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BIENNIAL REPORT

OF THE

PRESIDENT OF THE COLLEGE

1906-1908

COLLEGE BULLETIN

ISSUED QUARTERLY

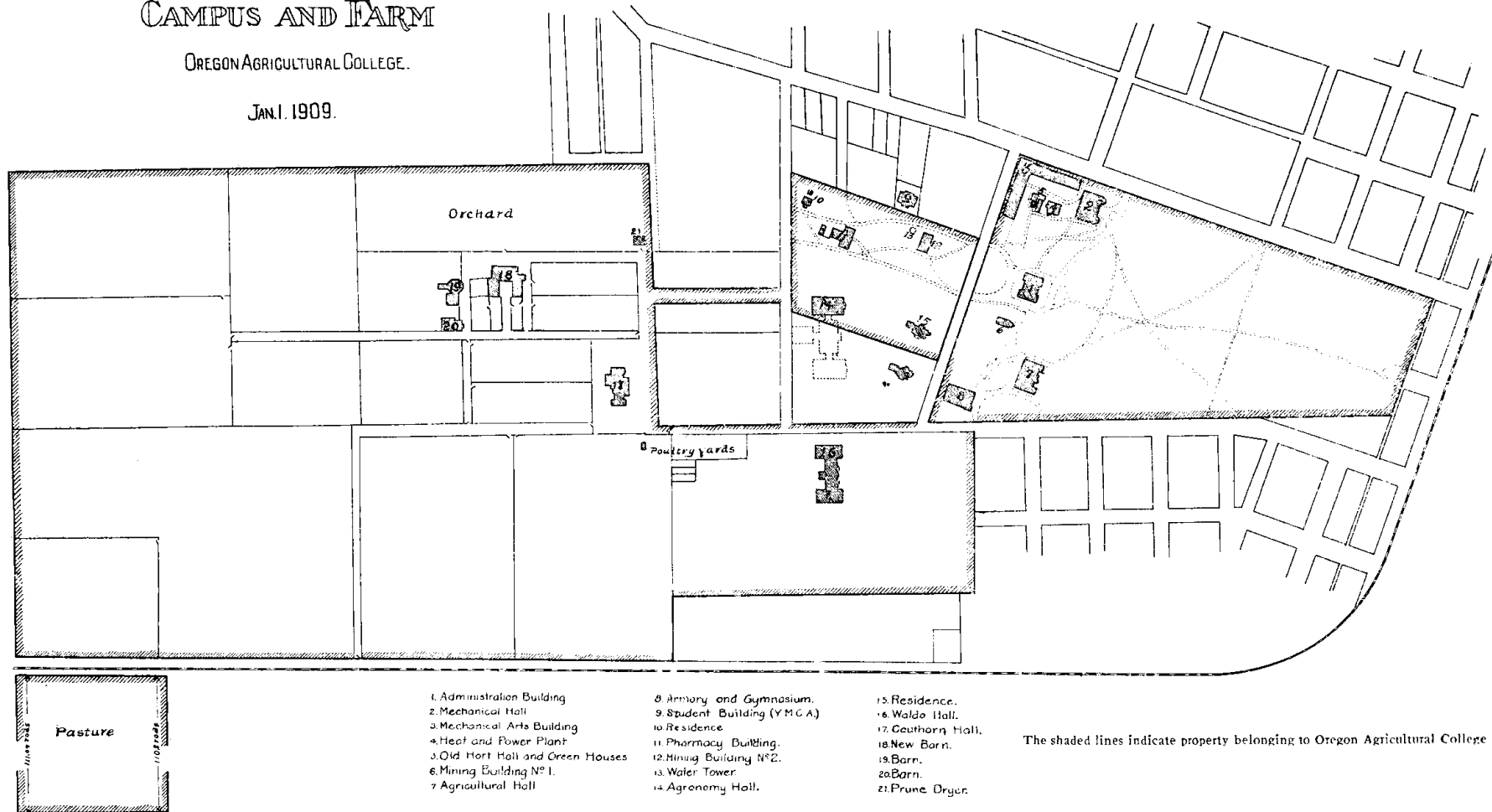
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CAMPUS AND FARM

OREGON AGRICULTURAL COLLEGE.

JAN. 1. 1909.



OREGON AGRICULTURAL COLLEGE

BIENNIAL REPORT

OF THE

PRESIDENT OF THE COLLEGE

1906-1908

OREGON AGRICULTURAL COLLEGE

PRESIDENT'S BIENNIAL REPORT

1906-1908

To the Board of Regents:

The President of the College has the honor to submit to the Board of Regents the following report for the years 1906-1907 and 1907-1908, together with a statement of the condition of the institution and an estimate of the requirements for the biennial period beginning July 1, 1909. For more detailed information your attention is respectfully invited to the appended reports and official College publications, which are submitted as a part of this report. The Appendices include:

1. Reports of Schools and Departments of Instruction.
2. The Report of the Librarian.
3. The Report of the Registrar.
4. The Report of the Director of the Experiment Station.
5. The Report of the Farmers' Institutes.
6. Report on Heat, Light, and Power.
7. Itemized Estimates of Requirements.
8. The Farmers' Institute Annual for 1908.
9. The annual reports of the Experiment Station for the past two years.

STUDENTS.

The number of students enrolled in the College in 1906-1907 was 833. In 1907-1908 the enrollment was 1,156, an increase of 323, or more than thirty-eight per cent over the

previous year. If the students who pursued music only, and those who attended the summer school in 1907-1908, be excluded, the increase is thirty-four per cent. The table in the Registrar's report, giving the geographical classification of students, shows that in 1906-1907 the attendance represented all the counties in Oregon but one, seventeen different states and territories, and two foreign countries; in 1907-1908, all the counties of Oregon, twenty different states and two foreign countries. The total number of students from Oregon was 1,042, and from other states and countries 114. The registration for the present year is incomplete, as many students enter in January. The total enrollment on December 14, 1908, was 1,118, which, compared with the enrollment on the same date of preceding years, would indicate a probable total registration for the year of about 1,400. Moreover, this large increase in the attendance does not fully indicate the rapidity of the institution's growth and of the amount of work required. As shown elsewhere in this report, there has been an increase of from 75 per cent to more than 900 per cent in the amount of advanced work actually given in the different courses. Such an increase in so short a time is not only unusual but is extraordinary, as shown by the following table which gives the student attendance extending over a period of eight years at a number of representative institutions. This table has been compiled from the reports of the United States Commissioner of Education up to June 30, 1907, and from the presidents' reports or the catalogues of the respective institutions for the year 1907-1908.

Enrollment
Distribution.

Increase in
Attendance.

Table showing attendance for each year from 1900-1901 to 1907-1908; also the increase of each year over the preceding year, the total and per cent of increase for the seven years, and the per cent of increase during the last biennium, 1906-1907 and 1907-1908.

INSTITUTION	1900 - 1901	1901 - 1902	Increase	1902 - 1903	Increase	1903 - 1904	Increase	1904 - 1905	Increase	1905 - 1906	Increase	1906 - 1907	Increase	1907 - 1908	Increase	Total increase	Per cent increase for seven years	Per cent increase '07-'08 over '06-'07
California, University of.....	2229	2470	141	2669	199	2688	19	2699	11	2839	140	2761	78*	2916	155	587	29	5
Colorado Agricultural College.....	387	488	61	493	45	433	60*	496	63	502	6	604	102	668	64	281	72	10
Idaho, University of.....	282	306	24	353	47	420	67	333	87*	310	23*	363	53	426	63	144	51	17
Iowa State College.....	1293	1520	227	1596	76	1985	389	1980	5*	2099	119	2381	282	2381	0	1088	84	0
Indiana—Purdue University.....	1049	1187	138	1339	152	1430	91	1534	104	2029	495	1820	209*	2085	265	1036	99	14
Kansas Agricultural College.....	1321	1396	75	1572	176	1605	33	1462	143*	1690	228	1937	247	2192	255	871	65	13
Michigan Agricultural College.....	662	689	27	854	165	923	69	1009	86	950	59*	1001	51	1191	190	529	79	18
Montana Agricultural College.....	279	276	3*	305	29	357	52	339	18*	362	23	372	10	419	47	140	50	12
New York—Cornell University.....	2521	2845	324	3018	173	3091	73	3318	227	3461	143	3523	62	3734	211	1213	48	6
Ohio State University.....	1465	1516	51	1717	201	1803	86	1835	32	2014	179	2277	263	2686	409	1221	83	18
Oregon Agricultural College.....	436	488	52	541	53	530	11*	680	150	735	55	833	98	1156	323	720	165	38
Washington State College.....	488	724	236	595	129*	658	58	793	140	1079	286	1100	21	1336	236	848	173	21

* Indicates decrease.

It will be observed from this table that the increase in attendance during the time given varies from thirty to one hundred and seventy-three per cent in the different institutions, the increase in the Oregon Agricultural College being twice that of any other institution except Washington State College, which during the eight years had an increase of eight per cent greater than that of this institution. It will also be seen that the lead of the Washington over the Oregon institution was gained during the first four years of this period. For the four years, 1904 to 1908, the increase in attendance at the Washington State College was one hundred and four per cent and that of the Oregon Agricultural College was one hundred and eighteen per cent; while, for the two years ending June 30, 1908, the increase was twenty-three and fifty-seven per cent respectively. It is also interesting to note that during the same period the increase for the Kansas Agricultural College, the Michigan Agricultural College, and the Iowa State College of Agriculture and Mechanic Arts, was respectively thirty, fourteen, and thirteen per cent, showing an increase for the Oregon Agricultural College of from nearly two to more than four times the increase in the other representative land-grant institutions. The increase in the registration for 1907-1908 over 1906-1907 varied with the different institutions named from five per cent at the University of California to thirty-eight per cent at the Oregon Agricultural College, the increase at this institution being nearly double that of the largest increase of the other institutions. Furthermore, the estimate given above of the probable total enrollment at the Oregon Agricultural College for the present year will show an increase during the two years, 1907-1909, of sixty-nine per cent. At the same rate of increase for the next biennium, the total College enrollment for the year 1910-1911 will reach upwards of 2,300. A very conservative estimate, therefore, will place the student attendance for the next two years above 2,000.

The ages of students range from 15 to 50, the average age being 19.77. The two extremes are represented by 28

students 15 years of age, and 17 over 30 years of age. The largest numbers are between 17 and 20, there being 126, 203, 178, and 157 who are respectively 17, 18, 19, and 20. Of the students registered in 1906-1907, 617 were men, and 218 were women. In 1907-1908, 920 were men and 336 were women.

Of the number registered on November 19, 1908, 807 were men and 265 were women.

A table has been prepared showing the occupations of the students, or their parents or guardians, from which the following is a summary: Farmers, including dairymen, horticulturists, etc., 51 per cent; architects, engineers, miners, 14 per cent; mechanics, 11 per cent; merchants, druggists, bankers, hotel proprietors, 15 per cent; lumbermen, laborers, 10 per cent; employees, including bookkeepers and traveling salesmen, 4 per cent; lawyers, editors, physicians, teachers, 5 per cent. The table in detail, which is too lengthy for publication here, shows the wide range of the College constituency. Practically all of the professions and trades are represented, there being approximately 95 per cent of the students representing industrial occupations, while the remaining five per cent come from the homes of such professions as medicine, law, journalism, education, and the ministry.

A recent investigation reveals some very interesting facts regarding the extent to which students of the College are engaged in work during the school year and the summer vacation as a means of paying their expenses at College. A summary of the statistics gathered shows that eighty-nine per cent of the students are either wholly or partially earning their own way. All of these work during the summer vacation, while about thirty-eight per cent are employed either at the College or in the city during the college year. Most of the remaining eleven per cent who are not employed either during the summer vacation or during the school year,

Age of
Students.

Vocations
Represented.

Students
Earn Their
Own Way.

are women who spend their summers at home and did not report any remunerative employment. It is not infrequently true that students have to omit a year or two in order to accumulate sufficient money to continue their work to completion. For this reason students have been known to require as many as six or seven years to complete their courses. The persistency and determination of purpose which carry these students through College under such adverse conditions, indicate the character of the men and women—because women as well as men make these sacrifices—who constitute the student body of the institution.

In the Oregon Agricultural College, as in all other institutions with as many students in attendance, there are always a few whose habits of study and conduct are not in every way exemplary, and whose connection with the institution is therefore of short duration. But the great majority of students—in fact most of them—are men and women whose industry, earnestness of purpose, responsiveness, and general deportment, are most commendable. The way in which the students have responded in the matter of abolishing hazing, and other objectionable practices, and their manly and consistent support of the action taken on these questions, at times under great provocation, attest a force of character, a sense of obligation, and a spirit of loyalty, creditable alike to the students, to the College, and to the State.

Since 1870, 752 students have been graduated from the institution with degrees. In 1907 the graduating class numbered 64; in 1908, 84. A report of the officers of the Alumni Association, giving the directory and position of its members, shows that the graduates occupy many positions of responsibility and trust. Among them are lawyers, judges, engineers, merchants, druggists, journalists. Many are following different agricultural pursuits, and a number are in the Government Service. Twenty-eight are members of the College faculty, and upwards of seventy are teaching in other educational insti-

Character of
Student Body.

Graduates.

tutions; while forty-one are pursuing advanced work as graduate students in different colleges and universities.

FACULTY.

During the year 1906-1907, the faculty consisted of forty members, including the administrative officers, the librarian, and two instructors in Music who had private work only and received no compensation from the College. There were sixteen professors, one associate professor, three assistant professors, eleven instructors, and five assistants. A number of the members of the faculty divided their time between the work of instruction and of the Experiment Station, the instructional force being equivalent to the full time of twenty-six instructors.

During the year 1907-1908, the faculty comprised fifty-three members, exclusive of three instructors who had Music only. There were twenty-three professors, one assistant professor, sixteen instructors, and six assistants. Of these, one professor, two instructors, and three assistants, gave their entire time to station work; while nine professors and two instructors divided their time between the College and the Station. The instructional force for this year was equivalent to the full time of thirty-three instructors.

For the present year the faculty numbers seventy-seven members, including administrative officers and four instructors in Music who receive no compensation from the College. There are twenty-four professors, three assistant professors, twenty-four instructors, and fifteen assistants.

One professor and five assistants give their entire time to experimental work; while seven professors, three instructors, and two assistants divide their time between the College and the Station, and eight assistants are pursuing regular courses in the institution and give only part of their time to assistance in the laboratories. During this year the instructional force is equivalent to the full time of fifty instructors.

Faculty
Statistics.

Division of
Work.

