlton, and Thomas S. Lang of Vassalboro. It would be a pleasing task to recall the names of all who have served in the board for longer or shorter terms, if my limits would allow. The fidelity of their service may be inferred from the fact that during a period of twenty years, not more than three or four instances have occurred when a majority of the members were not present at the meetings of the board. And such fidelity is emphasized by the fact that the meetings were quite frequent in the earlier years of the college, that the trustees served without compensation, and that each attendance involved a loss of from two to five days' time to each member, depending upon his distance from the place of meeting. Through this long period of twenty years, the meetings of the board have been characterized by a remarkable degree of harmony.

There were two officers of the college whose names must not be forgotten—the Hon. Isaiah Stetson of Bangor, and Col. Eben Webster of Orono. Both were earnest, constant and valuable friends of the college, and both served it as treasurer without compensation, the former from April, 1867, to January, 1879, the latter from January, 1879, until the summer of 1883.

The Rev. Charles F. Allen was called to the presidency of the college in 1871. He was one of the very few educated men of that time who had manifested a generous friendship for the institution. President Allen brought to the service of the college, scholarship, experience, and faith in the institution, and the influence growing out of an acquaintance extending to almost every part of the State. One of his marked characteristics was his warm sympathy for the students of the institution, especially those who were struggling

to obtain an education against adverse circumstances. This sympathy always found expression in hearings before legislative committees, and in addresses of a more public character when the interests of the college were under consideration. His connection with the college was marked by conspicuous usefulness, and will always be one of its cherished memories.

Another personal element of the institution demands special recognition. President M. C. Fernald was its first instructor. He entered upon service for the institution, July 15th, 1868. Although a graduate of Bowdoin college, he did not not allow the traditions and methods of his Alma Mater to interfere with a faithful discharge of his duties to the new institution. Accepting the National and State acts that brought the institution into existence as his guide, he carefully studied their purposes, limitations, suggestions and scope. If he had predjudices against the new system, as most educated men had at that time, he held them in abeyance. If, under circumstances of the most discouraging character, he sometimes had doubts of ultimate success, he did not allow them to divert him from his purpose, or the expression of them to discourage the efforts of others. He has never been unduly elated by unexpected success, or greatly depressed by disheartening circumstances. Endowed with an unusual power of endurance and capacity for labor, he has devoted himself to the service of the college without regard to the usual limitations of time or strength. Always loyal to the institution, where his presence has been an inspiring, regulating and uplifting influence, he has repelled all offers of higher salaries by wealthier and more pretentious institutions. With the able co-operation of his associates, he has carried the institution to a high plane of usefulness, and has placed himself abreast with the most successful educators of the country. When we recall the severe, and oft recurring rebuffs of adverse forces, during the first three years of the history of the college, the question may be fairly raised, whether, with the elimination of Ex-Gov. Coburn

from the board of trustees, and of President Fernald from the board of instruction, the, institution would exist where it is, or as it is, or would have an existence anywhere as an independent institution.

In the work of raising the instruction of the college to its present efficiency and usefulness, its president has had the hearty co-operation of an able, earnest and hard-working corps of instructors. The motto of the institution has been "broader work, better work, more practical work;" and, although its instructors have often been seriously embarrassed by the want of necessary facilities, it is no exaggeration to say, that no year has passed which did not show better work than that of the preceding year.

The trustees of the college have devoted much gratuitous labor to its interests. They have found their reward in the character of its students, and the success of its graduates. The former, coming from good homes, and bringing with them good character, good habits and good health, have exhibited fidelity to their work, loyalty to the institution, and with the exception of occasional ebullitions from immature experience, a very creditable regard for its regulations. Their good deportment and manly bearing have commanded the confidence of their instructors and the good-will of the community around them. Having sought admission to the college for a definite purpose, they have kept it steadily in view from the hour of registration to that of graduation.

The graduates of the institution, at the end of four years of hard study and valuable discipline, pass from its cherished associations to the wide theater of the worlds industries and responsibilities with the bearing of men inspired with the belief of their ability to control the conditions of success. Grasping the ladder that leads to it, they do not linger on the lower rounds. The eminently practical character of the training they have received, enables them to command positions of responsibility and trust without the delay of an intervening apprenticeship. A graduate said to the writer a

few years ago, that all the members of his class, including himself, obtained honorable and lucrative employment within five months from the date of their graduation.

During the early years of the college, fears that it would prove to be only an additional avenue to the "learned professions" were often expressed. Such fears have not been realized. Of its graduates less than twelve per cent are found in the "learned professions." On the contrary, they are widely scattered among the institutions and industries of the country, where they are doing effective work as professors and instructors in colleges, as directors-in-chief and assistants in experimental stations, as teachers, as superintendents of public instruction, and of factories and farms, as engineers-in-chief of railroads and engineers of divisions, as mechanical engineers in manufacturing establishments, as draughtsmen, designers, architects, government surveyors, mechanics and farmers, as veterinarians and superintendants of quarantine stations, and as agents at signal stations.

Distributed through a range of employments so broad, it would be strange if there were not some failures. But the most gratifying assurances are multiplying, each passing year, that the average of success of the graduates of the State college is larger than its most sanguine friends had ever claimed or even expected.

Wherever found, they illustrate the value of the training they have received. An officer of the college, who visited the McCormick manufacturing establishment at Chicago last summer, found three of its graduates who were doing all the draughting for a force of 1800 men, and who had displaced in three years, double their number who had been doing the same amount of work. Measured by the money standard, there are graduates whose services are valued at from $3000 to $6000 per annum.

Citizens of Maine, who have travelled extensively, and have met State college graduates in almost every State and territory, testify that whenever found, they were honoring

the State that gave them birth and the institution that educated them. But it may be objected, that Maine cannot afford to educate so many of her young men for the benefit of other States. Men of energy and enterprise cannot be restrained by State limits. Trained for useful work, they will go where such work can be found, and they may well exclaim as they go—

> "No pent-up" Province "contracts our powers,
> The whole boundless Continent is ours."

It can scarcely be doubted, however, that if Maine capitalists who invest heavily in western securities, would use their money to stimulate business enterprises at home, many of our promising young men who now go west for employment, would gladly remain in their native State.

Maine cannot afford to cherish a spirit of narrow sectionalism. She is one of a great sisterhood of States which are tending towards a common destiny. If that destiny be anarchy, violence, and a failure of republican institutions, Maine will be involved in the common ruin. If, on the other hand, the tendency be strongly and steadily towards the ideal government of the future which is so sensitive to the welfare of the people that "an injury done to the humblest citizen is felt by the whole body politic," the citizens of no State will be more eminently blessed than those of Maine. In these days of violent disturbances among the industries of the country, when the wheels of commerce have been blocked in whole States, and the regular and healthy flow of business has been interrupted over wide areas, its eminent need is men of trained intellects, skilled hands, high moral purpose and American ideas, men who, having been educated in sympathy with labor and invested with an intelligent comprehension of what its rights are, can safely be trusted to determine where such rights *end*, and those of capital begin.

The present condition of the college presents a striking and cheerful contrast with that of the first few fitful and fateful years of its history. Then its board of trustees was charac-

terized as a body incapable of formulating a policy. Yet it had a well defined policy, to which it has persistently adhered from that day to the present. It was not, indeed, written out on parchment in carefully rounded periods, and flaunted ostentatiously before the eyes of the public. Such a proceeding would not have been in harmony with the character of such men as Ex-Governor Coburn and his associates. That policy, briefly stated, was to work with strict fidelity to the purposes of the National and State acts, to build thoroughly so far as the work of building was carried—to build first that which would be needed first, and to be prepared to take the next step forward promptly and intelligently whenever the State should furnish the necessary means. These statements have reference to both the interior life of the institution and exterior construction. In carrying out this policy, the trustees, the president of the college, and the members of the faculty have worked together with entire harmony of purpose. Whether the policy pursued has been successful or not, must be determined by results. In the early days of the college, men, whose previous training had fitted them for the special work required in many of the departments, could not be found. This was a serious embarrassment to the trustees. Now, its departments, much more numerous than then, are filled almost exclusively by its own graduates, and it is honoring drafts made upon it for instructors by other institutions. The accomplished young artist who prepared the plans of the building where we are now assembled, with its admirable adaptations, is a graduate of the college.

By virtue of a recent congressional act, an experimental station has been established as one of the departments of the college. Fifteen years ago, adequate provision for the successful establishment and management of such a station by any agency or agencies, within the limits of the State, would have been impossible. Now, the State college, without inconvenience or delay, has supplied the necessary conditions, and the station is in successful operation. Its chemical

laboratory, with its completeness of equipment, furnishes abundant facilities for analytical work. The able and enterprising director-in-chief, and his competent assistants, are graduates of the State college. The promptness with which the station was organized and made ready for work, attracted attention outside the State, and men engaged in establishing stations for similar work in distant States, have visited the Maine station to seek counsel and advice.

Twenty-five years ago, the future of the State college was involved in uncertainty. The vital question was, shall it live a sickly life in the shadow of some existing institution like a plant shut off from sunshine and rain, or an independent life, invested with the power of expansion and growth? That question has been settled. Resting on the crest of the island once the home of the renowned Indian chief whose name defines its location, and encircled by the waters of one of Maine's noblest rivers, where breezes pure and strong from hill and mountain repel the approaches of effeminacy and impart physical vigor and manliness, the Maine State college stands in well defined outlines, the personifications of robust and vigorous independence.

List of Trustees of the Maine State College of Agriculture and the Mechanic Arts, from 1867 to 1889, and terms of service:

Hon. Abner Coburn, from 1867 to 1879; President of the Board from 1867 to 1879.

Rev. Samuel F. Dike, from 1867 to 1879.

Hon. Wm. P. Wingate, from 1867 to 1883; President of the Board from 1879 to 1883.

Hon. Lyndon Oak, from 1867 to 1889; Secretary of the Board from 1871 to 1883; President of the Board from 1883 to 1889.

Hon. Nathaniel Wilson, from 1867 to 1869.

" George R. Sewall, from 1867 to 1868.

" Isaiah Stetson, 1867; resigned May 15th, 1867.

" Nathan Dane, from 1868 to 1869.

Hon. Thomas S. Lang, from 1868 to 1874.
" S. L. Goodale, from 1869 to 1873.
" S. F. Perley, from 1869 to 1874.
" James C. Madigan, from 1869 to 1879.
" S. L. Boardman, from 1873 to 1879.
" Sylvanus T. Hincks, from 1874 to 1881.
" Caleb A. Chaplin, from 1874 to 1884.
" Luther S. Moore, from 1879 to 1886.
" Emery O. Bean, from 1879 to 1883.
" A. M. Robinson, from 1880 to 1887.
" Z. A. Gilbert, 1880.
" Daniel H. Thing, from 1881 to 1888.
Capt. Charles W. Keyes, 1883.
William T. Haynes, Esq., Secretary, 1883.
Hon. E. E. Parkhurst, from 1884 to 1888.
Gen. R. B. Shepperd, 1885.
Rutillus Alden, Esq., 1888.
William H. Strickland, Esq., 1888.
Hon. Fred Atwood, 1888.

LIST OF TREASURERS.

Hon. Isaiah Stetson, from 1867 to 1879.
Col. Eben Webster, from 1879 to 1883.
J. Fred Webster, Esq., 1883.