The ratio of instructors to students was, for the year 1906-1907, one to thirty-two; 1907-1908, one to twenty-three; while for the present year, estimating the total attendance at 1,425, the ratio would be one to twenty-eight. In order to insure efficient work, the number of students to each instructor should not exceed fifteen. The average in the large colleges and universities of the country is much smaller even than this. For example, the ratio of students to professors and instructors in Harvard is 8.8; in Stanford, 12; in Yale, 11.1; in Princeton, 8.2. In a number of representative land-grant institutions the ratio is as follows: Cornell, 10.3; California, 11.2; Wisconsin, 11; Illinois, 12; Michigan, 11.4; Massachusetts, 9.8; Montana, 8.4; Washington, 16.6; Kansas, 19; Iowa, 16.9; Indiana, 12.1. The average in all the land-grant institutions for 1907 was 11.5.

Notwithstanding the congested condition throughout the institution, occasioned by the large increase in attendance, with insufficient funds to provide for a corresponding increase in the room, equipment, and instructors, the work of the faculty has been marked by hearty, active, co-operation, and efficiency. Many members of the faculty have labored under very trying conditions, with unsuitable and insufficient room, inadequate equipment, excessive hours, and large classes. That they have remained with the institution, some of them at great personal sacrifice, receiving comparatively low salaries, has been due largely to their abounding faith in the future of the College, and to the attractiveness of the field in Oregon for work of research and instruction along industrial lines. In no other part of the country are there problems of greater interest to the scientific specialist. This is always a strong attractive power, but the College cannot expect long to retain the services of its best and most capable men on the present schedule of salaries.

In this connection it may not be inappropriate to direct attention to the position the Oregon Agricultural College occupies among other land-grant institutions in the matter

of salaries. From statistics compiled by the United States Commissioner of Education in his report for the year ending June, 1907, a table has been prepared showing the salaries paid by each land-grant college, to professors, assistant professors, instructors, and assistants. According to this table, the lowest salaries, without a single exception, are paid by the Oregon Agricultural College. Indeed, the salaries paid by many of the institutions to associate professors, and even to assistant professors, are higher than the salaries paid to full professors in this institution. For instance, the difference in the maximum salaries paid to professors

**Salaries of
Professors.**

by the Oregon Agricultural College and the Washington State College was \$500; the Massachusetts Agricultural College, \$1,000; the Iowa State College of Agriculture and Mechanic Arts, \$2,000; the North Dakota Agricultural College, \$550; the Kansas Agricultural College, 500; the Colorado Agricultural College, \$500; the Montana Agricultural College, 400. While the salaries of the Oregon Agricultural College have been somewhat increased since 1907, there has also been, in most cases at least, as great an increase in the salaries paid by the other institutions named.

No college can succeed without a strong faculty. Adequate buildings, adapted to particular purposes, and extended equipment, are indispensable in the work of a modern scientific school; but, after all, it is upon the faculty that an institution depends for its strength. It has been said of large commercial enterprises that the men make the business.

**Strong
Faculty
Required.**

It is no less true that the faculty make the college or the university. To insure thorough and efficient work there must be strong, capable men and women, of broad experience and high scholastic attainments, in charge of the several departments. The demand for industrial specialists in the agricultural colleges and experiment stations, in the United States departments of agriculture, and in various industrial enterprises, is far greater than the supply. It

cannot be expected, therefore, that the College can retain in its service for any great length of time professors whose training, experience, and ability qualify them for the most successful work, unless the salaries approximate at least those paid by other similar institutions.

Changes in the heads of departments unavoidably result in changes in departmental method and policy, and impair the efficiency of the instructional as well as of the experimental work. It requires years of practical experience with students and in the administrative work of a department for a young man, whatever his scholastic attainments may be, to qualify for the responsibilities of a professorship.

Importance of
Permanency in
Positions of
Professors.

Moreover, time is required for a professor to become sufficiently acquainted throughout the State to insure the proper adaptation of his work to local conditions. This is no less true of the instructional work, in the technical departments at least, than it is of the work of research and experiment. Hence the stability and character of the work throughout the institution depend largely upon permanency in the positions of the heads of departments. The College cannot afford, therefore, to allow professors who have acquired that wisdom and breadth of scholarship that come only from years of experience, and who have become thoroughly acquainted with the economic and other conditions throughout the State, to leave the College because of greater financial inducements offered by other institutions.

The large financial rewards open to specialists in various business enterprises render it more and more difficult to retain strong men permanently in college work.

Carnegie
Foundation for
Advancement of
Teaching.

As a means of attracting larger numbers to the teaching profession, and of encouraging those who are devoted to the work of education, Mr. Andrew Carnegie, in 1905, established the Carnegie Foundation for the Advancement of Teaching, by transferring to a body of trustees, \$10,000,000 in five-per-cent bonds, the revenue from which should be used to pro-

vide retiring pensions to teachers in American colleges, universities, and technical schools. The following paragraph from Mr. Carnegie's letter to the men who had been selected as trustees indicates the general purpose in view in the establishment of this fund:

"I have reached the conclusion that the least rewarded of all the professions is that of the teacher in our higher educational institutions. New York City generously, and very wisely, provides retiring pensions for teachers in her public schools and also for her policemen. Very few indeed of our colleges are able to do so. The consequences are grievous. Able men hesitate to adopt teaching as a career, and many old professors whose places should be occupied by younger men, cannot retire."

The importance of the Foundation in promoting the advancement of higher education is very clearly set forth by President Pritchett in his first report to the Board of Trustees, wherein he says:

"It had for a long time prior to the establishment of this Foundation been evident that the time was approaching when, for the sake of education no less than the teacher, the remuneration of the teacher's calling must be increased. The teacher carries into his profession a large measure of devotion and finds his chief recompense in the work itself; but, in the long run, it is clear that the strong men will be attracted in diminishing numbers to this profession unless with the moral and intellectual reward there can be coupled at least stability of employment and protection against old age. Interested in this situation, and desiring to aid in a large and helpful way the whole body of American teachers, Mr. Andrew Carnegie decided to found an agency for providing in the higher institutions of learning in America a system of retiring allowances; and in doing this he had in mind not only the betterment of the teacher, the relief of men who find themselves helpless after long years of honorable work, the dignifying of the teacher's calling, but also the freshening of the work of the colleges themselves, by enabling them to put new men into the places of those whom old age or disability has rendered unfit for service."

System of
Retiring
Allowances.

The purpose of this Foundation, however, is not confined alone to the retirement of professors on pension. The certificate of incorporation provides that the particular objects of the corporation shall be to receive and maintain a fund, the income of which shall be, (1) "to provide retiring pensions, without regard to race, sect, creed, or color, for the teachers of universities, colleges, and technical schools in the United States, the Dominion of Canada, and Newfoundland;" (2) "to provide for the care and maintenance of the widows and families of the said teachers;" (3) "to make benefactions to charitable and educational institutions, and generally to promote the cause of science and education."

In the establishment of this fund Mr. Carnegie excluded from the beneficiaries thereof all state colleges, universities, and schools, on the assumption that the states would prefer to care for their own institutions. As explained by President Pritchett, however, in his report for 1908, Mr. Carnegie, on March 31 of this year, extended to these institutions the benefits of the Foundation, and increased the fund by an additional \$5,000,000.

In the matter of pensions, the Foundation deals exclusively with institutions—not with individuals. The pensions are paid to the institutions from which the professors receive retiring allowances the same as the regular employees receive their salaries. Special emphasis is placed by the Foundation upon the payment of the pensions as a matter of *merit* and not of favor. As stated by Dr. Pritchett in a recent address, the Foundation stands today an educational agency—not a charitable institution. Since it has "to deal with education from the standpoint of a continent and not from the standpoint of an individual institution, or even from the standpoint of a great state," the Trustees have established certain standards as a means of determining eligibility to participation in the benefits of the endowment. Under the present regulations of the Board no institution can be

Purpose of the
Foundation.

Eligibility
Requirements.

come a beneficiary that does not articulate with the standard high school—that is, require for admission to its courses the completion in a standard high school of four years' work or its equivalent.

It will be observed, therefore, that while the land-grant institutions as a class have become beneficiaries, the Oregon Agricultural College is not eligible to receive from the Carnegie Foundation retiring allowances for its professors, because this institution does not require the completion of the work of a standard four-year high school as a prerequisite for entrance upon its degree courses. However, notwithstanding the importance of the retiring pensions, very little consideration will show the impracticability of attempting to change the standard of the College merely for the sake of the pension system. The first obligation of the institution is to the State, and its policy must be determined by the educational conditions and the industrial requirements of the State.

College
Not Eligible.

BUILDINGS AND IMPROVEMENTS.

The State Legislature in 1905 appropriated \$65,000 for buildings; however, the appropriation was not available until 1907. It had been the intention of the Board of Regents to construct a woman's dormitory, with provision in the building for the work in Domestic Science and Art; and a drill hall for the department of Military Science and Tactics; but, during the interval between the time the appropriation was made and when it became available, prices had advanced to such an extent on all kinds of building material and on labor, and the cost of making the necessary sewer and water connections was so much greater than estimated, that it was found impossible to construct the two buildings as originally contemplated, and the entire amount was used for the woman's building. The contract was awarded early in 1907, and the building was completed in time for occupancy the following November, at a cost of about \$76,000. It will be

Waldo Hall.

observed, therefore, that although the entire appropriation was used for this building, an additional \$11,000 was required, and rather than to change the plans for the building this amount was advanced from the College miscellaneous funds. This building, which is known as Waldo Hall, is a substantial structure of concrete and brick, 96 feet by 240 feet, with three stories and basement. It contains 115 rooms for the accommodation of students, besides the kitchen, dining rooms, and parlors; and the office, laundry, and scientific laboratories for the work in Domestic Science and Art.

In 1907 the Legislature appropriated \$65,000 for each of the years 1907 and 1908 for the construction and equipment of buildings. During the year 1907, plans were completed and a contract awarded for the Mechanic Arts building, or Shops, the Dairy Barn, and the Poultry Houses. The Mechanic Arts building is a modern structure constructed of brick with concrete foundation. It consists of a central part

52 feet by 52 feet, two stories in height, with a
New Shops. one-story wing on the east 40 feet by 220 feet;
and another on the south 40 feet by 200 feet.
The central portion, in addition to the offices, contains a drafting room, finishing room, tool rooms for the machine shop, a display room for students' work and toilet and locker rooms. The south wing contains a class room, a bench room, and a machine and storage room for woodwork, and the College printing plant; while in the east wing are the machine shop, the forge shop, and the room for the blast and exhaust fan and for the storage of coal and iron. The shops are all well lighted and provided with the most modern equipment. The benches, tables, cases, and other equipment of the woodworking shops were all designed and made by the department. This building was ready for occupancy on January first, but was not entirely completed until the summer of 1908. The cost of the building, with new equipment, was \$52,000.

The new barn is one of the best buildings of the kind in the country, and cost \$16,500. It is a frame building with

brick pilasters and concrete foundation. The main part is 60 feet by 100 feet, two stories in height, with two wings extending to the south, each 46 feet by 80 feet, one story in height, and a small extension for a milk room and an engine room. It has accommodations for seventy cattle and nine horses, with a storage capacity on

Dairy Barn. the second floor of 110 tons of hay. In addition to the horse stalls, the first floor of the main building contains grain bins, a seed room, and a room for vehicles. There is also storage room in the concrete basement for 100 tons of roots. The east wing has a concrete floor and is equipped with two large box stalls and with iron adjustable stalls for thirty cows. The isles are unusually wide for the convenience of students in their work with live stock. The west wing has a cement floor, but there were insufficient funds to provide the stall equipment. This wing is being used during the present year for work in agricultural mechanics. For want of funds it was impossible to have the walls of the barn finished on the inside, as provided in the plans and specifications.

The Poultry buildings comprise an incubator house with a capacity of twenty-four incubators, and twenty-eight colony houses and brood coops. The colony and brooding houses are movable, and are constructed on a plan that could be adopted by farmers. These buildings are used for work of both investigation and instruction, and cost about \$2,500.

**Poultry
Building.**

Part of the Poultry buildings were completed during the present year.

With the appropriation available in 1908 for buildings, the north wing of the proposed Agricultural Hall, known as the Agronomy building, has been constructed at a cost of \$30,750, exclusive of equipment. On account of the difficulty in procuring material and workmen, the building was not completed and ready for acceptance until December 14th. It will be provided with sufficient equipment for use when the College opens after the Christmas holidays. This build-

ing is constructed of brick and concrete, and is 130 feet by 72 feet, three stories in height. It contains twenty-six laboratories, offices, and class rooms, and is eventually to be used entirely for agricultural work. At present, however, it is necessary to relieve the general congestion throughout the institution by using part of this building for other departments.

Agronomy
Building.

In addition to these buildings, the building for the Young Men's and Young Women's Christian Associations, known as Shephard Hall, the foundation of which was built some years ago, is being completed and will be ready for occupancy on January 8th. This building will cost when completed about \$21,000, without equipment. The entire cost of the building is being met by contributions from individual members of the Board of Regents, the faculty, the students of the College, and by prominent citizens of Oregon and other states. The building is 47 feet by 73 feet, three stories in height with basement. In the basement are the swimming pool, shower baths, lockers, and a banquet room. The first floor is devoted to a large room for reading, for social events, and for general assemblies; the Secretary's private and public office; a check room; a special room for the use of the Young Women's Christian Association; and a room to be used as an office for the student papers and the Athletic Association. The second floor contains six large rooms for the use of the student literary societies, while the third floor will be used at present for dormitory purposes. The completion of this building not only provides splendid facilities for the work of the Christian associations, but also relieves the congestion in other buildings by furnishing rooms for the different student organizations.

Shepard
Hall.

In connection with the building operations of the past year, a general plan for the development of the institution has been carefully prepared, with such grouping and location of buildings as will best serve the interests of the different

schools and departments, provision being made for such additions as may be needed from time to time as the growth of the College may require. A map has also been prepared by the department of Civil Engineering, with all buildings, sewer and pipe lines, and heating mains located; and with contour lines given showing the topography of the campus.

In addition to the completion of the new buildings, other important improvements have been made, making possible a re-adjustment of work that has greatly strengthened a number of departments.

Other
Improvements. The removal of the machine and woodworking shops to the new Mechanic Arts building, vacated two large rooms in Mechanical Hall which were remodeled for an instrument room, a class room, and an office for the department of Civil Engineering; class rooms for Electrical and Mechanical Engineering; an Electrical laboratory, and a general engineering laboratory. The cost of these improvements was \$1,141.

Cauthorn Hall, the men's dormitory, has been remodeled and provided with modern toilet rooms at a cost of \$4,100. This building had been used for a great many years with practically no expenditures for repairs, except for outside painting, and its condition was such that the above expenditures could not be avoided, not only in preserving the building, but in making it fit for use.