List of Presidents, Professors, and Instructors of the Maine State College of Agriculture and the Mechanic Arts, from its organization, 1868 to 1888:

PRESIDENTS.

Merritt C. Fernald, A. M., Acting President, 1868 to 1871.
Charles F. Allen, A. M., D. D., President, 1871 to 1879.
Merritt C. Fernald, A. M., Ph. D., President, 1879.

PROFESSORS AND INSTRUCTORS.

Merritt C. Fernald, A. M., Professor in Mathematics and Physics, 1868 to 1879; Physics, Mental and Moral Science, 1879.
Samuel Johnson, A. M., Instructor in Agriculture and Farm Superintendent, 1868 to 1871.

Stephen F. Peckham, A. M., Professor of Chemistry, 1869 to 1871.

Calvin Cutter, M. D., Lecturer in Anatomy, Physiology, and Hygiene, 1869 to 1871.

Corydon B. Lakin, Instructor in Book-keeping, 1869 to 1870 and 1871.

Capt. Henry E. Sellers, Military Instructor, 1869 and 1870.

John Swift, B. S., Instructor in Botany and Horticulture, 1870 to 1871.

Mrs. Mary L. Fernald, Instructor in French and German, 1870 and 1871.

X. A. Willard, A. M , Lecturer on Dairy Farming, 1870.

James J. H. Gregory, A. M., Lecturer on Market Farming and Gardening, 1870.

A. S. Packard, Jr., M. D., Lecturer on Useful and Injurious Insects, 1871.

E. S. Morse, Lecturer on Comparative Anatomy, and Zoology, 1871.

Wm. E. Hoyt, Instructor in Descriptive Geometry and Mechanical Drawing, 1871.

C. F. Allen, A. M., D. D., Professor in English Literature and Mental and Moral Science, 1871 to 1879.

William A. Pike, C. E., Professor of Civil Engineering, 1871 to 1880.

Robert L. Packard, A. M., Professor of Chemistry and Modern Languages, 1872.

Charles H. Fernald, A. M., Professor of Natural History, 1871 to 1886.

Joseph R. Farrington, Farm Superintendent, 1871 to 1878.
" " Instructor in Agriculture, 1878 and 1879.

Capt. James Deane, Military Instructor, 1871 to 1874.

John Perley, Instructor in Book-keeping, 1872 to 1874.

C. F. Stone, Professor of Chemistry (spring), 1873, three months.

W. O. Atwater, Professor of Chemistry, 1873.

Alfred B. Aubert, B. S., Professor of Chemistry, 1874.

Randall Whittier, Professor of Modern Languages and Mechanics, 1873 and 1874.

Prof. James Law, V. S., Lecturer on Veterinary Science, 1874.

George H. Hamlin, C. E., Assistant in Engineering, 1873–4; Assistant Professor 1874 to 1876; Professor of Drawing and Field Engineering, 1876 to 1879; Professor of Mathematics and Drawing, 1879–80; Professor of Civil Engineering, 1880.

Winfield S. Chaplin, Professor of Modern Languages and Mechanics, and Military Instructor, 1874 to 1877.

Francis L. Hill, Professor of Modern Languages and Military Instructor, 1877 and 1878.

Miss Isabel S. Allen, Instructor in German, 1877.

Timothy G. Rich, Farm Superintendent, 1879 to 1882.

Allen E. Rogers, A. M., Instructor in Modern Languages and Military Science, 1879 and 1880; Professor of Modern Languages and Instructor in Military Science, 1880 to 1882; Professor of Modern Languages, Logic and Political Economy, 1882.

Whitman H. Jordan, B. S., Instructor in Agriculture, 1879 and 1880.

Wilbur F. Decker, B. M. E., Instructor in Shop-work, 1879 and 1880.

Charles H. Benjamin, M. E., Instructor in Mechanical Engineering, 1880 and 1881; Professor of Mechanical Engineering, 1881 to 1887.

Walter Balentine, M. S., Instructor in Agriculture, 1881–2; Professor, 1882.

Walter Flint, B. M. E., Instructor in Vise-work and Forge-work, 1881 to 1887; Professor of Mechanical Engineering, 1887.

Lieut. Edgar W. Howe, 17th Infantry, U.S.A., Professor of Military Science and Tactics, 1882 to 1885.

Gilbert M. Gowell, Farm Superintendent, 1882 to 1887.

Lieut. Charles L. Phillips, Professor of Military Science and Tactics, 1885 to 1888.

Francis L. Harvey, M. S., Professor of Natural History, 1886.

James N. Hart, B. C. E., Instructor in Mathematics and Drawing, 1887.

Howard S. Webb, B. M. E., Instructor in Shop-work, 1887.

Lieut. Everard E. Hatch, Professor of Military Science and Tactics, 1888.

REPORT OF BUILDING COMMITTEE.

To the Trustees of the Maine State College of Agriculture and the Mechanic Arts:

The committee appointed to have charge of the construction of a new building for the departments of agriculture and natural history have attended to their duty and report as follows:

Your committee was appointed March 31st, 1887, and at the same time the board of trustees voted that we supply an architect to make plans and specifications for the proposed building; and this was the first, and, perhaps, the most important duty that your committee have had to perform in connection with the building. After carefully considering the relative merits of all the older architects in our State we finally resolved to give the job to a graduate of our own college, though a young man, and a very young architect but by his own profession very widely known for his published works in his line of business—and, in short, we can say that Mr. F. E. Kidder has in every respect fulfilled our most sanguine expectations; and it has been a great satisfaction to the committee to note the honest and earnest manner in which one of the college graduates has performed his work, amply demonstrating that we can rear men of practical ability as well as theory in the higher mechanical pursuits of life, which in our age of building has, and is yet to form so great a part in our American civilization.

Mr. Kidder has the ability, in our judgment, to take a high place in his chosen profession. This piece of work is a monument to his early skill, which for the purpose designed, has met with the most favorable comment from those who are to occupy it. We commend it to the public, and have no fears of honest criticism from intelligent and unbiased men.

The college and the State are very much indebted to Prof. G. H. Hamlin of the college, who has had the daily supervision of building from beginning to end. The work could

have had no more careful scrutiny had the architect followed its progress from day to day. It is not impossible that the various contractors are equally indebted to Prof. Hamlin for the excellence of their work.

Your committee have felt all through the construction of the building that no blunders would be made so long as he gave it his daily attention.

Proposals for bids for the construction of this building were advertised by your committee, in a number of the leading papers in different sections of the State. Sealed bids were received from seven different parties, and after a careful investigation, your committee gave the work to the lowest bidder, Messrs. J. & J. Philbrook of Portland, Maine, at $19,987 for the entire carpenter and mason work, including foundation, plastering and painting.

The materials and work done show for themselves. The committee feel well satisfied with the contracting parties, particularly in the fact that they presented for extras on this large job a bill of only $560, which was readily allowed by the architect, all of it having been ordered by him or the committee.

We feel that we have dealt with men, who build public buildings, and deal with committees on the same business principles on which they would deal with private parties. The work seems to be well and thoroughly done in a skilful and workman-like manner and according to the letter and spirit of the contract.

The steam heating apparatus was put in by contract, the committee receiving bids from five different parties, three in Maine and two in Massachusetts; the committee in giving this job contracted with the lowest bidders Messrs. Getchell & Co., of Bangor, Maine. It was said by some that we could not get a good job of steam-heating done by Maine parties, but Messrs. Getchell & Co's price was so much below that of Massachusetts parties that we decided to put them under the hardest trade we could make with them and give them the

work, viz: they to do the work and if it did not prove to be to the utter satisfaction of the architect and the committee, that the college should lose nothing, and have the apparatus taken out free of expense, which terms were accepted by them. The works were put in and have passed the test of one of the coldest winters ever known in this cold latitude, and to the perfect satisfaction of all. We claim the job, so far as trial can develop it, a perfect one, which is a good deal to say of a steam-heating job, especially in the State of Maine.

The fixtures and furniture of this building were made and put in their place by Mr. W. O. White of Boston, Mass., under a contract made from plans and specifications by our architect and on sealed proposals, three other parties bidding for the same work, which was given to Mr. White for the only reason that he was the lowest bidder, as he was an entire stranger to us. The committee are much pleased with his work. It was done strictly according to contract by plans and specifications, and within the time named; and no bill whatever for extras. We can say that Mr. White has the highest confidence of this committee, gained from their relations with him in this connection.

To recapitulate, this building has cost the State as follows:

To your committee for expenses	$303 21
Architect	822 65
Superintendent of construction	300 00
Messrs. J. & J. Philbrook on contract	19,987 00
Messrs. J. & J. Philbrook on extras	560 00
Getchell & Co. steam heating	2,159 00
W. O. White on fixture and furniture	2,422 50
Paid for sundry extra jobs .... } Grading and tablet..... }	549 44
Total	$27,103 80

This is $2,103.80 beyond the appropriation made by the State, but we have felt authorized to expend this small amount

in addition to the amount appropriated inasmuch as we were able to carry out all the plans and specifications, and not cramp the design in any particular. For once in the college history we have been able to build and furnish a building all at one job, which will be understood, at least, by the older friends of the college—as a great boom for our favorite institution of learning.

In this we feel that we shall be approved by the last legislative committee for whose liberal recommendation we are greatly indebted. Their parting advice was to construct a building that would be an honor to the State and the institution, and as this excess in cost has come from the fixtures, furniture, grading and other necessary equipments, we consider that we are not entitled to any censure, even if the legislature shall be asked to make this good to the college, and to add more for some further equipments that the building in time is sure to need.

The money is all here, and so invested that it would seem that no citizen of the State can feel shaky at the investment or the security.

To this report I add the contracts made with the various parties who have done the work and an itemized bill paid by the college treasurer.

WILLIAM T. HAINES, *For the Committee.*

RESPONSE—THE NATURAL HISTORY DEPARTMENT.

By F. L. HARVEY.

Mr. President, Honorable Gentlemen, Ladies and Gentlemen:

The department of college instruction in my charge will occupy much space in the beautiful new building we have met to-day to dedicate, therefore it becomes my privilege and pleasure on this occasion to respond in behalf of the *natural history department.*

I have been deeply interested in the general history of the college, as narrated by the historian, and also in the remarks

made by other gentlemen regarding the affairs of the institution. Prior to my connection with the college its history was entirely new to me, yet it seems as though I had heard it before. In fact, it is essentially the same story of struggle—persistent struggle—against many adversities, that could be told by most of the land-grant colleges. And it seems strange that the greatest opposition has generally come from the class of citizens the large-hearted Morrill designed to benefit when he framed the bill creating agricultural and mechanical colleges, and labored so persistently for its passage. The American mind is slow to adopt new ideas or principles without demonstration, but when a measure is shown to be practical, *it is* ready to reap the benefits.

The founding of colleges, for the purpose of co-educating the head and the hand, dignifying labor and elevating the life of the mechanic and the farmer, was an innovation. The very fact that the land-grant colleges have steadily grown in favor among the people, is evidence that they fill an essential place in the educational system of the country.

Proof that a practical education is desirable, can be found in the fact that, though this college is young, yet its graduates are sought and many of its alumni have already been called to positions of trust and responsibility. The way to enhance the usefulness of the college is to increase the facilities for making its courses of study more practical. We are here to-day to rejoice in the wisdom of the legislature that permits the college to take another step in the right direction.

The early struggles, the dark hours, the trials and tribulations of this college, until it emerged into the clear sunlight of assured success, were no detriment to it. They have served to teach the faculty and the board of trustees carefulness and prudence in the management of its affairs, and have called to the support of the college many staunch friends, who have labored for it and for practical education.

Some of the beloved friends of the college who have closed their earthly labors, we honor in the legends to be placed on

this building, while many others, whose hair has grown gray in the service of this institution, are present to rejoice with us to-day.

The growth of the college has been slow, but it has been healthful. The history of the college is important for the lessons which it teaches, but it is the present and the future which interests us most to-day.

I listened in vain for references to the history of the natural history department by the gentlemen who have preceded me. The department has no history worthy of note.

Heretofore but little has been appropriated for studying natural history, and no special efforts made to do practical laboratory work or build a museum. In the past there has been no suitable room for work or a place to store and care for specimens. There is, however, considerable valuable material belonging to the department, the nucleus of a museum.

In the evolution of modern scientific curricula from classical courses of learning, chemistry and physics were the first to claim consideration. The importance of the biological sciences has been tardily recognized.

The physical sciences have usually had preference in the history of individual colleges.

This institution has for many years had a chemical laboratory, equipped for experimental chemistry, and work-shops where students are trained to work in wood and iron. The natural history department has waited until now.

The erection of this building, with its facilities for extended work in natural history, will ever be a prominent landmark in the history of the department and the college.

Compare this beautiful building, with six apartments, equipped with modern museum and laboratory appliances for natural history work, with the single dingy, poorly lighted room in Wingate Hall, that has for years served the threefold purpose of recitation room, laboratory and museum. Every time I go into that room I get the blues. I feel to-day

as though I was about to be liberated from a prison cell. The inspiration of the new surroundings will be a strong incentive to both pupils and teacher, impelling them to do a higher order of work.

The fact that the legislature appropriated the money for this new building is evidence that it appreciates the importance of practical work in the natural sciences, and the position the biological sciences are taking in modern courses of instruction.

The natural sciences underlie the affairs of practical life, and must ever occupy a prominent place in a practical education. To teach them from text-books alone is to make the sciences dry, unattractive and of but little utility.

There should be proper text-books, corrected and supplemented by lectures, illustrated by specimens and enforced by laboratory practice. The student must be brought face to face with the objects and problems of nature.

To to do this, extensive collections and laboratory facilities and appliances are indispensable. The museum filled with representative specimens, and the laboratory supplied with suitable apparatus, are tools in the hands of the teacher of science, enabling him to give thorough practical instruction.

We have the building, but at present there is only a little to put into it. The building of collections and equipping the laboratory with proper modern appliances is largely a problem of the future.

To build the museum and maintain the laboratories will require the earnest co-operation of students, alumni, faculty, board of trustees, the legislature and friends outside of the college.

Undergraduates of the College: You can help increase the collections with specimens from this locality and from other parts of the State. While making class collections, you will frequently find rare vegetable or animal specimens new to the cabinets. By collecting during vacation at your homes, and donating duplicates, you will add valuable mate-

rial to the museum or for exchange. The department will take pleasure in giving you full credit on the labels for any desirable material presented. You plant trees and the ivy vine to perpetuate the memory of your classes. Did you ever think of presentation day and the donating of a class collection or specimen to the museum? Would it not be pleasant to see in the museum the Moose of '89, the Owl of '90, the Deer of '91, or the Caribou of '92?

Ladies and Gentlemen of the Alumni: I can but make an earnest appeal to you. You can materially aid the natural history department without much trouble or expense. When you leave these halls to engage in the work of life, you will be scattered far and wide. Many objects of nature new to you will meet your trained eyes. Do not cast them aside, but preserve them and send them to the college or bring them with you on your annual visits. There is nothing that will so strengthen the love of a graduate for his *alma mater* as to give her substantial aid. When you return in after years it will be a pleasure to see specimens in the museum that have been contributed by you.

Members of the Faculty and Board of Trustees: I desire to thank you for the interest you have taken in the natural history work of the college, and especially to express my appreciation of the kind encouragement and support given me since my connection with the institution.

Gentlemen of the Legislature: In behalf of the natural history department I welcome you to the college on this occasion. Your presence gives us encouragement. We trust your stay will be pleasant, and that it will be a satisfaction to note the progress of the college. We hope that the same generosity which characterized your legislation at the last session will ever be extended to the department, and that you will always be ready to appropriate the necessary funds to maintain the museum and laboratories so they will be the pride of the State.

Amateur students, who from business engagements or other causes are debarred from longer pursuing their chosen science, and yet who have valuable collections in their possession, could build for themselves a creditable and lasting monument and confer a priceless boon upon the science students of the college by donating their collections.

May we not soon be able to speak of the Smith Herbarium, the Brown Collection of Minerals, the Jones Ornithological Collection, &c. &c., as is done by the older colleges?

Can we not further hope that alumni and other friends of the college, who have been blessed with this world's goods, will make *money* donations to the natural history department, and thus form the nucleus of a permanent fund?

I desire to express in behalf of the department my appreciation of the hearty support which has been given it since my connection with the college and to entertain the hope that it will continue to receive such *cordial* and *substantial* aid from students, alumni, faculty, board of trustees, legislature and friends outside of the college, that there may be a steady, healthful growth of the collections and ever increasing facilities for practical laboratory work. Finally we trust that there may be given at this college courses in natural history thoroughly illustrated and eminently practical.

In accepting the keys of this building, so far as they pertain to my department, I feel deeply the increased responsibility resting upon me.

But in this beautiful building so well adapted for its purpose and with the present promising outlook I assume the duties with pleasure, hoping the future will reveal to you, that I have had the good of the students, my department and the college at heart and have faithfully kept the trust reposed in me.

ADDRESS

By Hon. SAMUEL LIBBEY.

Mr. Chairman and Gentlemen of the State College:

It affords me great pleasure to congratulate you, one and all, upon the completion of this beautiful building, one apparently so well adapted to the purposes for which it was constructed.

I am happy to do so as an individual, because ever since its location here, I have had a lively interest in the success of the college as an educational institution. I congratulate you, also, as a citizen of the town honored by its establishment here, because I believe I but voice the sentiment of the entire body of our citizens in wishing the college the fullest measure of success to which it can possibly attain; but, more than all else, do I extend my congratulations as a member of the Senate of the State for 1887, and in behalf of that body which, by a vote of 18 to 8, did its part towards making the construction of this building a possibility. Twenty years has the Agricultural College of Maine been in existence without an agricultural building. Is it any wonder, therefore, that during that time no greater numbers of students have been graduated from its halls to a life upon the farm?

I congratulate the friends of this college wherever they may be; whether upon the sunny plains of the vast west, the rocky shores of the Pacific coast, or the fertile fields upon our Southern borders; whether at home or in foreign lands, that after so many years of weary waiting, a legislature was at last elected, the large majority of which was willing and glad to vote the amount of funds necessary for this purpose, and in due time carried its wish into effect; and it is a source of no small pride to me, personally, the vanity of which I trust you will pardon, that I was able to contribute in my humble way, by voice and by vote, to bring about this most desirable result. I believed then, as I have ever since, that if this college would be what it ought to be, what its friends

intended it should be, this building was a necessity and might, with great propriety, have been erected years ago. Liberal sums had been voted from time to time to meet the wants of the other departments, but when it came to this,— to the agricultural department — you were always obliged to wait. At last, however, the necessity has been recognized, and you have the building complete in all its parts, just as you, yourselves, have planned it, and why shouldn't you rejoice and be exceeding glad?

We have a large number of farmers in this State, nearly one-half the voting population, the majority of whom, always your friends and able allies, are looking to this college as a headquarters in agriculture, from which much light can be shed upon the every-day problems of the farm, the garden, the dairy, and now, of course, you will be glad to meet their wants as best you may.

I congratulate you, also, that this building is to be devoted to a study of the arts of peace, not those of war. Too large a part of the vital forces of mankind have heretofore been absorbed in preparing for, and attempting to, kill off each other in battle, in obedience to the demands of the savage part of our poor human nature, but it is time now to cultivate the arts of peace. Hereafter, in this country at least, let men acquire distinction in the art of bettering the condition of their fellows rather than in injuring it. This is a fortunate age in which to live. At no time in our history as a nation, have the advantages of the people been so many and so varied as now.

Well endowed institutions of learning are springing up all over the land, in which instruction is not confined to literary matters alone, but extends to and includes industrial and scientific topics as well. The influence of the college is for good, and it is well for our State that the advantages of this one are not limited to the children of the wealthy and the prosperous but that by its establishment the way has been opened for all who may come here to secure a liberal, aye a

practical education at a moderate cost, one quite within the means of the people at large. When questions of vast importance to the public welfare are coming constantly to the front for discussion and action and so challenging the attention of all good citizens, we can rejoice that the influence of great wealth is so frequently cast in favor of the up-building of the many rather than the few, a conspicuous example of which you have in the magnificent gift to this institution by the late Gov. Coburn whose memory you will always cherish as that of a large-hearted, open-handed, princely giver from a fortune earned by his own industry or his own energy. He knew how to work, was not ashamed of labor and knew what to do with the large wealth he thereby acquired. His life was no exception to the general rule for we are a nation of workers; the idlers are fewer in proportion than in any other great nation. In this country if a man would eat he must work. There is no privileged class born to a life of elegant leisure, living upon the earnings of others but all must work in some capacity. We have nearly eight millions of workers whose lives are devoted to purely agricultural pursuits in their various forms. Some comfortably seated in easy chairs drive the plow, the mowing machine, the reaper while the sturdy horses do the heavy work; others tickle old mother earth with the hoe, the cultivator and the harrow that she may laugh with a plentiful harvest while others tend the flocks and herds, the cattle upon a thousand hills, the sheep in pleasant vales, each according to his own taste, but toilers all; and so it follows that in value of agricultural and pastoral products America stands at the head of all the nations of the world. From the first settlement of the country down to a time within the memory of many now present, the use of iron for the manufacture of farm implements was unknown; the plow, the harrow even was made of wood, and our present superb equipment of farm machinery existed, if at all, only in the brain of some zealous enthusiast.

A hundred years ago agriculture was in little better condition all over the world than it was a thousand years before.

It is said that the ancient Greeks and Egyptians cultivated their soil better than any portion of the earth was tilled even a century ago. The alternation of crops was almost unknown, fields exhausted by frequent repetition of the same crop were allowed to lie fallow as in the time of Moses, drainage was of the rudest kind and farming implements of the most primitive type. The plow in general use was little better than that of Virgil's time and only scratched the ground. Too often the farmer grasped the poker, as it were, at the hot end, and accomplished what he did only by sheer force of muscle and of will, aided by the bounty of nature. The advance made in agriculture in all its branches during the last half century has been prodigious, due largely to the creation of mechanical appliances by American inventive genius, aided by wealth and supplemented by the assistance of the schools. Hereafter, intelligence more than ever before, is to be counted as a factor of success. The farmer must be instructed as well as the professional man, and we are glad to know that there is to be an institution among us where experiments in cultivation may be tried at the public expense, and the humblest tiller of the soil profit thereby as well as his more favored neighbor. Now that you have secured this building and its accessories, he will naturally expect that with the increased facilities at its command, this college will take another step in advance and give to the 64,000 farmers in this State not theoretical only, but practical hints in the art of successful husbandry which will redound to your credit and to the material and the civic welfare of our agricultural people, the one class of classes there are among us, which stands as the foundation of the success of us all. This I have no doubt you will be pleased to do, and, among the other results, will be the educating of its graduates towards and not away from manual labor as a means of success in life. Again let me congratulate you upon the possession of this beautiful building and upon all the good results which must certainly come from its establishment here; and in closing

permit me to express the belief, which I certainly enjoy, that they builded well who made its construction possible.