The Administration building has been partly remodeled on the first and second floors, providing a reading room and stack rooms for the Library; offices for the Registrar; and a vault and rooms for the Business office and for the Book Store. The entire cost of the improvements in this building, including stacks for the Library, was \$3,700.

The destruction of the old residence that had been used for the Pharmaceutical laboratory and class rooms, in order to make room for the new Mechanic Arts building, made it necessary to provide otherwise for the department of Pharmacy. On completion of Waldo Hall, the old dormitory for women—Alpha Hall—was vacated, and this building

was remodeled and equipped for the work of this department at a cost of \$1,600. This building also contains recitation rooms for some of the work in language and mathematics.

The one-story brick building that had been used for the work in blacksmithing until the completion of the new shops has been remodeled and provided with the necessary equipment for laboratory work in geology, mineralogy, and assaying, at a cost of approximately \$1,950.

The large increase in the number of students pursuing the different courses in Chemistry, referred to in another part of this report, made it necessary to remodel the laboratory desks, provide additional drawers and cupboard space, and to make other changes in the arrangement of rooms, which, together, cost \$750.

On account of the large number of students pursuing work in Physical Education, it has been impossible to provide adequately for this work. In order to make the best possible use of the available space, the bowling alleys have been removed and the rooms provided with lockers for the use of women as a dressing room. Additional lockers have also been provided for the men, and more adequate provision has been made for heating the water. The total cost of these improvements was about \$1,200.

On completion of the new barn for the dairy herd and work in Animal Husbandry, the old barns were removed to a convenient place west of the new barn so as to get them entirely away from the men's dormitory and other school buildings, at a cost of about \$750. These barns with a small additional expenditure for remodeling and repairing will provide feed stables and other room required for experimental work in live stock.

Old Barns
Removed.

Between \$25,000 and \$30,000 have also been expended during the two years for equipment, including the incidental equipment most needed by the general departments; physical and other apparatus required in the different scientific laboratories; fixtures for the department of Commerce; desks, tables, chairs,

New
Equipment.

for the accounting room, the library, and the department of Domestic Art; and the necessary ranges, desks, gas fixtures, and other accessories for the Domestic Science laboratories.

ORGANIZATION.

In accordance with the action of the Board of Regents on July 17, 1907, definite plans were prepared during that year for the further development of the work throughout the institution, and a number of important changes were made in the organization of the several departments. The increase in the student attendance and the general growth of the College made it necessary to extend the organization and to provide for closer specialization. Accordingly the general department of Agriculture was abolished and in lieu thereof professorships were established in Agronomy, Animal Husbandry, Dairy Husbandry, and Poultry Husbandry, and a specialist was placed at the head of each of these departments. The work in veterinary science was temporarily provided for in the department of Animal Husbandry.

Segregation
of Work.

The work in mathematics and civil engineering was segregated, Professor Skelton taking charge of the department of Civil Engineering and giving his entire time to this department; and Assistant Professor Johnson was promoted to a professorship and placed in charge of the department of Mathematics.

The work in Mechanical and Electrical Engineering was segregated, Professor Covell continuing in charge of Mechanical Engineering, and a professor being employed to take charge of the department of Electrical Engineering.

The departments of Chemistry, Pharmacy, and Mining, were also more fully organized. Professor Knisley, who had had general charge of all these departments, was relieved of the responsibility in connection with the work in Pharmacy and Mining and was made Professor of Agricultural Chemistry and Director of the chemical laboratories. Professor Fulton, who had divided his time between Chemistry and Mining, was made Professor of General and Analytical

Chemistry; Assistant Professor McKellips was made professor and placed in charge of the work in Pharmacy; and a Professor of Mining Engineering was employed to give his entire time to the work of this department.

As explained in another part of this report, on account of the demand for special training in veterinary science in the development of the live stock interests of the state, the Board of Regents, at its meeting held in January, 1908, further segregated the agricultural work and established a professorship in veterinary science. For want of funds, however, with which to meet the expense, it was found necessary to postpone the employment of a professor to take charge of the veterinary department.

Veterinary
Science.

A more thorough organization throughout the College was also authorized, as a means of securing a proper division of responsibility and of adding generally to the effectiveness and efficiency of the work. Schools were established in Agriculture, in Domestic Science and Art, in Engineering and Mechanic Arts, and in Commerce; and the instructional corps was organized into the Administrative Council, the College Council, and the Faculty. Each of the schools comprises all of the departments doing work along the different lines indicated by the name of the school.

Schools
Established.

The Administrative Council consists of the President, the Director of the Experiment Station, and the deans of the different schools. The work of this Council is, for the most part, advisory, and relates to the larger questions of school and College policy. Through it the President has an organized ready means of keeping in close touch with the different schools and departments. The College Council comprises the President, the heads of all departments, the Registrar, and the Librarian. This organization may be regarded as the legislative body, its function being to consider questions relating to the educational work and policy of the College, to pre-

Organization
of Instructional
Corps.

scribe the requirements for admission and for graduation, and to act upon all applications for graduation. The Faculty is composed of the President, the Professors, the Assistant Professors, the Registrar, the Librarian, the Instructors, and the Assistants. The Faculty considers ordinary questions of method and discipline, and various matters relating to student activities and to the general interests of the College community.

In addition to the above organizations of the instructional force, there is the Experiment Station Staff, which includes the President of the College, the Director of the Experiment Station, and the heads of all station departments with their assistants. The duties of the Station Staff, as an organized body, relate to questions of method and policy in connection with the agricultural work of research and investigation.

The different departments throughout the institution have also been more fully organized, the respective functions of the professors, the assistant professors, and the instructors being clearly defined, with special emphasis upon professorial responsibility.

On the business side, a plan has been adopted whereby all expenditures are made under regulations which insure the best possible use of the available funds for the development of both the departmental and the general

**Methods of
Business.**

College interests. At the beginning of each fiscal year a budget is prepared apportioning the funds available for labor, equipment, and supplies, among the different schools and departments, which are required to keep strictly within the limits of their respective appropriations. Under this policy heads of departments know in advance the exact amount of money that may be expended during the year and can plan their work accordingly, thereby securing much better results than when expenditures are authorized at irregular intervals as present conditions may seem to warrant and require. All expenditures are made upon the requisition of heads of departments,

approved by the President of the College, in accordance with the appropriations previously made by the Board of Regents.

It is required that all business of every kind whatever shall be transacted through the Business Office. A complete record is kept of all expenditures in the minutest detail, and a system of accounting has been adopted by which the condition of the different funds may be ascertained at any time.

At a meeting of the Board of Regents held on July 15, 1908, the College Book Store was established in connection with the Business Office, for the purpose of providing students with the books they require at the lowest possible cost. The Book Store is maintained without expense to the College, and books are being sold at a cost frequently as low as five per cent below the publishers' list price. Besides being a great saving to the students, it is also very convenient for them to be able to get their books at the institution as they may be needed.

Book Store
Established.

CHANGES IN COURSES.

At the meeting of the Board of Regents held on January 16, 1908, a number of important changes were also made in the courses of study. The standard was advanced one year, thereby making two years' work in a standard high school, or its equivalent, the prerequisite for admission to the degree courses. The Sub-Freshman, or preparatory, course was abolished and in lieu thereof Elementary Industrial courses were established in Agriculture, Forestry, Domestic Science and Art, Mechanic Arts, and Commerce. It was recognized that with only one year's work beyond the eighth grade required for admission to the regular college courses, it was impossible to adjust the work in these courses so that students could specialize to the extent necessary in meeting the requirements of the work for which they were preparing, or of the positions they may seek after leaving the institution. By raising the standard another year, the basic scientific work in the technical courses could be mostly completed

Standard
Advanced.

during the freshman and sophomore years, making greater specialization possible during the remaining two years. A careful investigation of the conditions throughout the State led to the conviction that the courses of the College could be extended and strengthened without removing the advantages of the institution beyond the reach of those who desire and most need the training which it affords.

Advantage was taken of the opportunity given by the advancement of the standard for a thorough revision and co-ordination of the work throughout the institution. The

**Courses
Revised.**

distinctive work of the different courses was introduced into the freshman and sophomore years and was increased and continued through the junior and senior years. By this plan,

students who are compelled to withdraw from the College at the end of one or two years will have had some work of a technical character that will be of practical value to them after leaving school. The courses in agriculture, especially, were very much strengthened through the differentiation of the different agricultural subjects.

**Opportunity for
Specialization.**

By completing the required introductory work in the different branches in agriculture during the first two years, the students are prepared at the beginning of the junior year to enter upon the advanced work of the particular line in which they may desire to specialize.

On account of the increase in the number of high schools in the State, and the improvement in their work, it was

**Sub-Freshman
Course
Abolished.**

thought undesirable and unnecessary longer to continue the Sub-Freshman course, which consisted entirely of general preparatory work in such subjects as mathematics, history, English,

etc. The abolishment of this course makes it impossible for persons to pursue at the College the general subjects only that are required for admission to the degree courses.

However, in advancing the standard of the College and abolishing the Sub-Freshman course, it was not intended

that persons who desire an education along industrial lines that cannot be had elsewhere in the State, should be deprived of the advantages afforded by the College for technical training. The main purpose in the establishment of land-grant colleges was to provide in the several states for

**Adaptation
to Needs of
People.**

an education that should be adapted to the needs of the masses of the people. And in the development of the Oregon Agricultural College, consistent with the growth of the State and of the public school system, it is important that the institution shall be kept in touch with the people—that all of its work shall be so adjusted that it will best serve them. The most advanced work offered by the College is of the very greatest importance, and should be strengthened and developed in every way possible; but, as explained elsewhere in this report, this work, under present conditions, is beyond the reach of many of the people who are most in need of industrial training. There are still many districts in Oregon without high schools, and many others in which the high school work extends through only one or two years. None of the high schools offer courses in agriculture, and very few provide any work in manual training or in domestic arts. Yet the great majority of the people of the State are engaged in industrial pursuits. They are deprived of the advantages of higher education. They need vocational training—a knowledge of the things with which they are to deal in life.

It was in response to this demand for work not provided for in other institutions that the Board of Regents estab-

**Elementary
Industrial
Courses.**

lished the Elementary Industrial courses, to which students are admitted from the common schools. These courses are strictly vocational, although as much time as possible is given to work in elementary science, and in mathematics, English, history, and drawing. Persons who complete the elementary courses, and who desire to take advanced work, may be admitted to any of the courses leading to degrees; but the

main purpose is to give such knowledge and training as will be of the greatest possible value to those who do not continue their educational work. These courses, also, in connection with the department of Industrial Pedagogy, afford the training required to teach industrial subjects in the common schools. In each course, students are allowed to take the special subjects in which they have greatest individual interest. The work in Agriculture includes such subjects as soils and field crops, irrigation and drainage, dairying, live stock, fruit growing, fruit pests, and gardening; in Forestry, elementary work relating to the Forest Service, forest production and industries, and to the management of forest properties; in Domestic Science and Art, cooking, marketing, plain sewing, millinery, dressmaking, house sanitation, hygiene, and home nursing; in Commerce, stenography, typewriting, and accounting; and in Mechanic Arts, such handicrafts as carpentry, cabinet making, blacksmithing, machine work, foundry work, steam fitting, plumbing, and electrical construction.

INDUSTRIAL PEDAGOGY.

To further assist in the promotion of industrial education, the Board of Regents established a professorship in Industrial Pedagogy. The demands throughout the State and country have rapidly increased during recent years for skilled mechanics and for men and women trained for special work in agriculture, and in home economics. As these demands have increased, it has been realized more and more that the system of public education, the work of which has been arranged in the common schools as a preparation for admission to the high schools, and in the high schools for admission to college, was not meeting the needs of the people, more than ninety per cent of whom are engaged in industrial occupations.

Professorship in
Industrial
Pedagogy.

Public
Schools
Deficient.

This deficiency was not so apparent, or so important, during the earlier periods of the country's growth, when the economic and other conditions were such that there was little demand for experts. The schools gave the general training that all desired, and the special preparation required for the "learned professions." But, as civilization becomes more complex and the demands upon the individual increase, there must be a corresponding modification in the work of the schools if they are to discharge their true function of preparing for life.

The phenomenal growth of the country during the last few decades, with the concomitant aggregation of wealth in gigantic business and industrial enterprises, and the resultant centralization of population, has wrought such mighty changes in the business, industrial, and social world that it has become imperative that all who succeed must have special training for their work—no less in the industries than in the professions. There has been a remarkable development, it is true, in technical education of college grade—along all lines of engineering, agriculture, commerce, and household technology,—but not more than two per cent of the people are able to get this advanced training; while more than ninety per cent are engaged in the different industries.

Hence the importance of providing for industrial work in the public schools, so that the children who receive in them the only schooling they ever get may have the best possible training for the vocations which they are to follow in life. The value of such work, not only to the individual but to the nation, is very clearly stated in the following paragraph from an address delivered in Congress by Senator Nelson in support of his land-grant college bill, referred to later in this report:

"Ere long the governments of the world will have expended hundreds of millions of dollars in building up a body of knowledge of agriculture and home making. Selections from this body of practical facts woven in with the literary and general subject-matter of our rural school course will

Special
Training
Required.

give life to these primary rural schools, which are not now apace with modern progress. Nothing short of the highly developed, so-called consolidated rural schools with specially trained teachers can take the rich and interesting technical education to all the boys and girls who live on the farm. *This education so increases the productive capacity of the farm youth that from this standpoint alone it will pay its own cost several times over—with better homes, better rural civilization.* * * * The welfare of the future fathers and mothers in our farm homes, as well as the welfare of our country as a whole, demands that our farm youth be better schooled both in technique and in the general subjects."

Many states are introducing industrial work into the common and high schools, but the progress being made in this direction is unavoidably slow, due in part to the expense involved, but mostly to the lack of teachers who are trained for the work. This is particularly true of agriculture. While the agricultural work given in the common schools must of necessity be elementary, yet this work requires a knowledge of the scientific principles governing plant and animal life, and of the applications of these principles in agricultural practice.

As stated by Dean Bailey of the New York College of Agriculture, in his report for 1907:

"Probably the most far-reaching educational movement now in progress is the effort to adapt the rural schools to the needs of the people. One of the great obstacles to the progress of this effort is the almost total lack of teachers who have either any knowledge of the needs of the people or a definite outlook to the work. There is great danger that the present interest in agricultural education may collapse, as similar but smaller previous movements have collapsed, unless a very active effort is made to train teachers for the work. These teachers must be trained in agricultural colleges. At Cornell we already have a beginning for the training of such teachers in our two-year nature-study course."

The United States Commissioner of Education, in his report for 1905, emphasizes the importance of providing in

the colleges of agriculture and mechanic arts for the training of teachers to give instruction in agriculture and related subjects. He says:

“If the subject of agriculture is to be introduced into the common schools throughout the country there should be at least one place in each state where teachers may be trained to give such instruction. The ‘land-grant colleges’ are undoubtedly better equipped than any other class of institutions to provide such instruction. It might be well, therefore, if additional funds are to be granted to them by the General Government, to provide that part of such funds be available for the training of teachers for the schools where elementary agriculture and related subjects are included in the course of study, particularly of teachers of agricultural subjects in high schools and state normal schools.”

Commissioner
Brown.

In accordance with this view, the Nelson Bill, which was then pending in Congress and was passed two years later, making additional appropriations to the land-grant institutions, under the terms of the Morrill Act of 1890, specially provides—

“That said colleges may use a portion of this money for providing courses for the special preparation of instructors for teaching the elements of agriculture and the mechanic arts.”

In the meantime there had been such active interest in the matter of introducing agriculture into the public schools, with comparatively little effort being made to train teachers for the work, that Dr. Brown, United States Commissioner of Education, expresses his anxiety regarding the success of the movement in the following communication, dated April 9, 1907:

“I am very much concerned with reference to the danger which I foresee of a painful shortage of teachers of agriculture. You well know that we are just now on a wave, and apparently a rising wave, of interest in agricultural education. Seven states have already provided for agricultural high schools; ten states have made provision, by law, within

a very few years, for the teaching of agriculture in the elementary schools; in nine states bills have been pending in the legislatures of the present year, providing for the extension of such teaching. At the same time there is no extensive provision making for the training of teachers for such schools. The schools simply cannot be made without the teachers. The only thing we can expect from such a state of affairs is that this rising wave will, in a few years, become a sharply receding wave; for the public will not continue to take this lively interest in agricultural education of elementary and secondary grade if they find that the subject of agriculture is much more badly taught than the other subjects in the schools.

Agricultural
Colleges
Should Train
Teachers.

"I am extremely desirous of seeing everything done that can be done to avert this danger, and to hold these recent gains for agricultural education, which seem to me in the nature of real gains for our national education. It is fortunate that just at this time the Nelson amendment to the last appropriation bill has made permissive provision for the training of teachers at the agricultural and mechanical colleges. A portion of the new funds, which amounts to five thousand dollars for each state the first year with a cumulative addition of five thousand dollars in each of the four following years, may be used for the training of teachers.*

It was in response to this demand for the preparation of teachers for industrial work in the public schools that the Board of Regents took advantage of the opportunity afforded by the Nelson Act in establishing the department of

Professorship
Established in
Industrial
Pedagogy.

Industrial Pedagogy. As already observed, the Federal appropriation, under a provision of the Nelson Act, is available for the maintenance of this department. In this work provision is made for two classes of teachers: First, those who are to teach in normal schools, high schools, and other institutions of secondary or college grade; and, second, those who are to teach in the common schools of both the city and the rural districts. The technical training required for teachers of the first class may be had in the regular college

*This communication is taken from the President's Report of Cornell University for 1907.

courses leading to degrees, provision being made for the special pedagogical work in the department of Industrial Pedagogy. It is not necessary, however, that teachers in the common schools should be college graduates. The work they require is of a more elementary character and can be had in one or two years of the Elementary Industrial courses.

After industrial work is provided for in the normal and high schools of the State, and placed in charge of competent instructors, these schools will then be able to give the special training required by those who expect to teach industrial subjects in the common schools.

In July, 1907, the Board of Regents authorized the organization of a course in agriculture to be offered during the summer vacation, in order that the teachers of the State might receive some special preparation for the use of the agricultural book which had been adopted for the seventh and eighth grades of the public schools. On account of the

**Summer
School for
Teachers.**

general demand referred to above for work in other industrial subjects, and the establishment of the department of Industrial Pedagogy, made possible by the passage of the Nelson Act, it is planned to have the work of this school cover a much broader field and extend over a period of five or six weeks. The pedagogical work will be in charge of the Professor of Industrial Pedagogy and others who might be employed to assist; while the technical work in the different subjects of agriculture, forestry, domestic science, commerce, and mechanic arts, will be given by the professors in charge of these departments of the College. The work of this school will be of special value to teachers who are unable to attend the College through the school year, but who desire to begin industrial work in their schools. It is planned also to give the teachers in the county institutes as much assistance as possible in this work. By these different agencies, it is expected that the College will be able to render very valuable service in extending the advantages of industrial education.

PURPOSE AND SCOPE.

Notwithstanding the fact that it has now been more than forty-five years since Congress took the initiative in providing for the establishment of the agricultural and mechanical colleges, there is still a lack on the part of a great many people of a perfect understanding in regard to the function and scope of these institutions, and their relation to the Federal and State governments. It is not thought inappropriate, therefore, at this time, to direct attention to some of these matters in connection with a consideration of the work and policy of the Oregon Agricultural College.

This institution was established by the State Legislature in 1868 in pursuance of an Act of Congress, approved by President Lincoln on July 2, 1862, granting public lands to

**Organic
Act of 1862.**

the different states and territories for the endowment of colleges of agriculture and mechanic arts. Section four of this Act provides that the income from the sale of the lands appropriated should constitute a perpetual fund, the income of which should be inviolably appropriated by each state—

“To the endowment, support, and maintenance of at least one college where the leading object shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, in such manner as the legislatures of the states may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life.”

Section five of the same Act provides that—

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

The State Legislature in establishing the College accepted the provisions and conditions of this Act of Congress and pledged the faith of the State to carry the same into effect. Section two of the Act of the Legislature of 1868 provides that—

State Laws.

"The students * * * shall be instructed in all the arts, sciences, and other studies, in accordance with the requirements of the Act of Congress making such donation."

Again, in Section one of the laws of 1870, it is provided that the—

"Students * * * shall be instructed in accordance with the requirements of the Act of Congress approved July 2, 1862, granting public lands to the several states and territories which might provide colleges for the benefit of agriculture and the mechanic arts, and the acts amendatory thereof."

The supplementary Act of Congress, approved August 30, 1890, for the more complete endowment and support of the land-grant colleges, provides an annual appropriation of \$25,000 to—

Morrill
Act of 1890.

"Be applied only to instruction in agriculture, the mechanic arts, the English language, and the various branches of mathematical, physical, natural and economic science, with special reference to their applications in the industries of life, and to the facilities for such instruction."

The Act of Congress making appropriations for the United States Department of Agriculture for the fiscal year ending June 30, 1908, approved March 4, 1907, contained what is known as the Nelson Amendment—which was a bill then pending in Congress providing for the further endowment of land-grant institutions, but was inserted as an amendment to the Agricultural Bill as a means of securing its passage at that time. Under this amendment there is annually appropriated—

"For the more complete endowment and maintenance of agricultural colleges now established, or which may hereafter be established, in accordance with the Act of Congress approved July 2, 1862, and the Act of Congress approved August 30, 1890, the sum of five thousand dollars, in addition to the sums named in the said act, for the fiscal year ending June 30, 1908, and an annual increase of the amount of such appropriation thereafter for four years by an additional sum

Nelson
Amendment.

of five thousand dollars over the preceding year. * * *
 The expenditure of the said money shall be governed in all respects by the provisions of the said act of Congress approved July 2, 1862, and the said act of Congress approved August 30, 1890; *Provided*, That said colleges may use a portion of this money for providing courses for the special preparation of instructors for teaching the elements of agriculture and the mechanic arts."

It will be observed that the appropriations under the Nelson Act are available for all the purposes specified in the Morrill acts, with the proviso only that part of the funds may be used for the training of teachers.

The different Congressional acts are administered on behalf of the Federal Government by the Department of the Interior. As interpreted by the Department, in accordance with the decisions of the Attorney General, the funds accruing from these acts cannot be used for the purchase of land, or for the purchase, erection, or maintenance of buildings; for the payment of the salaries of administrative officers, or of instructors in any subjects not specified, such as history, psychology, and the languages, except English; or for the purchase of furniture, cases, desks, or other similar articles of equipment. It was expected by Congress that these funds should constitute only part of what would be needed, as an assistance and encouragement to the several States in providing such institutions as may be required for the proper education of the "industrial classes." As explained by Dr. Blackmar, in his History of Federal and State Aid to Higher Education,

Obligation
of State.

"The Federal Government intended the grant should form a nucleus in each of the several states around which buildings, libraries, laboratories, workshops, gymnasiums, military halls, and other educational appliances should be grouped by means of public munificence and state bounty. It was to prove a stimulus to the generosity of the people and the liberality of the states."

The extent and character of the work for which the Federal appropriations are available are clearly indicated

in the following classification of subjects included under the Act of 1862 and the supplementary Act of 1890, given in an official communication of the United States Commissioner of Education, approved by the Secretary of the Interior on December 7, 1900:

Subjects
Classified.

"Instruction in Agriculture.—(1) Agriculture, (2) Horticulture, (3) Forestry, (4) Agronomy, (5) Animal Husbandry, (6) Dairying, (7) Veterinary Science, (8) Poultry Industry, (9) Apiculture.

"Instruction in Mechanic Arts.—(1) Mechanical Engineering, (2) Civil Engineering, (3) Electrical Engineering, (4) Irrigation Engineering, (5) Mining Engineering, (6) Marine Engineering, (7) Railway Engineering, (8) Experimental Engineering, (9) Textile Industry, (10) Architecture, (11) Machine Design, (12) Mechanical Drawing, (13) Ceramics, (14) Stenography, (15) Typewriting, (16) Telegraphy, (17) Printing, (18) Shop Work.

"Instruction in English Language.—(1) English Language, (2) English Literature, (3) Composition, (4) Rhetoric, (5) Oratory.

"Instruction in Mathematical Sciences.—(1) Mathematics, (2) Bookkeeping, (3) Astronomy.

"Instruction in Natural and Physical Sciences.—(1) Chemistry, (2) Physics, (3) Biology, (4) Botany, (5) Zoology, (6) Geology, (7) Mineralogy, (8) Metallurgy, (9) Entomology, (10) Physiology, (11) Bacteriology, (12) Pharmacy, (13) Physical Geography, (14) Meteorology.

"Instruction in Economic Sciences.—(1) Political Economy, (2) Domestic Economy, (3) Commercial Geography."

After a number of different states had established colleges under the land-grant, many difficulties were encountered in the development of the agricultural work in these institutions. This was partially due to the lack of trained teachers for the work, but largely to

Experimental
Work
Required.

the deficiency of knowledge of the scientific principles underlying agricultural practice.

The Morrill Act of 1862 related to the work of instruction only, or to the dissemination of knowledge. No provision was made for experimental or research work for the purpose of discovering new truths or of determining

an effective means of applying the principles already understood. In order, therefore, "to promote scientific investigation and experiment regarding the principles and applications of agricultural science," Congress passed what is known as the Hatch Act, approved March 2, 1887, appropriating \$15,000 annually for the maintenance of an agricultural experiment station in each of the land-grant colleges. Section two of this Act provides—

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

**Hatch
Act 1887.**

On March 16, 1906, Congress passed an Act for the further endowment of the experiment stations. This Act makes an appropriation to each state and territory, which will eventually amount of \$15,000 annually,

**Adams
Act 1906.**

"To be applied only to paying the necessary expenses of conducting original researches or experiments bearing directly upon the agricultural industry of the United States, having due regard to the varying conditions and needs of the respective states and territories."

The administration of this Act, known as the Adams Act, is placed in the hands of the Secretary of Agriculture, who has ruled that—

"Expenses for administration, care of buildings and grounds, insurance, office furniture and fittings, general maintenance of station farm and animals * * * and other general expenses for the maintenance of the experiment station, are not to be charged to this fund. This Act makes no provision for printing or for the distribution of publications, which should be charged to other funds."

"The increased liberality of the Federal Government," says Secretary Wilson, "in providing for the endowment of research and experimentation in agriculture should be a further incentive to the States and local communities to supplement these funds for the extension of demonstration experiments, farmers' institutes, agricultural colleges, schools, and courses of instruction, and the general education of the rural communities along industrial lines, in order that the masses of our farmers may be so educated from early youth that they will appreciate the benefits of original research and experimentation as applied to agricultural problems, and be able to appropriate in the most effective manner for their own benefit and the general welfare of the nation whatever practical results are obtained from the work of the agricultural experiment stations."

From a careful examination of the organic act of 1862, and the acts supplementary thereto, it is evident that the work of the land-grant colleges should cover a broad field, including the different subjects of applied science and the general training that constitutes an essential part of a liberal education. As stated by Senator Justin S. Morrill, author of the acts of 1862 and of 1890:

"The object of the Act of 1862 was to give a chance to the industrial classes of the country to obtain a liberal education, something more than was bestowed by our universities and colleges in general, which seemed to be based more on the English plan of giving education only to what might be called the professional classes—in law, medicine and theology." The fundamental idea was "to offer an opportunity in every state for a liberal and larger education for larger numbers; not merely to those destined to sedentary professions, but to those much needing higher instruction

for the world's business, for the industrial pursuits and professions of life."

The general purpose in view, therefore, in the establishment of the colleges of agriculture and mechanic arts was to promote the *liberal* and *practical* education, primarily of the industrial classes—to apply science in the industries of life. The laws under which these institutions are maintained place special emphasis on the technical or distinctive work along the different lines of agriculture, the mechanic arts, commerce, and home economics, as well as the related subjects of mathematics and the natural and physical sciences. Classical subjects are not excluded, and military tactics is required. The subjects that constitute an essential part of the *liberal* education contemplated in the organic act, include sufficient English to give a reasonable degree of accuracy and facility in the use of the mother tongue and some appreciation of standard literature; the history and political science necessary for a comprehensive understanding of the origin and development of industrial, political, and social institutions; and such knowledge of modern language as may be needed to keep in touch with the scientific development of at least one foreign country.

Subjects of
Liberal
Education.

The classification of the distinctive technical work provided for in the Morrill Act includes, in Agriculture, such subjects as agronomy, horticulture, animal husbandry, forestry, dairying, poultry husbandry, veterinary science, and apiculture; in Mechanic Arts, the different lines of engineering—mechanical, civil, irrigation, electrical, mining, experimental,—besides architecture, machine design, mechanical drawing, shop work, printing; in Domestic Science and Art, the various subjects of cookery, home sanitation, household art, dressmaking, millinery; and in Commerce, such subjects as trade and transportation, business administration, production and manufacture, business organization and management, accountancy, stenography, and typewriting.