ADDRESS

By Hon. Herbert M. Heath.

This college has passed the experimental stage. It has come to stay. Thoughtful men are beginning to appreciate its importance to the pressing problems of the future. The purely literary colleges will ever have a great work in training professional men. But the age cries out for practical men, for mechanics, for men of science to grapple with the blind forces of nature not yet subdued. A literary education is good, but it stops too short. The great mass of mankind cannot possibly earn a living by it. The prizes of the future will be found upon the highway of scientific education. The country needs more captains of industry. We need, and you are giving it, a training that will open the book of life and no longer grope in the graveyard of a dead and musty past. You have grander themes than the jealousies of Juno or the intrigues of adulterous Jupiter. In your development you draw rich draughts from the pure wells of English undefiled, the mother tongue of the people. It is the true creed, French for volatile France, Italian for melodious Italy, German for phlegmatic Germany, the *kai gar* for the Greeks who were asleep before Christ, but strong, sturdy, hearty Anglo-Saxon for the descendants of the men of Runnymede. You may dazzle the intellect with the flowing music of Virgil, you may astonish a gaping audience with soporific Greek, but the key to the inner chambers of the heart is the grand old mother tongue. Our first stock came, not from the classic hills of imperial Rome, not from the gymnasia of Athens, but from the woods of the Saxon and the intervales of the Angle. The language of the parlor will not touch the heart of him that toils in the heat and burden of the day. Demosthenes and Virgil may do for scholars—closet scholars that look out

into the back yard and mistake it for the world,—but men of action can waste no precious time upon the mysteries of the di-gamma or the pulings of love-sick Dido amorous for the company of the sheep-stealer Æneas on his way to jump a claim on the Tiber. That you hug close to an English education is the secret of your success. And why not? Its mines of wealth are inexhaustable—From Chaucer's lisping numbers to Shakespeare's kingly verse, from the rugged English of the Bible, the masterpiece of all, to the swelling music of Milton's majestic rhyme, our language is one grand anthem attuned to the beating of the human heart.

Such a course as yours produces men, men who will believe that cowhide boots will not take the place of brains, nor that a college sheepskin will fit a man for the battle of life unless he is armored with the breastplate of sturdy common sense. The country needs such men. The people are not children to be pleased with the tinkling of a bell. The questions of the hour are practical and material. Grave social and economic problems are pressing for solution. They involve our material advancement; they invade the home; they sit at the table. Men can no longer face the dead past with their noses plunged deep in the rotten sores of a corpse dead lo! these twenty years. They must face the rising sun.

There is a field in Maine for the achievements of the men that yearly go forth from these halls. Our mighty rivers thundering to the sea are destined to make of Maine the Belgium of America. The valley of the St. John and the wonderful valley of the Aroostook have possibilities that defy prophecy. Our quarries will open wide their veins of wealth. "There's an angel in that block of marble," said Michael Angelo. There's an empire in the State of Maine; it needs such hands as yours to make it a living reality. To develop Maine we must be true to Maine, true to her institutions, loyal to her cause. In her triumphal future Maine will have reason to be grateful to this college.

Your dark days are over. The critical period in your history was in '78 and '79, when the legislature failed to draw

the line between true economy and parsimony. It was fortunate that since then the State has been blessed with governors of broad views, who have manfully upheld this college. That the last legislature had the courage to grant such liberal appropriations, is due in a large degree to the inspiration it received from Governor Bodwell, that great hearted executive, whose death was a calamity to his people and his State. Conscious that he was right, the fear of popular disfavor had no terrors to make him hesitate. He marched straight on, following the needle that ever pointed to the star of truth, right and loyalty to his State. I trust I violate no proprieties when I say this college is to be congratulated that the dominant party in the State has put in nomination such a true friend of this institution as Mr. Burleigh. Reared upon a farm in the garden of Maine, I might say of America, he is keenly alive to the importance of your work. Prosperity has never turned his head. A modest, unassuming gentleman, emphatically one of the people, under his administration a liberal policy to this college is assured. From a long and intimate acquaintance with him I feel justified in saying that you have special cause to feel gratified.

Gentlemen, this college has come to stay. It is the people's college. It opens the door to the people's sons. Its inspiration is lofty Americanism. America is a kindly country—generous to a fault. To him that will strip off the embroidered toggery of classic polish and bare himself as did the Olympic runner, America will gladly yield the crown. Neither poverty nor humble birth count for aught in the race for life. We live in a country

> "Whose very latch string never was drawn in
> Against the poorest child of Adam's kin."

Gentlemen, I bid you God-speed in your work.

ADDRESS

By Dr. J. T. Cushing.

Travellers in Rome for centuries past have among other objects of interest, had their attention arrested by vast piles of masonary called triumphal arches. There were originally many of these arches, and not a few are still standing in the most populous parts of modern Rome. They are gazed at, admired, and commented on by thousands of tourists annually. And what is their mission in this day? What, after this lapse of years, do they say to these passing thousands? History, here gives no uncertain sound, no myth, no probability. The record is complete, they bear on their faces the marks of their identity. They were erected by great conquerors, in Rome's palmy days, to commemorate the importance and magnitude of the deeds done by their armies.

The arch of Titus, one of the most celebrated, is covered with sculptured copies of the precious things taken from the temple at Jerusalem, when that city was destroyed. There we see the golden candlestick, with its seven branches, and the sacred vessels made from the patterns given to Moses, even though the originals have long since perished from the earth. The arch of Constantine in its ornamentation, shows us his battles with the heathen and some of the material fruits of his victories, commemorating his first great victory when he saw the sign of the cross in the sky, and by that sign conquered.

These grand arches, seen daily by the people, gazed at by the young and studied by the old, must have been the source of many an instructive lesson, in patriotism, generalship, and manly qualities to the Roman youth and even to us at this late time, they are crowded with instruction and interest. Modern nations do not send out a great general to put all enemies under his feet, but the conquests of these latter days, are no less remarkable, and complete. It took Rome seven hundred years to grow from the city of Romulus to the

empire of Augustus, and the world still cons the story and teaches it to the rising generation.

What shall we say then of the nation, founded by the little band of Pilgrim exiles, which has grown to be so great in less than half Rome's time? What were the first signs of their purpose and principles, that our fathers showed? When they saw their faith triumphant, and their theories successful, they built triumphal arches all over their domain. True, they called them churches and school-houses, and they were built of logs, but they showed none the less, that freedom of thought and liberty of action, that education and advancement had gained victory over despotism and tyranny.

Where is the man or woman in our broad land to-day, that is not prouder of his heritage in what this victory established, and the fruits of which we enjoy, even in our plainest churches and school-houses, yes, a thousand times prouder than if he could trace his descent even to the noblest Roman of them all, and point to great statues and columns in fine architecture as the work of his fathers? We have kept on building triumphal arches all these two hundred and sixty years. They long ago ceased to be built of logs, and when we dedicate a building like the one to-day, it bears the marks of other triumphs.

The wilderness has been made to blossom as the rose; the waste and solitary places have become full of people; all the forces of nature have been subjected to man. The earth has given forth her treasures of coal, iron and stone. The forest has yielded her choicest woods, and all that art and science can do is done to show in this triumphal arch how complete is the victory we, as a nation of working people, have gained over inanimate nature. The very presence of such a building as this marks the onward march of science and art, as well as of education and advancement.

Another thought has been present with me in considering this building. The people of Maine have enjoyed the benefits of statehood sixty-eight years. The "District of Maine"

ceased to be sixty-eight years ago, but only within the last half of this time has Maine seemed to feel her great possibilities and opportunities. It took her many years to learn what statehood meant, and for a long time she seemed still to depend on Massachusetts. She sent thither and to the Western States many of her ablest sons, there to become famous.

Now all this is changed, and the change, though it has been gradual, is a remarkable one in every way. Witness, in proof of this, the educational institutions that have been established in the last twenty-five years. Think of the industries founded and advanced. Think of the improved ways of farming, of dairy work, of orcharding. Look at the most prominent public men of the nation and think how many of them came from Maine. The man to whom all eyes have been turned for the last eight or ten years, it is true is not a native Yankee, but he will be known as Blaine of Maine as long as history endures. Our representatives and senators are men of unusual ability. A Maine man has received the republican nomination for Speaker of the House of Representatives at the last two sessions of Congress, and some of the most important bills considered in Congress for the last half-dozen years on important subjects, such as civil service reform, the fisheries and the shipping interests, have originated with, and been named for, our Maine representatives. These men hold places of advancement and trust, by reason of their ability, utterly out of proportion to Maine's population and wealth, as can be easily seen by comparison with a wealthy populous State like New York. These are only a few of the ways in which Maine is realizing her greatness and impressing her individuality upon national history. I can not speak of other points, but I ask you to scan the State from Aroostook to York, from the head-waters of the Androscoggin to the St. Croix, and cast your mind's eye back to what was the condition of the State thirty years ago, and tell me if I am not right in saying that Maine has awakened to a new life, a sense of her boundless resources and needs.

I regard these services to-day, as at once the result and proof of this great change. Our triumphal arch is erected to show us to be the victors over sloth, ignorance and a blind adherence to the ways of our fathers. It shows us active, independent, educated, advancing men.

We have yet another cause for congratulation to-day. Three years ago, when misfortune had overtaken this institution, when disaster had attended some of its most cherished plans, there were not wanting men in the State, who said abroad that the State College was a failure, that money given to it was thrown away. Yes, even during the last session of the legislature, when the resolve for appropriating the money for this very building, was before the House, men said "let us wait and see what they will do there at Orono, before we give them any more of our aid. Let us see if they can recover from these misfortunes and avoid new ones before we vote any supplies." Fellow citizens, is this the line of your reasoning and the course of your action, when your child falls and breaks a limb? Do you wait till you see if he can get up alone, whether in trying to rise he makes any more missteps, before you offer him generous, willing aid to recover from his hurt and to heal his broken bones? Not such is the thought of any father or mother. You go to your child gladly, you bind up his wounds, and try to alleviate his pain. You inquire into the causes of the accident and if possible remove them, to avoid a repetition of the catastrophe, but you do not leave him to suffer alone till you see how much vitality he has in himself, how much power to get over a serious wound unaided. And is this college any less the child of the State, than these your children are yours? This college has been fostered from its first existence by the State, and has been encouraged to look to it for supplies, and was the State, when its child asked for bread, to give it a stone. When it asked for fish should the child receive a serpent, because, forsooth it had been unfortunate?

Happily these too prudent counsels did not prevail with the legislature of 1887, and we have met to-day to congratulate

each other and this child of the State upon its renewed prosperity and success. Our arch of triumph can be inscribed once more with the symbols of a victory of generous principles, and duty fulfilled over false ideas of prudence and indifference.