Distinctive
Technical
Work.

It will be observed that the terms of the organic act are definite and positive in regard to the character of the institutions that would fulfill the objects of the law, but are sufficiently broad to permit such modification in matters of detail as may be required to meet the varying needs of the rapidly growing country. At the time of the passage of the second Morrill Act, however, the economic and other conditions throughout the United States were such that, with the crystalization of policy in the management of these institutions that had resulted from the experiences of the preceding two decades, it was possible to specify the work more in detail, even to the extent of naming the subjects, that should be provided for by the funds accruing from the Federal appropriations.

A careful consideration of the subject of technical education, and of its importance in conserving and developing the natural resources of the country, will show that the entire plan of land-grant college work is most ideal and comprehensive, including the subjects required in training for good citizenship, as well as for industrial efficiency in any of the great fields of production, manufacture, and commerce. There is a vital inter-dependence of the agricultural, engineering, commercial, and other distinctive work, that makes for unity, efficiency, and mutual helpfulness. The development of agriculture depends not only upon the application of scientific principles in the production of crops, but also upon a demand for farm products, and an easy and economic means of transporting them to market. Under present conditions, adequate transportation facilities constitute a most essential factor in the growth of agriculture. An increase in transportation facilities, by the improvement of highways and inland waterways, and by the extension of railroads, must precede, or accompany, any great agricultural advancement. Other important factors are the construction of factories for the manufacture of the most improved farm machinery

Inter-dependence
of Technical
Courses.

Development of
Agriculture.

and implements, and of the different articles made from the products of the farm; the utilization of water power for manufacturing and transportation; and the manufacture of structural steel and cement used in building cities, thereby increasing the demand for farm products. On the other hand, there can be no great progress in building factories, railroads, and cities, except through a corresponding development of agriculture and forestry. Factories must have the raw material required, and a market for their products;*

**Factories,
Railroads,
Cities.**

transportation lines go only where the movement of commodities warrants; while the growth of most cities at least is dependent alike upon the prosperity of both the farmer and the manufacturer. Then, again, the combined efforts of engineers and agricultural experts are required in the drainage of swamp lands, and in the reclamation of large arid tracts by irrigation; while success in any modern enterprise is possible only through the application of business principles. Special training in business methods is as essential in agriculture, in manufacturing, and in transportation, as it is in merchandising. Moreover, the prosperity and civilization of a country depend upon the character of its homes, and the modern home requires special training in the sciences and arts relating to home life.

**Business
Principles
Applied.**

Furthermore, aside from the economic value of land-grant college work in promoting state and national development, the subjects which are comprised in the curricula of these institutions have the greatest possible educational or disciplinary value.

**Disciplinary
Value.**

While it has not been many decades since the classics and the pure sciences were regarded as the only subjects for mind training, it is now fully recognized that the applied sciences, which combine thinking with doing, taught by competent instructors, with suitable equipment,

*Agricultural products constitute 42 per cent of all materials employed in manufacturing in the United States.—Year Book, Department of Agriculture, 1905, page 15.

have a disciplinary value not surpassed, if equaled, by the old style college course.

It is apparent, therefore, that, considered from all points of view, the different courses in agriculture, engineering, commerce, and household technology, maintained co-ordinately as the distinctive features of land-grant college work, together with the related scientific and general subjects, constitute a unity and completeness of educational endeavor peculiarly adapted to the needs of American industry and of American life.

There are sixty-five land-grant institutions. Each State and Territory, except Alaska, has at least one, while sixteen Southern States maintain separate schools for colored persons. In 1907, as reported by the Office of Experiment Stations, U. S. Department of Agriculture, these institutions had permanent funds and equipment aggregating in value \$96,234,000; and an income for that year, exclusive of experiment stations, of \$14,560,000. Of this income, \$2,073,000 was received from the Federal Government under the

Land-grant
College
Statistics.

acts of 1862 and 1890, and \$7,844,000 from the several States, the remaining \$4,643,000 being the interest from endowments, and the amounts received in student fees and from miscellaneous sources. The value of the permanent endowment and equipment is increasing at the rate of about \$5,250,000 a year. The number of professors and other instructors in the colleges and universities for white persons was 5,145, and of students 59,485. The total number of students in agriculture was 9,777; in engineering and mechanic arts, 16,999; in domestic science and art, 1,597. Of these, there were in the degree courses in agriculture, 4,138; in engineering, 16,330; in household economy, 1,047; and in the short courses not leading to degrees, in agriculture, 5,639; in mechanic arts, 669; in domestic arts, 550. The number of men in military tactics was 16,048.

The experiment stations had an income of \$2,235,000, of which \$1,056,000 was received from the Federal Govern-

ment, \$770,000 from the different States, and the balance from miscellaneous sources. They employed 1,098 persons, of whom 484 did work as teachers in the colleges with which the stations were connected.

In connection with the above, it is interesting to note that in 1896-1897, the number of professors and instructors in the faculties of the institutions for white persons was 1,472, and the number of students 25,069; while the aggregate value of permanent endowments and equipment was \$51,275,000, and the income for the year from all sources was \$5,178,000, of which \$1,620,000 was received from the National Government. The total revenue of the experiment stations for the same year was \$1,130,000, of which \$720,000 was received from the United States under the Hatch Act.

While the colleges of agriculture and mechanic arts made comparatively slow growth during the first two or three decades, the development of these institutions during the past ten or fifteen years has been most remarkable, not only in the work directly accomplished along technical lines, but also in the influence they have exercised in shaping the general educational policy of the country. As stated by Senator Nelson in advocacy of the passage of the Nelson Bill, previously referred to in this report,

"It is not too much to say that through the Morrill Act of 1862 and subsequent acts, Congress has wrought a revolution in American education as well as in American agriculture. The old educational ideals * * *

The Old and New Education. have slowly given way to the far broader ideals for a system of public education suited to the needs alike of workers, business men, home makers, technicians, and professionals. The new education while retaining the high moral and ethical ideals of the old, combines with these substantial training in doing the things of every day life."

As an indication of the directions in which the agricultural colleges have been developing, of the work they have already accomplished, and of their importance in promoting

both national and state interests, Senator Nelson is further quoted as follows:

"The agricultural departments of our State colleges are recently having a most substantial development, and from them is springing a brood of agricultural high schools and a still larger brood of consolidated rural schools. * * *

Agriculture These courses have become so universally suc-
Developed. cessful that even conservative educators of the
 old school acknowledge that the new education
 initiated by Congress in 1862 is destined to
revolutionize country life and the rural industries.

* * * * * * * * *

"These land-grant colleges have influenced the non-agricultural industries to nearly as great a degree as they have improved agriculture. The engineering courses in these colleges have supplied a large share of the men who have made it possible to develop our vast systems of transportation and manufacturing and to erect our great cities. They have provided a large body of teachers of the science and technique of the industries and of home economics for the other schools. They are the forerunners of the city

Importance of mechanic arts high school, and of the introduc-
Engineering. tion of industrial and manual training subjects
 into city grade schools. * * * The degree
 to which we, as a nation, shall distance other
nations in manufacture, if not indeed in the development of transportation and in the erection of cities, will in no small part depend upon the rounding out of the technical education of those who are to work in our mechanical industries. The use of federal funds to enable the engineering departments of our land-grant colleges to lead onward and upward in this educational movement has in every way proved justifiable.

* * * * * * * * *

"These same colleges have also done the country a pronounced service in inaugurating instruction in home economics. This relatively inexpensive line of teaching is now rapidly extending from the State colleges into all other colleges, secondary schools, and primary schools wherever girls are taught separately or in co-educational institutions. This

Home
Economics.

one line of instruction alone is of vastly greater value than the total cost to the nation and States of all these colleges.

* * * * *

"We have no institutions better adapted to build up true American citizenship than our agricultural and mechanical colleges, where literary, ethical, scientific, industrial, and military training are blended into a strong, sensible, inspirational scheme of education. Congress did wisely in establishing them, and as this great nation grows in power and in wealth it should further recognize them and build them up."

In this great work of industrial education, the Oregon Agricultural College is in harmony with the spirit and policy of the best land-grant institutions of the country. Its function and scope are clearly indicated in the provisions of the Federal and State laws under which it is maintained. It is the purpose of the College to meet the needs of the people for a "liberal and practical education," and to promote the development of the varied resources and industries of the state.

The College offers the following courses: Degree courses in Agriculture, Forestry, Domestic Science and Art, Civil Engineering, Electrical Engineering, Mechanical Engineering, Mining Engineering, Commerce, and Pharmacy, each extending through four years; elementary industrial courses in Agriculture, Forestry, Domestic Science and Art, and Commerce, each extending through two years; winter courses in General Agriculture, Dairying, Horticulture, Mechanic Arts, Surveying and Road Construction, and Domestic Science and Art; a summer course for teachers, extending through six weeks; and courses in Music, including voice, piano, violin, stringed instruments, and band.

Function
and Scope
of O. A. C.

Courses
Offered.

AGRICULTURE.

As explained elsewhere in this report, under Organization and Changes in Courses, the agricultural work of the College has been extended and very much improved during the past two years. The departments of Agronomy, Animal

Husbandry, Dairy Husbandry, Horticulture, Poultry Husbandry, and Entomology, are now maintained with a full complement of professors, instructors, and assistants. The department of Veterinary Science has been established, but for lack of funds has not been organized. The progress that has been made in the development of the agricultural work, the courses offered, the increase in the number of students pursuing the different subjects, the present conditions, and the requirements for the next biennium, are given in detail in the Appendices.

As shown in the report of Dean Cordley, the total enrollment of students in Agriculture for 1906-1907 was 136, of whom 80 were in the degree course and 56 in the short winter courses. All of the instruction was given by three men whose time was largely required in the work of the Experiment Station and of the farmers' institutes. Of the 285 term credits necessary for graduation from the regular course, only 40 credits, or 14 per cent, were required in agricultural subjects. In 1907-1908 two professors and one instructor were employed, increasing the teaching force from three to six. The attendance for this year had increased to 179, exclusive of the summer school students in Agriculture. Of these, 109 were in the regular work of college grade, and 70 were in the short winter courses. The number of courses were increased from 10 to 50, and the number of term credits from 40 to 169, the proportion of the agricultural work in the degree course being increased from 14 per cent to 51 per cent.

Up to December 1, 1908, the number of students registered for the regular work exceeded by more than 53 per cent the total registration for the same work of the preceding year. During the present year, the instructing force has been increased from six to ten. There are offered a total of 83 courses in agricultural subjects, aggregating 243 semester credits. Sixty-eight of the 144 semester credits required for

School
Statistics.

Instructors
and Courses
Increased.

graduation from the course in Agriculture, or approximately 57 per cent, may be taken in agricultural subjects.

It will be observed, therefore, that the increase in the number of students pursuing regular agricultural work in 1907-1908 over 1906-1907 was 36 per cent; and on December 1, 1908, the enrollment was 53 per cent over 1907-1908, and 111 per cent over 1906-1907. It will also be observed that the increase in the actual amount of agricultural work given has been far greater even than the increase in attendance, the increase in the work offered for 1907-1908 being 400 per cent over the preceding year; and for 1908-1909, upwards of 900 per cent. Besides the increase in the number of agricultural subjects given, it may be noted that there has also been a large increase in the amount of work offered in the basic subjects of bacteriology, botany, physics, chemistry, and zoology. These figures show a growth that is without parallel, so far as known, in the development of agricultural education in this country.

Phenomenal
Growth.

In order to insure efficient work in the various departments of Agriculture, particularly in view of the large increase that will undoubtedly continue in the number of students pursuing agricultural subjects, it will be necessary to provide for a number of additional instructors, for more extended equipment, and for additional room. As stated by Dean Cordley, in his report to the President:

"Notwithstanding the fact that the instructing force in Agriculture has been increased during the biennium from three to ten persons, and that to the facilities for instruction have been added a well equipped poultry plant, a splendid agronomy building which contains some of the best equipped laboratories for work in agronomy to be found in the country, and an attractive and well equipped dairy barn, the increase in the facilities for instruction has not kept pace with the development of the work. The room available for instruction purposes has approximately doubled, the teaching force has trebled, while the amount of instruction given has increased nine-fold."

The department of Agronomy offers fourteen courses, including the different subjects of soils, crops, irrigation and drainage, farm mechanics, and farm management. The work of this department, therefore, covers a broad field, and is fundamental to a large part of the work of the other agricultural departments. In addition to the advanced work elected by those who desire to specialize in agronomy, general elementary courses are required in the Freshman and Sophomore years of all students in the course in Agriculture. During the present year, 13 different courses are being given in seventeen sections, aggregating 47 semester hours, with a total of 323 class units. All this work is given by the Professor and one instructor, who also devote a large part of their time to the work of the Experiment Station and the farmers' institutes. With the increase in the amount of work required in Agronomy, it will be necessary next year to employ at least one additional instructor. The new Agronomy building contains the necessary laboratories, class rooms, and offices for the work of this department, except in agricultural mechanics. This work is now being given in the west wing of the new barn; but, as the work in Dairy and Animal Husbandry increases, all of the room in the barn will be required for these departments, when other arrangements will have to be made for the work in agricultural mechanics. For this work, upwards of \$5,000 worth of the most modern farm machinery has been loaned to the department by different dealers or manufacturers; and, as explained by Professor Scudder, as soon as adequate provision is made for its care, at least "\$10,000 worth of such machinery can be secured at no cost to the institution, making the equipment of this department superior to that of any other institution west of Missouri, and equal to that of any other in the country." Some additional equipment will be required for the other subjects in Agronomy as listed in the Depart-

Department
of Agronomy.

Farm
Mechanics.

mental Estimates of Requirements, given in the Appendices.

The department of Horticulture is one of the largest and most important agricultural departments of the institution. It is now offering 33 different courses, covering the entire field of general horticulture, floriculture, and vegetable gardening. In addition to the winter-course work, 12 different courses were given during the year 1907-1908, with a total of 266 students in all of the classes. The work and the number of students for the present year are about 50 per cent greater than for the preceding year,

Department of
Horticulture.

and it is estimated by Professor Lewis that during the next biennium 28 different courses will be given with a total class registration of 475

and 660 for the first and second years respectively. If Mr. Bouquet, who is now on leave of absence, should resume his work at the College at the beginning of next year, the instructional force will be sufficient. But this department is practically without room for its work. At present it is using the small frame structure near the power plant, which is not only unsuitable for the work, but is entirely inadequate, having scarcely sufficient room for the offices. The small

Additional
Room
Required.

glass houses adjoining this building are not large enough to meet the demands of the campus. For the laboratory work along certain lines of horticulture, extensive greenhouses are

required. There should also be storage rooms, pomological laboratory, grafting laboratory, general laboratory, spraying laboratory, station laboratory, drafting room, photographic room, and rooms for the horticultural museum, and the herbarium; besides offices for both the instructional and the station work, and class rooms for the different instructors.

The growth and importance of the department of Horticulture, make it necessary that provision be made at once for the construction of a suitable building for this department. The general plan of the new agricultural building, submitted to the Board of Regents at its meeting last Janu-

ary, provides for the use of the south wing for the horticultural work. The building, 72 feet by 140 feet, three stories in height, would contain the room required for the work in Horticulture, and, temporarily, some additional room that could be used by other departments. It is planned to have the greenhouses extend south of the horticultural building; and, by providing for the use of the land near by for the floricultural and vegetable gardens, an ideal plan can be carried out for the development of the horticultural work. As soon as practicable it is also important that additional land be procured for both the instructional and the experimental work in horticulture. On this subject, Professor Lewis says:

“More land is sorely needed by the Horticultural department. At the present time our permanent land consists of only five acres. This, I believe, is the smallest area for horticultural purposes used by any college or station in the United States. Hardly any station that is doing horticultural work at all has less than thirty acres for such purposes. It would be very desirable to buy the Meeker property, which would give us an orchard in full bearing and also land for the starting of new orchards along commercial lines. In addition to this, a small piece of land should be set aside near the horticultural building to be used as floricultural and vegetable gardens for class purposes, and land for growing stock plants for greenhouses.”

There has been a large increase in the amount of work called for during the past two years in the different subjects of Animal Husbandry, and in the number of students pursuing work in this department. It is estimated that for the next biennium the number of credit hours will average about 56, and that the number of students taking the regular work will reach at least 200. This will make it necessary to provide another instructor, additional equipment, and more room. As reported by Dr. Withycombe:

"The real needs of the department are, first, more first-class live stock; second, for the years 1909 and 1910 additional class room and another instructor; third, a judging pavilion. This last expense can be deferred for

Live Stock
Needed.

a time, but such a building would greatly add to the convenience and attractiveness of the work.

By far the greatest present need is more live stock. The College and Station has a good herd of Jerseys and Shorthorns, Yorkshire and Berkshire swine, and a good flock of Cotswold and Shropshire sheep. But for thorough work in animal husbandry there should be a greater number of breeds represented so that students can have a much wider range of work and thus become familiar with practically all of the leading breeds of live stock."

Eleven different courses are now offered in Dairy Husbandry. With the growth of the dairy industry of the state, there has been a corresponding increase in the interest taken in the work of this department of the College. To take care

Dairy
Husbandry.

of the work, it has been necessary to employ an additional instructor for the second semester of the present year, and still further assistance will be required during the next biennium.

Dairying is one of the leading agricultural industries of the state; but, with the climatic and other local conditions so favorable, the growth of this industry should be much more rapid in the future than it has been in the past. Before there can be any very great development, however, it is necessary that the dairymen follow more up-to-date scientific methods in their work. In proportion to the extent that they do this will the supply of milk, butter, and cheese be increased. Secretary Wilson of the U. S. Department of Agriculture estimates that "one-fourth of the cows of the country do not pay for their feed, and more than half of them do not return any profit." Before the dairy industry can be

Eliminate
Unprofitable
Cows.

placed on a stable, profitable basis, the dairymen must eliminate the unprofitable animals from their herds. This is not impossible of

accomplishment; it is simply a question of education. As the importance of this is realized, there will undoubtedly be

a much greater demand for instruction in dairying at the College. To meet this demand it is necessary that the department of Dairy Husbandry be provided with better and more extended facilities for its work. The present rooms answer fairly well for the work in certain subjects; but, as explained by Professor Kent, the close proximity of these rooms to the chemical laboratories, and other unfavorable conditions, make it impossible to meet the requirements of the winter course students, and of others who are pursuing advanced work and desire to specialize along the lines of commercial dairying. Besides, these rooms are now too

Dairy
Building
Needed.

small for some of the larger classes, and as the number of students in dairying increases, it will be still more difficult to do the work in the present quarters. It is important that the dairy division of the proposed new agricultural building be completed as soon as possible, in order that there may be adequate and proper facilities for the most up-to-date work in this department.

The Professorship in Poultry Husbandry was established but a year and a half ago. Nearly a year's time was required to complete the equipment for the poultry work, so there has been very little instruction in this subject, except to winter course students. A class was organized at the beginning of the present year for a number of persons who are specially interested in poultry culture, and students have

Poultry
Husbandry.

registered for regular work during the second semester. On account of the importance of the poultry industry, there will no doubt be a strong demand for instructional work in this department. The department is provided with the incubator house and other buildings and improvements required in the experimental work, and these are also used to some extent for class purposes. But before satisfactory instructional work can be given, it will be necessary to have rooms for handling and judging fowls, for storage of eggs, for laboratory or practical work in designing and constructing poultry houses and appliances, and for dressing and packing fowls for ship-

ment. The office and class rooms should be in the new agricultural building. The other work can be provided for in the frame building used at present by the department of Horticulture. This building can be moved to the poultry grounds and remodeled at small expense so that it will be well adapted to the needs of the Poultry department.

In 1907, when the agricultural work was segregated, the subject of veterinary science was taught in the department of Agriculture. Since that time it has been given in the department of Animal Husbandry. The work in animal husbandry covers a broad field in itself; and, while specialists in this department must have a general knowledge of the common ailments of domestic animals and of the remedies therefore, they cannot be expected to be specialists in veterinary science, prepared to train men for work as practitioners. But even if they were, a division of time between animal husbandry and veterinary science would

Demand
for Veterinary
Science.

make successful specialization in either of these departments impossible. The live stock interests of the state have assumed such magnitude, and the annual loss from diseases is so great, that it is of the utmost importance that provision be made at the College at the earliest date possible for a complete course in Veterinary Science. In discussing this question Dean Cordley says:

"During the past two years a number of students have applied for registration in a course in Veterinary Science. In view of the great importance of the live stock and dairy industries to the State, and particularly in view of the rapid increase in the number of highly bred animals in the State—animals which it is to the State's interest to protect,—I believe provision should be made at once to organize a course in Veterinary Science at this institution."

In his report for 1907, Secretary Wilson gives the number of live stock in Oregon, exclusive of goats, as 4,441,000, with an aggregate value of \$57,739,000. To prevent the spread of contagion and otherwise to reduce loss from dis-

eases among the live stock, a large number of practicing veterinarians are required throughout the different counties of the state. To meet this demand, which is becoming greater every year, students are applying for veterinary work at the College, and there should be no delay in providing for this important line of agricultural education. It would not seem feasible, or necessary, to provide at once for a degree course in Veterinary Medicine; but the equipment should be provided and a professor employed for the work of the department. Students pursuing the regular course in Agriculture could then elect veterinary science as a major during the junior and senior years, and this work with the necessary minor studies would give them the training required to meet present demands. But with the development of the live stock industry of the State, there will no doubt be a corresponding increase in the number of students who will desire veterinary science and it will be necessary to extend the work, and within a few years at most to establish a regular course leading to degrees.

A recent investigation shows the importance of veterinary work not only as a means of reducing the loss from diseases among live stock, but also of protecting the health of the people. In an address delivered at the Inter-National Congress on Tuberculosis in October, 1908, Dr. A. D. Melvin, Chief of the Bureau of Animal Industry of the U. S. Department of Agriculture, stated that of the 400,000 cattle that had been tested by Federal and State officials with tuberculin prepared by the Bureau of Animal Industry 37,000, or 9.25 per cent, re-acted. On an

Loss from
Tuberculosis.

average, he says, ten per cent of the milch cows of the country are affected with tuberculosis.

The estimated loss among cattle and hogs alone from this one disease, including the depreciation in the value of milch cows, decrease in market production, and impairment of breeding qualities, aggregates at least \$14,000,000.

From reports received from different parts of Oregon, there is no doubt that tuberculosis exists to a great extent

among the live stock, particularly the dairy cattle. Some reports state that from ten to twenty per cent of the cows from which milk is obtained are affected with tuberculosis. According to Dr. Melvin's estimates of the loss by depreciation in the value of milch cows affected with tuberculosis, the loss to this State from the dairy cattle alone aggregates the enormous sum of nearly one hundred thousand dollars annually.

During the year 1905, the Pennsylvania State Department of Agriculture inspected 733 herds of cattle and condemned 1,352 animals with tuberculosis. The Department in speaking of its investigation says:

"The need for the repression of tuberculosis is two-fold: In the first place, the disease is a very wide-spread affection of cattle and destroys great quantities of property every year. * * * In the second place, tuberculosis is of importance with relation to public health."

Speaking of the special investigations on tuberculosis by the Bureau of Animal Industry, Secretary Wilson, in his report for 1907, explains—

"That the frequency with which tuberculosis occurs as a lung disease justifies the conclusion that the lung is not always infected directly through the air. The work of the year also demonstrates," he continues, "that the commonest mode for the discharge of tubercle bacilli from the bodies of tuberculous cows is with their feces, that about 40 per cent of the tuberculous cows that show no outward symptoms are expelling and scattering tubercle bacilli and that tubercle bacilli passed with the feces of tuberculous cows are actively pathogenic. When it is borne in mind how frequently milk contains cow feces, and that the percentage of dairy cows known to be tuberculous is considerable, the facts presented seem to warrant the conclusion that tuberculous cows are responsible in a great measure for the prevalence of tuberculosis in the human family."

Tuberculous
Cows Source
of Infection
to Man.

An investigation was made in the District of Columbia during 1907, and the tuberculosis test was applied to thirty-seven herds with 658 cattle, of which 118, or 18 per cent,

were found to be tuberculous. Secretary Wilson also states that an—

“Examination of the sediment taken from the cream separators of public creameries throughout the country has demonstrated the presence of tubercle bacilli in about one-fourth of the samples.”

In Bulletin No. 93, U. S. Department of Agriculture, issued in 1906, Dr. Schroeder and Dr. Cotton give an account of extended experiments in relation to tuberculosis and the mode of infection, and conclude with this statement:

“It seems from this array of facts, every one of which is based on positive experimental evidence, that we should feel no doubt regarding our plain duty, which is, no matter what other measures we adopt in our fight against tuberculosis, not to neglect one of the chief, if not the most important, source of infection—the tuberculous dairy cow.”

And again, in special circular No. 127, on Tubercle Bacilli in Butter, issued in 1908 by the same specialists, paragraph seven of the summary is as follows:

“Unimpeachable evidence proves conclusively that tubercle bacilli of the bovine type, from bovine sources, must be classed as highly infectious for man; hence, tubercle bacilli in butter cannot be ignored because they are usually derived from bovine sources.”

A series of independent investigations have been made contemporaneously by Dr. Mohler and Dr. Washburn of the

Pathological Division of the Bureau of Animal Industry, and in bulletin No. 96, issued in 1907,

Independent Investigations. containing an account of these investigations.

it is explained that it has been shown decisively that tubercle bacilli of the bovine type will produce the disease in man. One of the conclusions is stated thus:

“There is a certain proportion of cases of human tuberculosis in which may be found tubercle bacilli which are pathogenic for cattle.”

An investigation of this question has been made in different countries, particularly in Germany and England. It is reported that of the number of—

“German cases investigated, one-seventh, and of the English cases about one-third, were caused by bacilli of the bovine type * * * It is clearly established that the important point is that the same kind of tubercle bacillus that produces disease in cattle may also produce disease in men. Upon this point there seems to be no room for difference of opinion.”

Referring to the discussion at the recent Tuberculosis Congress, the American Medicine (Philadelphia) says that—

“The great majority of scientific students of tuberculosis firmly believe that bovine and human types of the disease are interchangeable, and there are good reasons for this opinion.”

There can be no possible doubt in regard to the extent to which the live stock of the country are affected with tuberculosis and the immense losses resulting therefrom. However, there are many people—among them eminent scientists—who disagree with the conclusions indicated above in regard to the inter-changeability of the bovine and human types of the disease. But whatever differences of opinion there may be in regard to this particular question, the results of the extensive and disinterested investigations that have been made both in this country and in Europe leave no doubt as to the importance of using every possible precaution against the transmission of the disease to man.

Although undoubtedly the worst, yet tuberculosis is only one of the many diseases from which the live stock industry is suffering heavy annual losses. Such other diseases as black-leg, glanders, mange, cerebo spinal meningitis, influenza, distemper, fluke, are more or less prevalent throughout the State. The control and eradication of contagious diseases are of the very greatest importance and can be effected only by the enforcement of a rigid system of inspection and quarantine. The use of preventives, such as vaccine for black-leg in cattle; and of diagnostic materials, such as tuberculin for tuberculosis in cattle and mallein for glanders in horses, is

Other
Diseases.

now saving millions of dollars annually to the country. And this amount would be increased many fold if there were a sufficient number of trained veterinarians in the field to do the work. In Oregon it is the duty of the Agricultural College to train the men required.

To arrange for the veterinary work at the College, in the way referred to above, there will be required an office, a class room, a laboratory, and hospital stalls, with the necessary equipment of instruments. The stalls could be provided for in one of the old barns at comparatively small cost. The entire cost of this work, including the salary of the professor, will amount to from \$3,000 to \$4,000 a year.

Irrigation and drainage is another important line of agricultural work that should receive consideration. Large tracts of land are now being reclaimed by irrigation, and many thousands of acres of other lands can be reclaimed or very much improved by drainage. In addition to the lands in Eastern and Southern Oregon now under irrigation, and other tracts that will be reclaimed under the Government projects and by private enterprises, there can no longer be any doubt as to the value of irrigation in many parts of the Willamette Valley. In some sections of the State where irrigation is being practiced, the low lands are becoming water-logged through seepage and alkali is rising to the surface, rendering practically valueless large tracts that had formerly been very productive. The only way to reclaim such lands is by drainage. For this important work special training is required. While the department of Agronomy has done very valuable work in irrigation and drainage, the conditions are now such that a special department should be established for this work.

In several of the land-grant institutions a department of rural engineering is maintained which comprises the work along the different lines of irrigation and drainage and agricultural mechanics, including such subjects as field machinery, farm power machinery, fences, farm roads; but,

on account of the extensive area of Oregon and the magnitude of the work in irrigation and drainage, all the time of one man at least would be required in this particular work, and better results would certainly be achieved than if the time of the professor should be divided between the two departments. By establishing a department of Irrigation and Drainage the professor in charge could not only take care of the work at the College, but could render very valuable assistance in experimental and extension work in different parts of the state. Very little expense would be involved, except for the salary of the professor.