I congratulate the president of this college on seeing the completion of this grand triumphal arch. "I know thy works and thy labor, and thy patience, and how thou canst not bear them which are evil and hast borne, and hast patience and hast labored and hast not fainted." Behold the reward of thy labor.

I congratulate you, professors and teachers of this college, in having your needs and wants for better facilities for doing your noble work, at last supplied in this beautiful structure. You can now labor with more assurance of complete success. I congratulate the students on seeing their alma mater rising higher and becoming broader in its material aspect, while in its mental and moral curriculum it is still advancing, and thus becoming in all respects one of the finest institutions of its kind in all our land.

And I will not forget the committee who have had this work in their immediate charge; surely no tax payer in this State will ever have aught of which to complain in regard to the expenditure of the appropriation, made for this object. I doubt if three men could be found in all this State who could have made a wiser use of the funds committed to their charge. They merit the thanks of the entire commonwealth.

I congratulate you all upon the prosperity that attends this institution. And in view of the trials, discouragements and afflictions through which it has victoriously come, to the history of which we have listened this afternoon, the words of one of our most talented poets, James Russell Lowell, in his ideal June day seem most fitting:

> What is so rare as a day in June?
> Then, if ever, come perfect days.
> Then Heaven tries earth, if it be in tune,
> And o'er it softly her warm ear lays.
> Whether we look or whether we listen,
> We hear life murmur or see it glisten.

Now the heart is so full that a drop o'er fills it,
We are happy now because God wills it.
No matter how barren the past may have been,
'Tis enough for us now that the leaves are green.
We sit in the warm shade and feel right well.
How the sap creeps up and the blossoms swell.
We may shut our eyes, but we cannot help knowing
That skies are clear and grass is growing.

Joy comes, grief goes, we know not how,
Every thing is happy now.
  Every thing is upward striving,
    'Tis as easy now for the heart to be true
    As for grass to be green or skies to be blue,
  'Tis the natural way of living.
Who knows whither the clouds have fled?
  In the unscarred heavens they leave no wake,
And the eyes forget the tears they have shed,
  The heart forgets its sorrow and ache,
The soul partakes the season's youth,
  And the sulphurous rifts of passion and woe
Lie deep, 'neath a silence pure and smooth,
  Like burnt-out craters healed with snow.

BULLETIN

OF THE

Maine State College Laboratory

OF

NATURAL HISTORY.

Vol. I.—No. 1.

NOVEMBER, 1888.

A Catalogue of the Minerals and Rocks in the Museum.

AUGUSTA:
BURLEIGH & FLYNT, PRINTERS TO THE STATE.
1888.

INTRODUCTION.

The following catalogue of minerals and rocks embraces all the specimens of any value found in the cabinets, when the writer took charge of the department; together with the accessions for the last two years. This catalogue is a copy of the register in which is kept a record of the minerals and rocks belonging to the college museum.

The minerals have been arranged in the cases according to Dana's system, in the following groups:

I. Native Elements.

II. Sulphides, Tellurides, Selenides, Arsenides, Antimonides, Bismuthides.

III. Chlorides, Bromides, Iodides.

IV. Fluorides.

V. Oxygen Compounds.

VI. Hydrocarbon Compounds.

In Dana's System each species is assigned a definite number, thus gold is 1; quartz 231.

The speciments in the collection each bear a label upon which is written the serial register number and the species number.

With this catalogue and a copy of Dana's Mineralogy in hand a student can find and study, without personal attention, any species found in the collection.

This catalogue is designed to aid the students in doing museum work in mineralogy, and to call the attention of those interested in the cabinets to what we have and what we need.

The collection of rocks will also be arranged in a convenient manner for study.

The collections in the department of Mineralogy and Lithology are meagre, and many of the specimens poor.

Quite a large number of specimens in the cabinet are without tickets showing locality and donor. We will be pleased to hear from any, who have contributed specimens to the college, whose names do not appear. We desire to complete our register and give due credit.

Donations of *good specimens* of species catalogued, and specimens not represented, are solicited.

Special cases, or space, will be assigned, when requested, to donors who contribute a sufficient number of specimens.

There will be published occasional supplements to this list, in which full credit will be given to donors. The best minerals and rocks in the collection came from the Smithsonian Institution and United States National Museum; principally through the kindness of Mr. Geo. P. Merrill, Assistant at the National Museum, Washington, D. C.

The collection of Maine Minerals placed on exhibition by Mr. N. H. Perry, South Paris, Me.; the collection of Maine Granites by F. M. Reed, and the collection by F. A. Mansfield are worthy of special mention.

Mr. L. H. Merrill of the Experiment Station has kindly placed on exhibition in the museum his private collection of rocks.

F. L. HARVEY.
Prof. Nat. History.

COBURN HALL, November, 1888.

CATALOGUE.

CATALOGUE OF MINERALS.

Collection No.	Dana's No.	Name.	No. Specimens.	Locality.	Donor.
1	1	Gold in Quartz	1	British Columbia	Unknown.
2	1	Gold bearing rock	1	California	"
3	1	Gold in Quartz	3	Esmeralda County, Nev	United States National Museum.
4	1	" "	1	California	" "
5	12	Native Copper	2	Lake Superior, Mich	" "
6	12	" "	2	" "	" "
7	22	" Sulphur	1	Nevada	" "
8	22	" "	1	Italy	W. H. Pennell.
9	22	" "	1	"	Chas. Abbott, M. D.
10	25	Graphite	1	Canada	Unknown.
11	25	"	1	Unknown	"
12	25	"	1	Ticonderoga, N. Y.	"
13	25	"	12	Rhode Island	"
14	78	Chalcopyrite and Malachite	2	Maine	S. T Peckham.
15	78	" "	2	"	Unknown
16	78	" and Quartz	1	"	J. E. Bennock.
17	75	Pyrite	1	Unknown	Unknown.
18	125	Argentiferous Tetrahedrite	1	Inyo County, Cal	United States National Museum.
19	29	Stibnite	1	Arizona	" "
20	64	Cinnabar	2	Santa Clara County, Cal	" "
21	56	Sphalerite	1	Unknown	" "
22	61	Chalcocite	1	Pinal County, Arizona	" "
23	49	Bornite and Chalcopyrite	1	Unknown	" "
24	44	Argentiforous Galena	3	Utah	" "
25	44	" " and Cerussite	1	Canon, Utah	" "

26	78	Chalcopyrite	1	Queensland, Australia	United States National Museum.
27	66	Millerite	3	Lancaster County, Pa	" "
28	44	Argentiferous Galena	9	Guilford, Me	Unknown.
29	44	" "	1	Unknown	"
30	44	" "	2	Garland, Me	Albert Gordon.
31	44	Galena	1	Guilford, Me	Unknown.
32	44	"	1	Iowa	J. E. Bennock.
33	44	"	3	"	Samuel Libby.
34	78	Chalcopyrite	1	Canada	Unknown.
35	78	"	1	Unknown	"
36	34	Molybdenite	2	Brunswick, Me	"
37	75	Pyrite	1	Garland, Me	Albert Gordon.
38	75	"	1	Unknown	Unknown.
39	75	"	1	"	"
40	75	"	2	"	"
41	29	Stibnite and Pyrite	1	"	"
42	56	Blende and Pyrite	1	"	"
43	56	Blende	1	Roxbury, Ct	"
44	49	Bornite	1	Unknown	"
45	49	"	1	Bristol, Ct	"
46	44	Galena and Chalcopyrite	2	Unknown	"
47	94	Arsenopyrite	2	Freiberg, Saxony	"
48	94	" and Silver	1	Nevada	Anson Allen.
49	2	Silver and Galena	1	Comstock Lode, Nev	"
50	164	Cryolite	2	Arksut-fiord, Greenland	United States National Museum.
51	159	Fluorite	1	Esmeralda County, Nev	" "
52	159	"	1	Muscalongwe Lake, N. Y	Unknown.
53	140	Cerargyrite	2	Idaho	"
54	138	Salt, (sea water)	1	Portland, Me	W. H. Pennell.
55	138	Rock Salt	2	Lincoln County, Nev	United States National Museum.
56	138	"	1	Unknown	Unknown.
57	179	Corundum	3	Chester, Mass	"
58	179	"	2	Franklin, N. C	"
59	179	"	1	Smyrna, Me	"
60	179	"	2	Newlin, Pa	"
61	459	Margarite and Corundum	2	" "	"
62	180	Hematite	1	Flamout, France	"
63	180	"	3	Lake Superior	J Sumner Rogers.
64	186	Magnetite	2	Brunswick, Me	Unknown.

CATALOGUE OF MINERALS—Continued.

Collection No.	Dana's No.	Name.	No. Specimens.	Locality.	Donor.
65	186	Magnetite	1	New York	Unknown.
66	188	Franklinite, Zincite, and Willemite	2	Franklin, N. J.	"
67	188	" " and Tephroite	2	" "	U. S. National Museum.
68	188	" Rhodonite and Calcite	1	Sussex Co., N. J.	Unknown.
69	188	Franklinite and Willemite	1	Franklin, N. J.	"
70	176	Zincite, Rhodonite, and Franklinite	1	Sussex Co., N. J.	"
71	189	Chromite	1	Texas, Pa.	"
72	189	"	1	Cecil Co., Md.	"
73	192	Cassiterite	2	Winslow, Me.	A. C Hamlin.
74	183	Spinel and Seybertite	1	Amity, N. J.	Unknown.
75	186	Magnetite	8	Unknown	"
76	193	Rutile	4	Campbell Co., N. J.	U. S. National Museum.
77	199	Pyrolusite	1	San Francisco Bay, Cal.	" " "
78	205	Manganite	1	Cartagena, Murcia, Spain	" " "
79	206	Limonite	1	Unknown	Unknown.
80	206	"	1	Salisbury, Ct.	"
81	206	"	1	Unknown	"
82	206	"	1	Piscataquis Co., Me.	B. F. Gould.
83	206	"	13	" " "	"
84	217	Psilomelane	1	Cartagena, Spain	U. S. National Museum.
85	210	Brucite	6	Texas, Pa.	" " "
86	218	Dendrites on Flint	1	Chalk Cliffs, Eng.	W. H. Pennell.
87	218	" " Slate	2	Brownville, Me.	J. S. Williams.
88	180	Ochre	2	Unknown	Unknown.
89	231	Quartz	1	"	"

90	231	Quartz	5	Unknown	Unknown.
91	231	"	7	Arkansas	"
92	231	"	1	Unknown	"
93	231	"	1	"	
94	231	"	2	Chester Co., Pa	
95	231	"	1	Georgetown, Me.	C. W. Rogers.
96	231	Rose Quartz	1	Oxford Co., Me.	E. L. Hamlin.
97	231	" "	1	Unknown	Unknown.
98	231	Smoky "	1	Topsham, Me.	"
99	231	Quartz Geode	2	Warsaw, Ill.	"
100	231	" "	1	Keokuk, Iowa	G. M. Shaw.
101	231	Amethyst	1	Partridge, N. S.	Unknown.
102	231	"	3	Cape Sharp, N. S.	"
103	231	"	1	Lake Superior	"
104	231	"	1	Cape Blomidon, N. S.	"
105	231	"	2	Yellowstone National Park, Wyo.	"
106	231	"	1	Partridge Island, N. S	"
107	231	" Geode	1	Yellowstone National Park, Wyo	U. S. National Museum.
108	231	"	2	" " " "	" " "
109	231	" and Agate	2	" " " "	" " "
110	231	Quartz	3	Unknown	Unknown.
111	231	"	4	"	"
112	231	Agate	5	Cape Blomidon, N. S.	"
113	231	"	4	" Sharp, N. S.	"
114	231	"	4	" Blomidon, N. S.	"
115	231	" and Jasper	5	Unknown	"
116	231	Jasper	5	Digby, N. S.	"
117	231	"	7	" "	"
118	231	"	1	Cutler, Me.	"
119	231	"	1	Unknown	"
120	231	Quartz	8	"	"
121	231	Chalcedony	1	"	"
122	231	"	1	"	"
123	231	"	1	"	"
124	231	"	2	"	"
125	231	" Geode	1	Warsaw, Ill.	"
126	231	"	1	Cape Sharp, N. S.	"
127	231	"	7	Digby, N. S.	"
128	231	"	1	Partridge Island, N. S.	"

CATALOGUE OF MINERALS – Continued.