As soon as conditions will warrant, though it may not be feasible at this time on account of the expense, a professorship should also be established in industrial or rural economics. The work of this department would include different subjects connected with economic problems of agriculture, such as agricultural methods, farm finances, cost and relative profits of different farm operations, exports, ownership, taxes, land laws, organizations, and the relation of agriculture to other industries. A specialist in charge of this department could give work especially adapted to the requirements of students in the different courses; and, by research and investigation, could render service that would be of great value in the general work of economic improvement throughout the state.

Industrial
Economics.

EXPERIMENT STATION.

All members of the faculty who are heads of departments of agriculture are also members of the Experiment Station Staff, and have charge of the corresponding work of research and experimentation. Therefore what has been said in a former section of this report of the establishment of professorships in agriculture and of the resulting extension and strengthening of the instructional work, is also true of the

Experimental
Work
Strengthened.

experimental work. Dr. Withycombe in his report explains the extent and character of the work of the different departments of the Station, and indicates the results that have already been obtained in the solution of the problems that are encountered in the development of the agricultural interests of the state.

Each department of the Station is making certain independent special investigations, while a number of the departments do co-operative work covering a broader field. There is also co-operative work along certain lines with the U. S. Department of Agriculture, and to some extent with the fruit growers and farmers in different parts of the state. The most important subjects under investigation are as follows: In Agronomy, soil fertility, value of alfalfa for hay and pasture, value of kale as a winter succulent feed, variety testing of vetch, improvement of fertility by clover cropping, breeding wheats for increase in quantity and quality of yield, value of irrigation for different crops in the Willamette Valley: in Animal Husbandry, soiling dairy cows, digestibility of steamed corn and vetch silage, determination of value of kale as a winter feed for swine: in Dairy Husbandry, fat contents of hand separator cream, milking machines, fat production of individual cows, intensive dairying with the Station herd, percentage of solids other than fat in milk: in Poultry Husbandry, brooding, incubation problems, including natural and artificial incubation: in Horticulture, cross pollination of the apple, cover crops, cultural methods, irrigation of fruit in Rogue River Valley, determination of the best varieties for Willamette Valley: in Entomology, gumosis of the cherry, peach tree spot, lime-sulphur spray, including control of apple scab and other fungus diseases, apple tree anthracnose, demonstrating the extent to which it is possible to exterminate the disease: in Agricultural Chemistry, soil leaching, digestibility of corn and vetch silage, chemical studies in incubation, composition of milk, potash determinations: in Bacteriology, cause of

Subjects

Under

Investigation.

mortality in incubator chicks, transmission by feeding to fowls of tubercle bacilli of the bovine and human types.

In certain phases of this work the departments of Chemistry and Bacteriology are co-operating with the Poultry Husbandry department; the department of Chemistry, with Animal Husbandry and Agronomy; and the department of Entomology, with Horticulture; while the department of Agronomy is co-operating with the U. S. Department of Agriculture in irrigation and in testing different varieties of vetch.

Co-operative
Work.

During the year 1907-1908, seven bulletins were issued, aggregating 63,000 copies, with a total of 12,079,000 pages circulated. Upwards of 10,000 letters were written by members of the Station Staff in reply to correspondents desiring information or advice.

The demand upon the Station for free routine work has increased to such an extent that it will be necessary to make some special provision for this work, if it be continued, since the Federal appropriations to the Experiment Station can be used only for strictly scientific work of investigation. This work comes mostly to the departments of Chemistry, Entomology, and Bacteriology, and includes tests for different diseases, such as tuberculosis; and the examination, or analysis, of soils, waters, oils, clays, insecticides, feeding stuffs, phosphates, lime, gypsum, etc. Much of it is important work, frequently involving questions relating to the public health, or to the establishment of important industries. Provision should be made for it if possible.

Free
Routine
Work.

Special attention is called to the report of the Director regarding the importance of procuring additional land for the work in agronomy, dairying, animal husbandry, and horticulture. The College owns 224 acres of land. Upwards of 40 acres of this is required for the campus, leaving about 180 acres for the farm, gardens, and orchards,—an amount entirely inadequate for the proper development of the agricultural work of the institution. The amount of land re-

quired by the agricultural and mechanical colleges is shown by the fact that the Iowa State College of Agriculture and Mechanic Arts has 1,175 acres; the Kansas Agricultural College, 430; the Massachusetts Agricultural College, 404; the Michigan Agricultural College, 684; the North Dakota Agricultural College, 640; the University of Illinois, 665; the University of Ohio, 439; the South Dakota Agricultural College, 560; the University of Wisconsin, 500; the Washington State College, 410; the Colorado Agricultural College, 1,818; and the University of California, 779. Notwithstanding the fact that the University of Wisconsin then owned more than 400 acres, that institution three years ago expended \$77,000 for additional land for its college of agriculture. Iowa also, with more than 800 acres, has bought, during the last four years, 300 acres for the use of the departments of animal husbandry, agronomy, forestry, and horticulture. All these departments in the Oregon Agricultural College are in urgent need of more land.

When the departments of dairy and animal husbandry are provided with the different breeds of live stock required for the work of instruction and experiment, large tracts of land will be required to produce sufficient feed and pasture for these animals, besides what is needed for the work of the other departments named. Aside from the necessity of having adequate room for all of the work of investigation, the importance of having plenty of land for class work may be realized when it is considered that the farm, orchards, and gardens constitute an important part of the field laboratory equipment for the agricultural students.

The principal lines of investigation at the branch station at Union have related to the production of high-grade sugar beets, the improvement of forage crops and cereals by breeding and selection, the determination of grasses best adapted to local range conditions, the investigation of different forage plants, particularly alfalfa, adapted to dry-land farm-

Additional
Land
Needed.

Union
Branch
Station.

ing, and the collection of important data relating to fruit growing by an orchard survey of the Grande Ronde Valley. Important work has already been accomplished by this station. It can no doubt be strengthened, however, and made of even greater value not only to Grande Ronde Valley, but also to other parts of Eastern Oregon. The specialists in the College should be kept in closer touch with the work. They should plan the experiments in consultation with the superintendent, and should have general direction of the work of their particular departments. This will avoid unnecessary duplication of effort, will give the superintendent the advantage of constant expert assistance, and will insure greater unity of effort and a higher degree of general efficiency. By using the station at Union as a center of operations, important work can be done at comparatively little cost in different other districts, not too remote, through co-operation with progressive farmers. This will make possible the solution of problems of peculiar local interest which could not be reached by the work at the station itself.

The reclamation by irrigation of large tracts of land where the precipitation of moisture is insufficient to produce profitable crops is becoming one of the most important features in the agricultural development of the United States. By irrigation, millions of acres of otherwise desert lands have been reclaimed during recent years and converted into the most certain and productive farms of the country. As given in the Report of the U. S. Department of Agriculture for 1907, more than 11,000,000 acres were under irrigation during that year; and produced crops valued at \$175,000,000. For 1908, it is estimated that the area was increased by 5,000,000 acres, making the total amount of land in the United States under irrigation 16,000,000 acres, with a productive capacity of more than \$250,000,000. So important has this reclamation work come to be regarded, that the Reclamation Service of the Federal Government has expended \$38,780,000, to which it is adding several millions

Land
Reclaimed by
Irrigation.

each year, for the development of irrigation enterprises of such magnitude that they cannot be handled by private capital. Of this amount, the expenditures in the Pacific district aggregate \$9,512,000. The amount expended to December 1, 1908, on the Klamath Project was \$1,644,000; while the Umatilla Project will have cost when completed \$1,200,000.

It has been discovered, however, and is being woefully realized every year, that to convey the water from the streams to the land does not solve the entire problem of reclaiming the desert. As soon as the water is applied to the land, difficulties almost innumerable arise about which most of the people, who have had no experience in irrigation,

have no knowledge, and with which they are unable to cope. The quantity of water, the time and method of application, and the methods and degrees of tillage, that will pro-

duce the best crops of different kinds, under varying conditions of soil and climate,—these are a few of the many questions that must be determined before satisfactory results can be obtained on these lands. To determine the best varieties of fruits and other crops adapted to local conditions, and the most economic means of conserving the fertility of the soil under irrigation; and to solve the other innumerable questions that confront the people in the irrigation districts, under conditions entirely strange

to most of them at least,—are tasks impossible of accomplishment by the individual land owners. These difficulties can be overcome only by the maintenance of demonstration farms, or experiment stations, in charge of expert scientists, and provided with the necessary equipment for thorough investigational work.

At the solicitation of prominent citizens interested in the Umatilla Irrigation Project, the Oregon Agricultural College undertook an investigation, during the month of September, 1908, with the view of determining whether or not it would

be necessary to establish an irrigation demonstration farm, or experiment station, on or near that project; and, if so, the feasibility of obtaining the necessary funds for the maintenance of such station. The party making this investigation included, besides the President of the College and his Secretary, Professor Scudder of the department of Agronomy; Mr. A. P. Stover, Irrigation Specialist of the Division of Irrigation, U. S. Office of Experiment Stations; and Mr. W. M. Jardine, Cereal Expert in the Bureau of Plant Industry, U. S. Department of Agriculture. A careful examination of the lands in the project, and a consideration of the climatic and other conditions, in connection with the large local and state interests involved, left no doubt either as to the necessity or feasibility of the work. It was apparent also that the work would require the most careful consideration, and that it should be taken up at once, and pushed with all possible vigor, in order to avoid the failure of a large proportion of those who are settling on the project. The Reclamation Service had already set aside forty acres of the best land on the project for a demonstration farm, and experiment station. On account of the great expense involved in preparing land, constructing laterals, and providing the necessary buildings and other permanent improvements, besides the heavy annual outlay that would be required for maintenance, the College authorities began negotiations for the co-operative assistance of the Department of the Interior and of the Department of Agriculture. Under instructions from the Board of Regents, the President visited Washington in November for the purpose of interviewing the different Government officials in regard to this important work. The uniformly courteous and prompt consideration received from these officials was most gratifying, indeed. Every proposition presented was approved, and the State can depend upon whatever assistance it is possible for the Federal Government to give, not

Investigation
of Conditions
on Umatilla
Project.

College
Solicits
Government
Aid.

only in this but in other experimental work. The attitude of the Reclamation Service is indicated by the following letter from the Honorable James R. Garfield, Secretary of the Interior, dated November 21, 1908:

Reclamation	“Following your suggestion for co-operative work on an
Service	experiment and demonstration farm on the Umatilla project,
Furnishes	Oregon, I have carefully looked into the matter and am very
Land and	glad to state that it will be entirely feasible to
Improvements.	co-operate with the State in this very neces-
	sary work. The interest of yourself, your
	College, and other public-spirited citizens of
	Oregon, is highly appreciated, and I feel con-
	fident that good results will follow united
	efforts in this direction.

“Accordingly, I have authorized the use of \$3500 of the Reclamation Fund for providing permanent improvements and equipment for a demonstration farm, and have directed that the preparation of the farm be undertaken and carried to completion as soon as possible.

“This action is taken with the understanding that an earnest effort will be made to secure authority and funds from the State Legislature to maintain and operate this demonstration farm in the interests of the settlers. You are authorized to use this letter as an indication of the attitude of this Department upon this subject.”

On the same date a letter was received from Acting Director A. B. Davis of the Reclamation Service, in which occurs the following statement:

“This is a very useful and necessary work, and the Reclamation Service will be glad to co-operate with your College in every way possible. I have already issued orders to the Project Engineer to prepare for the equipment of this farm, after a conference with you or your representative.”

In accordance with the foregoing, the Department of the Interior provides the land, properly cleared and fenced, with water for irrigation conveyed by ditches or pipes over all parts of the farm, and the necessary permanent improve-

ments and initial equipment. The buildings to be provided, as planned in conference with the Project Engineer, Mr. H. D. Newell, include a cottage for the superintendent, a deep water well, a barn and storage building, and a small building to be used for an office and a laboratory.

Negotiations were also entered upon with the Department of Agriculture for the purpose of securing the co-operative assistance of this Department in the maintenance of the station. In a letter received from Dr. B. T. Galloway, Chief of the Bureau of Plant Industry, dated November 25, 1908, it is stated that "this Bureau is desirous of assisting in this work in every way possible." After referring to the proposition of the Reclamation Service to provide the land, buildings, and other improvements necessary, on condition that funds be secured for the maintenance of the station, Dr. Galloway explains that in the appropriations requested from Congress for the next fiscal year, provision is made for certain co-operative experimental work; and continues:

"I believe it is estimated that it will require between \$5,000 and \$6,000 per annum to operate this experiment station along the lines contemplated, and in case the above mentioned appropriation is made by Congress, we will contribute approximately one-half of this sum. Of course, it would be impossible, in advance of Congressional action, for me to say definitely that we can aid you financially, but I can assure you that in case Congress acts favorably in the matter, we will be glad to aid you, both financially and otherwise. In any event, we shall do whatever we can in the way of giving you expert aid.

"It is my opinion, that, as a matter of policy, the experimental and investigational work on these Reclamation Projects should be supported, chiefly by the States in which the Projects lie, and we stand ready to assist in the experimental and investigational work on these farms to the fullest extent of our power."

While the proposition of the Department of Agriculture is conditional on receiving from Congress the appropriations

Department of
Agriculture
Co-operates
with State in
Maintenance.

referred to, since the matter has the hearty endorsement of the Secretary of Agriculture and the Secretary of the Interior, as well as the different experts directly interested, there is really no doubt in regard to the co-operation of

State
Appropriation
Required.

this Department in the way indicated. These propositions from the National Government, however, are both contingent upon the establishment of the experiment station by the State Legislature, and upon an appropriation from the State for approximately one-half the expense of maintenance. The difficulties on the Umatilla Project are such that the larger amount mentioned by Dr. Galloway will no doubt be required. It will be necessary, therefore, for the State to appropriate \$3,000 as its proportion of the maintenance expense.

Another very important line of investigation that should receive attention by the State is dry-land farming. There are large tracts of land that cannot be irrigated and on which ordinary crops cannot be profitably produced.

Dry-land
Farming.

By discovering or producing, by selection and breeding, the different varieties that have the necessary drouth-resistant qualities, hundreds of thousands of acres of land in Eastern Oregon that are now practically valueless can be brought under successful cultivation. As an illustration of what can be accomplished in this connection, reference may be made to the work of the U. S. Department of Agriculture in introducing durum wheat into this country. From 1899 to 1902

Durum
Wheat.

different varieties of this wheat were brought from Russia and Africa which formed, as stated by Secretary Wilson, "practically the entire foundation of the present crop of durum wheat. At a cost of \$10,000 in the beginning, a crop worth \$30,000,000 is now growing in regions of low rainfall where in the days of stock ranges a steer roamed on twenty acres to find his living." In 1905, 10,000,000 bushels of this wheat were exported to Europe; and, in 1906, 20,000,000 bushels.