Collection No.	Dana's No.	Name.	No. Specimens	Locality.	Donor.
129	231	Chalcedony	1	Dixons, Del.	Unknown.
130	231	"	2	Yellowstone National Park, Wy. T...	"
131	231	"	1	Cape Blomidon, N. S.	"
132	231	Chrysoprase	1	Partridge Island, N. S.	"
133	231	Quartz	2	" " "	"
134	231	Flexible Sandstone	1	Stokes Co., N. C.	United States National Museum.
135	232	Geyserite	2	Yellowstone National Park, Wy. T...	" " " "
136	232	"	1	" " " "	" " " "
137	232	Opal	1	Rikuzen, Japan	" " " "
138	241	Rhodonite and Franklinite	1	Franklin, N. J.	Unknown.
139	243	Spodumene	4	Huntington, Mass.	"
140	243	"	1	Windham, Me.	"
141	246	Anthrophyllite	1	Unknown	United States National Museum.
142	247	Asbestus	1	Bohemia	Unknown.
143	247	"	1	Staten Island, N. Y.	"
144	247	Tremolite	1	Sheffield, Mass.	"
145	247	Hornblende	2	Unknown	"
146	254	Beryl	1	"	"
147	254	"	1	Rome, N. Y.	"
148	254	"	3	Portland, Ct.	"
149	259	Chrysolite	2	Blue Hill, Pa.	"
150	259	"	1	Franklin, N. C.	"
151	276	Epidote	2	Brunswick, Me.	"
152	276	"	1	Unknown	"
153	271	Garnet	2	"	"

154	271	Garnet	1	Unknown	Unknown.
155	271	"	1	"	"
156	271	"	2	Brunswick, Me.	"
157	271	"	1	Windham, Me.	W H. Pennell.
158	273	Vesuvianite	1	Unknown	Unknown.
159	286	Danburite	1	Danbury, Ct.	"
160	288	Phlogopite	2	Rossie, N. Y.	"
161	293	Muscovite	15	Middletown, Pa.	"
162	293	"	1	" "	"
163	293	"	1	Pennsbury, Pa.	"
164	293	"	3	Dixous, Del.	"
165	293	"	1	Unknown	W. H. Pennell.
166	311	Labradorite	2	"	" "
167	315	Albite	1	"	United States National Museum.
168	316	Orthoclase	1	"	Unknown.
169	316	"	2	"	"
170	316	"	5	Mt. Desert, Me.	C. H. Fernald.
171	316	"	1	Brunswick, Me.	Unknown.
172	315	Clevelandite	1	Unknown	"
173	316	Orthoclase	1	"	"
174	316	"	1	Mineral Hill, Pa.	"
175	316	" and Magnetite	1	Omar, N. Y	"
176	316	"	3	Middletown, Pa.	"
177	316	"	1	Diana, N Y.	"
178	316	"	1	Dixous, Del.	"
179	316	"	1	Unknown	A. M. Goodale.
180	320	Tourmaline	1	Georgia	United States National Museum.
181	320	" Garnet and Mica.	1	Unknown	Unknown.
182	304	Cancrinite in Elæolite Syenite	4	Litchfield, Me.	"
183	271	Garnet, Quartz, and Mica	1	Unknown	"
184	316	Sunstone in Hornblende	1	Pennsbury, Pa.	"
185	305	Sodalite	1	Litchfield, Me.	"
186	273	Idocrase	1	Minot, Me.	E. L Hamlin.
187	278	Allanite	1	Virginia	Unknown.
188	266	Willemite and Franklinite	2	Franklin, N. J.	"
189	266	"	1	" "	United States National Museum.
190	294	Lepidolite	1	Oxford Co., Me.	E. L. Hamlin.
191	294	"	3	Unknown	W. H. Pennell.
192	319	Chondrodite	2	Warwick, N. Y.	Unknown.

CATALOGUE OF MINERALS—Continued.

Collection No.	Dana's No.	Name.	No. Specimens.	Locality.	Donor.
193	320	Tourmaline	7	Unknown	Unknown.
194	320	"	1	Falmouth, Me	W. H. Pennell.
195	320	"	1	Mt. Mica, Me	Unknown.
196	320	"	1	St. Lawrence County, N. Y	"
197	320	"	1	Oxford County, Me	E. L. Hamlin.
198	320	"	3	Brunswick, Me	Unknown.
199	320	"	1	Unknown	"
200	320	"	1	"	"
201	320	"	2	"	"
202	320	"	1	Haddam, Ct	"
203	293	Muscovite	4	Brunswick, Me	"
204	293	"	3	Fitchburg, Mass	United States National Museum.
205	322	Andalusite, var. Chiastolite	1	Lancaster County, Pa	Unknown.
206	324	Cyanite	4	Unknown	United States National Museum.
207	324	"	2	Bradford, Pa	Unknown.
208	324	"	1	Windham, Me	"
209	333	Staurolite	5	" "	"
210	333	"	2	Unknown	"
211	333	"	3	"	"
212	323	Fibrolite	2	Brandywine Springs, Del	"
213	339	Pectolite	1	Bergen, N. J	"
214	361	Calamine	1	Unknown	"
215	361	"	1	Sterling Hill, N. J	United States National Museum.
216	363	Prehnite	1	Simsbury, Ct	Unknown.
217	367	Cerite	1	Bastanas, Sweden	"

218	370	Apophyllite	3	Bergen, N. J	Unknown.
219	378	Natrolite	1	Unknown	"
220	386	Chabazite	4	Nova Scotia	"
221	392	Stilbite	3	Cape Sharp, N. S	"
222	400	Tale	1	Newlin, Pa	"
223	400	"	1	Unknown	"
224	400	"	3	District Columbia	"
225	400	"	1	North Carolina	"
226	401	Pyrophyllite	1	Deep River, N. C	"
227	411	Serpentine	4	Unknown	United States National Museum.
228	419	Kaolinite	1	Kamogori, Japan	" "
229	419	"	1	Unknown	Unknown.
230	413	Deweylite	4	Chester, Pa	"
231	450	Ripidolite	1	" "	"
232	524	Vivianite	1	Cransae, France	"
233	602	Ulexite	1	Esmeralda County, Nev	United States National Museum.
234	630	Barite	4	Cheshire, Ct	" "
235	631	Celestite and Sulphur	1	Sicily	Eimer and Amend.
236	445	Vermiculite	1	Leni, Pa	Unknown.
237	447	Jefferisite	1	Chester, Pa	"
238	715	Calcite	3	Portland, Me	Dr. Hamlin.
239	715	"	5	Houlton, Me	C. H Fernald.
240	715	"	1	Partridge Id., N. S	Unknown.
241	715	"	1	Unknown	"
242	715	"	1	"	"
243	715	Stalactite	1	Mantansas, Cuba	Mrs. James Howe.
244	715	"	1	Page County, Va	United States National Museum.
245	715	Stalagmite	1	Arizona	Unknown.
246	716	Dolomite	1	Phillipstown, N. Y	"
247	721	Siderite and Cryolite	1	West Greenland	"
248	721	Siderite	2	Unknown	United States National Museum.
249	723	Smithsonite	1	Nijar Almenia, Spain	" "
250	751	Malachite and Cuprite	1	Dayton, Nev	" "
251	751	" "	1	Unknown	Unknown.
252	751	" "	1	Russia	"
253	752	Azurite	2	Unknown	United States National Museum.
254	231	Quartz	1	"	Unknown.
255	315	Albite	1	Oxford County, Me	E. L. Hamlin.
256	289	Biotite	3	Unknown	Unknown.

CATALOGUE OF MINERALS—Continued.

Collection No.	Dana's No.	Name.	No. Specimens.	Locality.	Donor.
257	293	Muscovite	2	Unknown	Unknown.
258	610	Wolframite	1	Zinnwald, Saxony	"
259	617	Wulfenite	5	Eureka Co., Nev	United States National Museum.
260	617	" and Cerussite	1	" "	" " " "
261	718	Magnesite	1	Portland, Me	Unknown.
262	830	Asphaltum	6	Pitch Lake, Trinidad, Id	W. H. Pennell.
263	831	Anthracite Coal	1	Charlotte Co , N. B.	Unknown.
264	2	Silver-bearing Rock	18	Virginia City, Nevada	P. Vinal.
265	231	Quartz	1	Unknown	Unknown.
266	311	Labradorite	1	"	"
267	231	Opalescent Quartz	1	California	Charles Curtis.
268	231	Moss Agate	2	"	" "
269	231	Silicious Sinter	1	"	" "
270	231	Petrified Wood	2	"	" "
271	186	Magnetite	2	Unknown	Unknown.
272	12	Copper Ore	2	Calumet, Mich	W. E. Tripp.
273	186	Magnetite	1	Black River Falls, Wis.	" "
274	206	Limonite	1	Iron River Mich.	" "
275		Iron Ore	1	Norway, Mich.	" "
276	199	Pyrolusite	1	Unknown	Unknown
277	199	" and Chalcedony	1	"	"
278	474	Columbite, Mica, and Garnet	1	"	"
279	247	Asbestus	4	East Broughton, Quebec	L. I Bumpus.
280	293	Muscovite and Columbite	1	Unknown	A. M Goodale.
281	503	Amblygonite	1	Paris, Me	Unknown.

282	25	Graphite	1	Murphy, Cal	Chas. Curtis.
283	1	Gold bearing rock	1	"	" "
284	44	Galena in Quartz	2	"	" "
285	271	Garnet	1	Sidney, Me	Unknown.
286	231	Quartz	1	Pittsfield, Me	"
287	316	Orthoclase	1	Dixous, Del	"
288	273	Idocrase	1	Sanford, Me	H. M. Paine.
289	293	Muscovite, Feldspar and Tourmaline	1	Casco Bay, Me	" "
290	271	Garnet	1	" "	" "
291	44	Argentiferous Galena	2	Mexico	Unknown
292	231	Chalcedony	2	"	"
293	206	Limonite	1	"	"
294	231	Quartz Crystals	4	"	"

ACCESSIONS SINCE 1886.

295	671	Alunogen	1	Esmeralda Co., Nev	United States National Museum.
296	492	Apatite and Biotite	3	Krageroe, Norway	" "
297	724	Aragonite	2	Utah	" "
298	631	Celestite	1	Rossie, N Y	" "
299	715	Calcite	2	Unknown	" "
300	654	Selenite	1	"	" "
301	716	Dolomite	1	Akasaka, Japan	" "
302	316	Perthite	1	Perth, Canada	" "
303	44	Galena	3	Nevada	" "
304	56	Zinc Blende	1	Butte, Mont	" "
305	246	Antrophyllite	1	Baltimore Co., Md	" "
306	231	Quartz Geode	1	Unknown	" "
307	715	Calcite	1	Mexico	" "
308	231	Quartz	1	Unknown	" "
309	12	Copper bearing conglomerate	1	Lake Superior	" "
310	492	Apatite and Calcite	1	Renfrew Co., Canada	" "
311	399	Steatite	1	Nantihala River, N. C	" "
312	492	Apatite	2	Krageroe, Norway	" "
313	316	Orthoclase	1	Maine	" "
314	721	Siderite	4	Germany	" "
315	555	Wavellite	2	Garland Co., Ark	" "
316	654	Satin Spar	3	Mexico	" "

CATALOGUE OF MINERALS—Continued.

Collection No.	Dana's No.	Name.	No. Specimens.	Locality.	Donor.
317	452	Prochlorite	1	Dist. Columbia	G. P. Merrill.
318	231	Jasper	1	Gallatin Co., Mont	" "
319	232	Wood Opal	2	Madison River, Mont	" "
320	401	Pyrophyllite	2	Murphy Co., N. C	" "
321	751	Malachite in Quartz	1	Unknown	Unknown.
322	12	Native Copper	5	Lake Superior, Mich	Lieut. C. L. Phillips.
323	320	Tourmaline	1	Bangor, Me	R. K. Jones, Jr.
324	186	Magnetite	1	Unknown	L. H. Merrill.
325	715	Calcite	1	"	Unknown.
326	716	Dolomite	1	"	"
327	715	Calcite	3	Rockland, Me	L. V. P. Cilley.
328	715	"	2	Unknown	Unknown.
329	715	"	1	"	"
330	715	"	1	Bergen, N. J	"
331	715	"	1	Herkimer Co., N. Y	"
332	715	"	1	Rockland, Me	"
333	715	Calc Spar	1	Ticonderoga, N. Y	"
334	715	Calcite and Quartz	1	Chester Co., Pa	"
335	715	Stalagmite	1	California	"
336	654	Gypsum	1	Nova Scotia	"
337	654	"	1	Unknown	"
338	654	Selenite	1	Nevada	Anson Allen.
339	492	Apatite	1	Rossie, N. Y	" "
340	492	"	2	Burgess, N. Y	Unknown.
341	180	Micaceous Hematite	1	London Co., Va	"

342	231	Chalcedony	4	Uruguay River, S. A.	L. H. Jones.
343	724	Aragonite	1	Unknown	Unknown.
344	724	Stalactitic Aragonite	1	Page Co., Va.	"
345	29	Stibnite	1	Harvey, N. B.	E. D. Graves
346	322	Andalusite var. Chiastolite	1	Orono, Me.	C. H. Benjamin.
347	715	Calcite	1	Franklin, N. J.	F. L. Harvey.
348	831	Peacock Coal	1	Pennsylvania	"
349	715	Calcite and Franklinite	1	Franklin, N. J.	"
350	266	Willemite	1	" "	"
351	266	" and Franklinite	2	" "	"
352	176	Zincite and "	2	" "	"
353	176	" " and Willemite	3	" "	"
354	188	Franklinite and Willemite	3	" "	"
355	266	Willemite	1	" "	"
356	75	Pyrite	2	Pittston, Pa	"
357	231	Chalcedony Geode	1	Iowa	"
358	271	Brown Garnet	1	Franklin, N. J.	"
359	715	Chalk	3	Chalk Cliffs, England	"
360	719	Kaolinite	4	New Jersey	"
361	241	Rhodonite	2	Franklin, N. J.	"
362	186	Magnetite	1	Chautauqua, N. Y.	"
363	186	" in Quartz	1	Mahopac Falls, N. Y.	"
364	186	" in Talc	1	Sing Sing, N. Y.	"
365	201	Gothite	3	Michigan	"
366	180	Hematite	1	Lake Superior	"
367	186	Magnetite	2	Ontario, Canada	"
368	180	Hematite	2	Lake Superior	"
369	180	"	4	Green Bay, Michigan	"
370	180	"	1	North Carolina	"
371	180	"	1	Lake Superior	"
372	186	Magnetite	2	Crown Point, N. Y.	"
373	186	"	1	Sing Sing, N. Y.	"
374	186	" and Garnet	2	Crown Point, N. Y.	"
375	180	Micaceous Hematite	3	Green Bay, Michigan	"
376	206	Limonite	2	Staffordshire, England	"
377	180	Hematite	2	Crown Point, N. Y.	"
378	492	Apatite Crystals	2	Renfrew Co., Canada	Walter Balentine.
379	75	Pyrite	2	Pottsville, Pa.	N. E. Wilson.
380	180	Hematite	3	Tow Hill, Pa.	"

CATALOGUE OF MINERALS—Continued.

Collection No.	Dana's No.	Name.	No. Specimens.	Locality.	Donor.
381	654	Gypsum	1	Tobique River, N. B.	Geo. E. Seabury.
382	78	Chalcopyrite	1	Unknown	W. N. Bond.
383	206	Limonite	1	Buffalo Run, Pa.	N. E. Wilson.
384	13	Spiegeleisen	1	Germany.	F. L. Harvey.
385	293	Muscovite and Lepidolite	1	Auburn, Me.	N. H Perry.
386	294	Lepidolite	1	Norway, Me.	"
387	192	Cassiterite	1	Rumford, Me.	"
388	273	Vesuvianite	1	Woodstock, Me.	"
389	304	Elæolite	1	Litchfield, Me.	"
390	333	Staurolite	1	Windham, Me.	"
391	272	Zircon	1	Litchfield, Me.	"
392	499	Triplite	1	Stoneham, Me.	"
393	430	Damourite	1	" "	"
394	290	Lepidomelane	1	Litchfield, Me.	"
395	254	Beryl	1	Stoneham, Me.	"
396	320	Tourmaline	1	Auburn, Me.	"
397	320	"	1	Stoneham, Me.	"
398	231	Greasy Quartz	1	Albany, Me.	"
399	231	Rose "	1	Standish, Me	"
400	231	Amethyst	1	Stow, Me.	"
401	271	Garnet	1	Buckfield, Me.	"
402	305	Sodalite	1	Litchfield, Me.	"
403	294	Lepidolite	1	Auburn, Me.	"
404	316	Orthoclase	1	Stoneham, Me.	"
405	247	Hornblende	1	Woodstock, Me.	"

406	271	Yellow Garnet	1	Woodstock, Me	N. H. Perry.
407	503	Amblygonite	1	Rumford, Me	"
408	304	Cancrinite	1	Litchfield, Me	"
409	320	Rubellite	2	Rumford, Me	"
410	243	Spodumene	1	" "	"
411	315	Albite	1	Auburn, Me	"
412	224	Cyanite	1	Windham, Me	"
413	186	Magnetite	1	Buckfield, Me	"
414	474	Columbite	1	Stoneham, Me	"
415	293	Plumose Mica	1	Minot, Me	"
416	293	Muscovite	1	Maine	"
417	231	Quartz	1	"	"
418	654	Red Gypsum	1	Guaudaloupe, Tex	Lieut. H. A. Wheeler.
419	831	Jet	1	Fort Bliss, Tex	" " "
420	–	Carbonate of Iron	1	El Paso, Tex	" " "
421	–	Lead Ore	1	El Paso, Mexico	" " "
422	400	Talc and Magnetite	2	Delaware County, Pa	F. A. Mansfield.
423	400	Steatite	1	Weatherfield, Vt	"
424	400	"	1	Graton, Mass	"
425	400	"	1	Francestown, N. H	"
426	400	"	1	Baltimore, Md	"
427	400	"	1	Cambridgeport, Vt	"
428	400	"	1	Hoosac Tunnel, Mass	"
429	400	Talc	1	Camden, Me	"
430	231	Quartz	2	Diamond Hill, R. I	"
431	22	Native Sulphur and Celestite	1	Sicily	"
432	293	Muscovite	1	Paris, Me	"
433	411	Serpentine with Dendrites	1	Unionville, Pa	"
434	411	Serpentine	1	Unknown	"
435	218	Dendrites on Calcite	1	Smithfield, R. I	"
436	44	Galenite	1	Newburyport, Mass	"
437	44	"	1	Camden, Me	"
438	75	Pyrite	2	Bluehill, Me	"
439	247	Asbestus	1	Staten Island, N. Y	"
440	247	Tremolite	1	Canton, N. Y	"
441	247	Actinolite	1	Delaware County, Pa	"
442	247	Asbestus	2	Newcastle County, Del	"
443	247	Tremolite	1	Camden, Me	"
444	247	"	1	Smithfield, R. I	"

CATALOGUE OF MINERALS—Concluded.

Collection No.	Dana's No.	Name.	No. Specimens.	Locality.	Donor.
445	247	Actinolite	1	Cumberland, R. I.	F. A. Mansfield.
446	411	Serpentine	1	Unknown	"
447	247	Nephrite	1	Cumberland, R. I.	"
448	246	Antrophyllite	1	Delaware County, Pa.	"
449	22	Native Sulphur	3	Yellowstone National Park, Wyo.	"
450	231	Smoky Quartz	1	Cumberland, R. I.	"
451	320	Tourmaline	1	Guilford, Vt.	"
452	179	Corundum	1	Unionville, Pa.	"
453	25	Graphite	1	Unknown	"
454	206	Limonite	1	Camden, Me.	"
455	94	Arsenopyrite	1	" "	"
456	186	Magnetite	1	" "	"
457	"	"	1	Unknown	"
458	"	"	1	Charlotteville, Va	"
459	"	"	1	Cumberland, R. I.	"
460	293	Muscovite	1	Smithfield, R. I.	"
461	159	Chlorophane	1	Cumberland, R. I.	"
462	654	Selenite	1	Nova Scotia	"
463	716	Pearl Spar	1	Lockport, N. Y.	"
464	333	Staurolite	1	Mt. Saddleback, Mass.	"
465	316	Orthoclase	1	Paris, Me.	"
466	322	Andalusite var. Chiastolite	2	Camden, Me.	"
467	276	Epidote	1	Cumberland, R. I.	"
468	247	Hornblende	1	" "	"
469	323	Fibrolite	1	Delaware County, Pa.	"

470	290	Lepidomelane	1	Unknown	F. A. Mansfield.
471	75	Pyrite	1	"	"
472	231	Agate	1	Dieppe, France	"
473	654	Gypsum	2	Grand Rapids, Mich.	"
474	654	"	1	Nova Scotia	"
475	715	Dogtooth Spar	2	Springfield, R. I.	"
476	400	Talc	1	Unknown	"
477	231	Mottled Jasper	1	Chelsea, Mass.	"
478	304	Cancrinite	1	Unknown	"
479	320	Tourmaline	1	Lincolnville, Me.	"
480	320	"	1	Avondale, Pa.	"
481	320	"	1	Pennsylvania	"
482	231	Silicified Wood	4	Unknown	"
483	231	Hornstone	1	Camden, Me.	"
484	718	Magnesite	1	Nottingham, Pa.	"
485	411	Sepentine and Calcite	1	Unknown	"
486	411	Bowenite	1	Smithfield, R. I.	"
487	632	Anhydrite	1	Winsor, N. S.	"
488	715	Calcite Crystals	5	Camden, Me.	"
489	40	Argentite	1	Sullivan, Me.	"
490	40	" and Malachite	1	Leadville, Colorado	"
491	715	Calcite	1	Unknown	Unknown.
492	320	Tourmaline	1	"	"
493	231	Jasper	1	"	"
494	316	Orthoclase and Magnetite	1	"	"
495	654	Gypsum	1	Nova Scotia	"
496	231	Blue Quartz	1	Rockport, Me.	F. A. Mansfield.
497	2	Silver Ore	10	Nevada	G. M. Shaw.
498	94	Arsenopyrite	1	Unknown	Unknown.
499	231	Chalcedony	1	"	"
500	231	"	5	"	"
501	231	Silicified Wood	1	King Co., Washington Ter.	E. J. Crocker.
502	231	" "	6	Unknown	Unknown.
503	232	Wood Opal	1	"	"
504		Gems (cut)	8	"	"
505	411	Sepentine	2	"	"
506	474	Columbite	1	Stoneham, Me.	"

CATALOGUE OF ROCKS.

Collection No.	Name.	No. Specimens.	Locality.	Donor.
1	Leopardite	1	Charlotte, N. C	Unknown.
2	Porphyritic Felsite	1	Lynn, Mass	Smithsonian Institution.
3	Red Sandstone	1	Seneca, Md	" "
4	Hornblende Schist	1	Georgia	" "
5	Graphic Granite	1	New Bedford, Mass	" "
6	Mica Schist	1	Unknown	" "
7	Novaculyte	1	Franceway Creek, Ark	" "
8	Sandstone	2	Aquaia Creek, Va	" "
9	Native Copper in Vein-stone	1	Lake Superior	" "
10	Hornblende	1	Cumberland, R. I	Unknown.
11	Calciferous Slate	2	Portland, Me	W. H. Pennell.
12	Plumbaginous Schist	3	Cape Elizabeth, Me	"
13	Joliet Limestone	2	Joliet, Ill	Unknown.
14	Micaceous Slate	1	Unknown	"
15	Fire Brick Clay	1	Rock River, Ill	P. Barnes.
16	Limestone	1	Alton, Ill	"
17	Calcareous Slate	1	Cleveland, Ill	"
18	Potter's Clay	1	Rock River, Ill	"
19	Limestone	3	Unknown	"
20	Fossiliferous Limestone	1	"	Unknown.
21	Serpentine	2	"	"
22	Amygdaloid	2	Cape Blomidon, N. S	"
23	"	1	Cutler, Me	"
24	Serpentine	1	Deer Island, Me	E. Abbott.
25	Sandstone	1	New York	Unknown.

26	Hornblende Biotite Granite	1	St. George, Me	Unknown.	
27	Mica Schist	1	Unknown	"	
28	Hydrous Mica Schist	1	"	"	
29	Mica Schist	1	"	"	
30	Gray Marble	1	Cherokee County, N. C	"	
31	White Marble	1	Rutland, Vt	"	
32	Marble	1	Sutherland Falls, Vt	"	
33	"	1	Italy	"	
34	"	1	Vermont	"	
35	Coraline Sandstone	1	Bermuda Id	Anson Allen.	
36	Blue Limestone	1	Unknown	Unknown.	
37	Hornblende Syenite	1	Berks County, Pa	"	
38	Black Slate	2	Unknown	"	
39	Basalt	1	"	"	
40	Red Hornblende Granite	1	"	"	
41	Mica Schist	1	Washington, D. C	"	
42	Quartzyte	1	Unknown	"	
43	Scoriaceous Basalt	1	"	"	
44	Diabase	1	York Haven, Pa	"	
45	Muscovite Biotite Granite	1	Fitchburg, Mass	"	
46	Brown Obsidian	1	Wyoming	"	
47	Volcanic Tuff	1	Unknown	"	
48	Trachyte	1	"	"	
49	Leucite Basalt	1	"	"	
50	Diabase	1	Staten Island, N. Y	"	
51	Shell Limestone	1	Wayne County, Ind	Smithsonian Institution.	
52	Mica Schist	3	Washington, D. C	"	"
53	Sandstone	1	Amherst, O	"	"
54	Saccharoidal Limestone	1	Plains of Marathon, Greece	"	"
55	" "	1	North Lee, Mass	"	"
56	Hornblende Biotite Gneiss	1	New York, N. Y	"	"
57	Red Sandstone	1	Seneca Creek, Md	"	"
58	Compact Limestone	1	Montpelier, Vt	"	"
59	Canaanite, (White Pyroxene)	1	Canaan, Ct	"	"
60	White Lamellar Limestone	1	Texas, Md	"	"
61	Granite	2	Dix Island, Me	"	"
62	Crystaline Limestone	1	Hawkins County, Tenn	"	"
63	Saccharoidal Limestone	1	Italy	"	"
64	Granite	1	Baltimore County, Md	"	"

CATALOGUE OF ROCKS—Continued.

Collection No.	Name.	No. Specimens.	Locality.	Donor.
65	Franklinite and Zincite	1	Franklin, N J.	Smithsonian Institution.
66	Granite	1	Frankfort, Me.	Hayward Pierce.
67	New, Red Sandstone	1	St. Mary's Bay, N. S.	Unknown.
68	Stalactite	1	Unknown	"
69	Soapstone	1	"	"
70	Talcose Slate	1	"	"
71	Marble	1	Thomaston, Me.	"
72	"	1	Glenn's Falls, N. Y.	"
73	"	1	Unknown	"
74	Graphic Granite	1	"	"
75	Augite Andesite	1	"	"
76	Biotite Granite	1	Dix Island, Me.	"
77	Hornblende Trachyte	1	Unknown	"
78	Granite	1	Mt. Desert, Me.	Hon. Moses Webster.
79	Obsidian	3	National Park, Wyoming Ter.	Unknown.
80	"	1	Esmeralda Co , Nevada.	United States National Museum.
81	"	1	National Park, Wyoming Ter.	" "
82	"	1	Esmeralda Co., Nevada.	" "
83	Granite	1	Thomaston, Me.	F. M. Reed.
84	"	1	Bay of Funday, Me.	"
85	"	1	Mt. Desert, Me.	"
86	"	1	Spruce Head, Me.	"
87	"	1	State Point, Me.	"
88	"	1	Lincoln, Me.	"
89	"	1	Black Island, Me.	"

90	Granite	1	Bluehill, Me.	F. M. Reed.
91	"	1	New Brunswick	"
92	"	1	Bluehill, Me.	"
93	"	1	Hurricane Isle, Me.	"
94	"	1	St. George, Me	"
95	"	1	Belfast, Me.	"
96	"	1	Hallowell, Me.	"
97	"	1	Addison, Me.	"
98	"	1	Quincy, Mass.	"
99	"	1	Red Beach, Me.	"
100	"	1	Mt. Desert, Me.	"
101	"	1	Clark's Island, Me.	"
102	"	1	Bluehill, Me.	"
103	Amygdaloidal Trap	1	Brighton, Mass.	Unknown.
104	Limestone	1	Unknown	"
105	Granite	2	St. George, N. B.	F. W. Holt.
106	"	1	Dix Island, Me.	G. M. Shaw.
107	"	1	Fox Island, Me.	Moses Webster.
108	"	1	Unknown	"
109	"	1	Fox Island, Me.	"
110	"	1	" "	"
111	"	1	" "	"
112	"	1	" "	"
113	"	1	" "	"
114	"	1	" "	"
115	Hornblende Schist	1	Casco Bay, Me.	H. M. Paine.
116	Columnar Trap	1	" "	"
117	Mica Schist	1	Brooks, Me.	J. W. Lang.
118	Infiltrated Quartz	1	"	"
119	Feldspathic Gneiss	1	Auburn, Me.	G. P. Merrill.
120	" "	1	"	"
121	Micaceous "	1	"	"
122	" Hornblendic Gneiss	1	"	"
123	Feldspathic Gneiss	1	"	"
124	Hornblendic "	1	"	"
125	Black Mica	1	"	"
126	Olivene Diabase	1	"	"
127	Slag	2	Woodstock Iron Foundry	C. H. Fernald.
128	Rhyolite Tuff	1	Douglas Co., Colorado	L. H. Merrill.

CATALOGUE OF ROCKS—Concluded.

Collection No.	Name.	No. Specimens.	Locality.	Donor.
129	Quartz Porphyry	1	Mt. Kineo, Me	Unknown.
130	Labradorite	5	Lake County, Minn	L. H. Merrill.
131	Hornblende Andesite	5	Reno, Nevada	"
132	Massive Apatite	3	Krageroe, Norway	"
133	Epidote	1	District of Columbia	"
134	Leucite	1	Vesuvius	"
135	Unakyte	1	Madison County, Virginia	"
136	Melaphyr	1	Brighton, Mass	"
137	Obsidian and Pumice	1	Lipari, Id	"
138	Oolite	1	Florida	United States National Museum.
139	Calcareous Breccia	1	Point of Rocks, Md	L. H. Merrill.
140	Infusorial Earth	1	Unknown	United States National Museum.
141	Zincite, Franklinite, and Willemite	4	Franklin, N. J	" "
142	Elæolite Syenite	5	Deckertown, N. J	" "
143	Dunite	3	Corundum Hill, N. C	" "
144	Shell Breccia	1	St. Augustine, Florida	" "
145	Marble	1	Swayn Creek, N. C	Unknown.
146	Flint	1	Chalk Cliffs, England	L. H. Jones.
147	Slate	4	Brownville, Me	Highland Slate Quarry Co.
148	"	6	Skowhegan	A. E. Mitchell.
	ACCESSIONS SINCE 1886.			
149	Magnetite	2	Mahopac Falls, N. Y	F. L. Harvey.
150	Sandstone	1	Wilkesbarre, Pa	"

151	Oolite	1	Humbolt, Iowa	F. L. Harvey.
152	Graphic Granite	1	Auburn, Me.	N. H. Perry.
153	Mica Schist	1	Peru, Me	"
154	Granite	1	Woodstock, Me	"
155	Marble	1	Vermont	F. A. Mansfield.
156	"	1	Glenn's Falls, N. Y	"
157	"	1	Vermont	"
158	"	1	Tennessee	"
159	"	1	France	"
160	"	1	Italy	"
161	"	1	Tennessee	"
162	"	1	New York	"
163	"	1	France	"
164	"	1	Tennessee	"
165	Syenite	1	Cape Ann, Mass	"
166	"	1	Vinalhaven, Me	"
167	Granite	1	Hallowell, Me	"
168	"	1	Lincolnville, Me	"
169	Limestone	1	Knox County, Me	"
170	Flint	1	France	"
171	Breccia	1	Camden, Me	"
172	Lithographic Limestone	1	Unknown	"
173	Argillyte	1	"	"
174	"	1	Vermont	"
175	Conglomerate	1	Patten, Me	C. H. Benjamin.
176	Felsite	1	Mt. Chase, Me	"
177	"	1	" "	"
178	Limestone	1	Unknown	F. A. Mansfield.
179	Fossiliferous Chert	1	"	"