In 1907, 3,000,000 acres were sown to the durum wheat, and produced an average crop of fifteen bushels to the acre.

In certain sections of Oregon there are large areas of land that are now under cultivation and that are producing profitable crops on alternate years, by the process of fallowing. Such land can be farmed successfully only in large tracts, and the system of farming is unavoidably such as to render impracticable the establishment of

Advantages of
Diversified
Farming.

many homes on the land. The question, therefore, of working out a system of rotation that will make possible a crop every year instead of

one in two or three years, while at the same time conserving the fertility of the soil and providing forage for dairy animals, becomes a very important one. This would increase the productiveness and therefore the value of the land, especially when farmed in small tracts; and many of the large farms would then be divided and sold to small holders for homes,—all of which would increase the permanency of residence, would add to the educational and social advantages of the rural country, and would increase the revenues of the State. But these questions cannot be solved by the indi-

Branch
Dry-land
Station
Required.

vidual farmers on account of the large expense involved and the lack of the necessary scientific training. By the establishment of branch experiment stations, however, this work can be done at comparatively small cost. On the tour

of investigation referred to above this matter also received very careful consideration, and it was determined that such work is not only feasible but is of the greatest importance in the development of a system of permanent agriculture in many parts of central and eastern Oregon.

As a means of reducing the cost to the State, the co-operation of the U. S. Department of Agriculture was also solicited in the maintenance of a dry-farm experiment station. Regarding this work, Dr. Galloway, in a communication dated December 10, 1908, says:

"In reference to our conversation of the 21st ultimo, relative to the establishment of a dry-farm experimental station for co-operative work between the Bureau of Plant Industry and the Oregon Agricultural College Experiment Station, I submit the following statements for your consideration:

"The Bureau of Plant Industry of the U. S. Department of Agriculture is willing and anxious to assist in the improvement of its agriculture, to whatever extent the funds of the Department will allow, when convinced that the people of such State are doing everything reasonably within their power to improve their own agricultural conditions.

U. S. Department of
Agriculture
Will Assist.

"The Bureau of Plant Industry is willing to assist the people of Oregon in the maintenance of a dry-farm experimental station where problems vital to the agriculture of that region can be worked out. The Bureau, therefore, will bear the expense of employing a scientist to personally supervise the work of experimentation and any additional expense connected with the administration and inspection of the station, such total expense for the present to be between \$2,500 and \$3,000 annually."

This proposition is made with the understanding that the land, improvements, and initial equipment will be provided, and that the State will appropriate an amount annually for maintenance equal to that expended by the Department. Should the establishment of such station be approved, it will be necessary for the Legislature to appropriate \$2,500 a year for maintenance. The matter of locating the station, however, should be left to the Board of Regents, after a thorough investigation has been made by experts from the College and a representative of the U. S. Department of Agriculture. This is very important in order that the necessary information may be had to secure the establishment of the station at such point that the conditions will be typical of the largest possible area, and the work at the station, therefore, of the greatest possible value.

Legislative
Action
Necessary.

COLLEGE EXTENSION.

One of the most pressing needs in the development of agriculture is for the different phases of extension work which carry to the farmers up-to-date information on agricultural subjects. It is being recognized more and more that the matter of superceding by modern scientific work the methods that have characterized agriculture in the past, is a question of educating the people on the farms. At best, comparatively few of the farmers of the state can pursue work in residence at the College. New truths are being discovered, and new applications are continually being made of principles already known. But these are of practical

Importance of
Extension
Work.

value only to the extent that they are understood and utilized by the farmers. So important has the matter of college extension in agriculture come to be regarded, that there is probably more attention being given to it at the present time than to any other phase of agricultural education. On account of the remarkable development of agricultural science along all lines during recent years, the matter of improving the farms of the country is not now so much a question of discovering new truths, as it is of securing the practical application of facts already understood. As stated in a letter received from the Honorable John Hamilton, Farmers' Institute Specialist of the Office of Experiment Stations, dated December 21, 1908:

"We have now an almost unlimited amount of agricultural information accumulated in various depositories. We have not yet been able apparently to devise an effective plan for the distribution of this information. It is true, we have been printing bulletins by the million, but unfortunately many of these are not read and many that are read are not well enough understood or appreciated to be properly utilized. We are needing a system of dissemination that will not only take the information to the individual in a way that he can understand, but that will see that it is incorporated into his every-day practice. My belief is that the movable school will

Mr. Hamilton's views.

be an important aid in doing this, and the demonstration field with the advisory professor, who will look after the agriculture of a given district and conduct the demonstration plots or fields in various communities, will be the agent to see that the knowledge imparted is incorporated into farm operations."

At different times during the last few years the subject of extension teaching has received most careful consideration by different state, and national, or inter-national, organizations, notably the American Association of Farmers' Institute Workers, and the Association of American Agricultural Colleges and Experiment Stations. At the convention of the latter organization in Washington, D. C., November 19, 1908, a report of the committee on extension work was adopted, in which it is recommended—

"That each college represented in this Association organize, as soon as possible, a department of extension teaching in agriculture, co-ordinate with other departments or divisions of the agricultural work, with a competent director in charge, and if possible with a corps of men at his disposal." In the same report it is urged that in the extension department "there should be fully organized the economic and social phases of agriculture, and also that great, untouched field of educational work—home life on the farm."

Different phases of agricultural extension work include study clubs, farmers' institutes, itinerant schools, publications, personal correspondence, and correspondence courses.

Several states have made great progress in recent years in the development of this work.

Extension	Enterprises.
This is notably true of Iowa. In April, 1905, the legislature of that state appropriated \$15,000 to the College of Agriculture and Mechanic Arts for the organization and maintenance of a system of agricultural extension work, and at the subsequent session this amount was increased to \$27,000. With this appropriation the College is empowered—	

"To give instruction on corn and stock judging at agricultural fairs, institutes, and clubs, and to aid in conducting

short courses of instruction at suitable places throughout the State; to give lectures and demonstrations on the growing of crops and fruits, on stock raising, dairying, land drainage, and kindred subjects, including domestic science. The work is to be planned so as to carry to the communities remote from college the benefits of skillful instruction given by the teachers in the State College, and the results reached in the work of the experiment station."

Work in
Iowa.

Up to the present time, farmers' institutes have constituted the most important agency for extension work in agriculture. Until within the last few years the institute work consisted largely of lectures of a more or less popular character, and, as a matter of giving the farmers general information and of encouraging them to improve their methods, the work no doubt has been of great value. But the most important work now required is practical demonstration work which enables the farmers to get a workable knowledge of the subjects presented. For this work several states are organizing movable schools. These schools are in charge of an expert instructor, with assistants, who are provided with the necessary equipment, and travel from place to place, holding schools of two or more days duration at each place. The work is of the most practical character, the purpose being to give such a comprehensive understanding of each subject that what is learned can be applied on the farm. During the past year, the schools generally continued through only two days. In most states that have established these schools, however, the work has been so successful that the time is extended this year to a week, and in some states to two weeks. The plan varies in different states according to local conditions and the amount of money available for the expense.

Movable
Schools.

As soon as practicable the Oregon Agricultural College should organize a regular department of agricultural extension. Sufficient money should be provided to meet the expense of at least one traveling school that should be kept

in the field for from eight to ten months of the year. The work could then be more fully organized and extended as conditions may warrant.

During the year 1906-1907, there were held in the United States, 3,927 farmers' institutes, 11,514 sessions, in forty-five states, with a total attendance of 1,596,877. In addition to the regular institutes, eleven states held special institutes for women, while five different states ran demonstration trains. The cost of farmers' institutes for the year was \$284,450, while the amounts appropriated for 1908 exceeded \$300,000.

In Oregon, during 1907 there were held 60 institutes, 157 sessions, in 16 different counties, with an aggregate attendance of 15,700. During this year members of the College faculty spent 219 days in institute work. In 1908 there were 25 regular institutes and 45 demonstration train institutes, with 98 sessions, in 23 different counties. The aggregate attendance at the regular institutes was 7,070, and at the demonstration train institutes, 25,250, making a total attendance at all of the institutes of 32,320. The work covered practically all of the different lines of agriculture of interest in Oregon, besides special work in some of the institutes for women.

Special credit is due to the Southern Pacific and the Oregon Railway and Navigation companies for the assistance they have given in this important work. In addition to providing the institute lecturers with transportation over their lines for the regular institutes, these companies furnished free of cost two demonstration trains fully equipped with exhibit and demonstration cars, lecture coach, and sleeper. This work is of exceptional value in arousing among the people greater interest in the importance of improved methods in agriculture. The demonstration train through the Willamette Valley during the month of November, 1908, was especially successful. So far as known this is the most

Farmers'
Institutes.

Assistance of
Railroads.

elaborate train of the kind that has ever been sent out in the United States. Seven cars were fully equipped for the work. Besides the College professors in charge of the different departments, a number of prominent railroad officials and representatives of the press accompanied the train. Congratulatory letters have been received from Government officials and others on both the extent and character of the work done and the complete account given of it by the press—particularly the Pacific Northwest.

For the most effective work in farmers' institutes, and other itinerant phases of agricultural extension, there should be an appropriation from the Legislature sufficient to provide for the employment of a superintendent who could devote his entire time to the work, in addition to the other expenses of speakers and publications. The importance of the work is such that from \$5,000 to \$10,000 a year could be used to very good advantage. Indeed, a much larger sum even than this would be required to fully organize the work and extend it throughout all parts of the state. In planning all such enterprises, it is well to bear in mind that the most expensive work, and in many respects the most important, is required in the remote and least accessible sections of the state, where the difficulties with which the people have to contend are frequently the greatest.

Cost of
Extension
Enterprises.

ENGINEERING AND MECHANIC ARTS.

The School of Engineering and Mechanic Arts offers courses leading to degrees in Civil Engineering, Electrical Engineering, Mechanical Engineering, and Mining Engineering; also an elementary course in Mechanic Arts for training in the handicrafts. This School is fully organized with a Dean of the School and a Professor in charge of each department. As given in Dean Covell's report, the student attendance increased from 199 in 1906-1907 to 444 on November 20, 1908, or 123 per cent. Of the total College regis-

tration, about 30 per cent of the students are in Engineering. The distribution of the students among the different courses is as follows: Civil Engineering, 108; Electrical Engineering, 157; Mechanical Engineering, 76; Mining Engineering, 50; and Mechanic Arts, 53. In addition to the work of the regular courses, all students in Agriculture take shop work in carpentry and blacksmithing through at least one year, so that more than half of the entire student body have work in the shops.

The importance of engineering in the construction of highways, railroads, factories, and cities, in the improvement of inland waterways, and in the utilization of water power for manufacturing and transportation purposes; and the inter-dependence of engineering and other distinctive lines of College work, have already been referred to in this report and need not be repeated here.

The extent and character of the work being given by each department, and the number of students pursuing the different subjects, are shown in detail in the accompanying report of the Dean, but may be briefly summarized as follows: In Civil Engineering are given 13 different courses in sanitary engineering, roofs and bridges, highway construction, masonry and foundations, irrigation engineering, city and topographic surveying, aggregating 45 semester credit hours in 16 different sections, with a total registration of 200 students; in Electrical Engineering, 11 different courses in dynamo electric machinery, elements of electrical engineering, dynamo design, electrical engineering laboratory, power plants, power plant design, and electrical laboratory, aggregating 30 semester credit hours in 27 sections, with a total registration of 166 students; in Mechanical Engineering, including shop work, are given 28 different courses in hydraulic motors, steam turbines, internal combustion motors, thermodynamics, enginery, steam machinery, engineering laboratory, machine design, hydraulics,

Department
Statistics.

Scope of
the Work.

strength of materials, statics and dynamics, materials of engineering, mechanism, descriptive geometry, and mechanical drawing, besides the work in the carpentry, forge, and machine shops, aggregating 81 semester credit hours in 62 sections, with a total registration of 1,041 students; in Mining Engineering are given 12 different courses in metallurgy of copper, general metallurgy, mining law, mining, fire assaying, mine surveying, metallurgy of iron and steel, excavating and tunneling, geology, and mineralogy, aggregating 40 semester credit hours in 18 sections, with a total registration of 177 students.

During the biennium the facilities for the work in engineering have been extended and very much improved by the purchase of important equipment, and by the completion of the Mechanic Arts building and the improvements that have been made in Mechanical Hall. A number of additional instructors have also been employed. But, with the means available, it has been impossible to provide the additional equipment and instructing force required to meet the increased demands. The large number of students in the engineering work, and the increase in the number of advanced subjects given, make it imperative that additional instructors be employed during the next biennium. As explained by Dean Covell, extended equipment is required for the work in the engineering laboratories. The most important items of this equipment needed at this time are given in detail in the appended report of the Departmental Estimates of Requirements.

In connection with the shop equipment, the most urgent need is for a foundry and a wheelwright shop. Students in engineering should be given courses in moulding and casting as a part of their regular shop work; besides, with a foundry provided, the students could make the castings required for machines and other apparatus that could then be made in the machine shop, thereby saving in a short time, in the

**Additional
Equipment,
Instructors
Required.**

**Foundry
Needed.**

value of such equipment, the entire cost of the foundry. There is a demand also for this work by students who are pursuing the elementary industrial course, and who desire to become expert moulders or wheelwrights. The cheapest and best plan by which to provide for this work would probably be to construct a small building extending south from the present forge shop, parallel with Mechanical Hall. This would make it possible to connect with the present blast and exhaust fans. It would also be a convenient location on account of its close proximity to the other shops. This building could be constructed on the same general plan as the east wing of the Mechanic Arts building, and would be comparatively inexpensive.

An important line of engineering work for which there is great demand throughout the state is road building. According to the Office of Public Roads, U. S. Department of Agriculture, there were in Oregon in 1904, 34,258 miles of public highways, exclusive of the streets in cities and towns. During that year upwards of \$796,000 were expended on roads. This is an equivalent of more than \$23 per mile, or nearly \$2 per capita of state population. If the cities, the streets of which are not included in the above, be omitted the cost is \$3 per capita. That the people of the state appreciate the importance of good roads is clearly shown by the fact that they spend so much for their improvement. But, while nearly \$800,000 is contributed every year for building or improving public highways, what provision is made for training men to use this money in the most economic and effective way? It is impossible to determine, even approximately, the extent of the waste resulting from incompetent supervision of road building, but practical men who have had years of experience in this work have estimated that it is at least 25 per cent, and in many cases will reach as much as one-half. Even assuming that the loss is not in excess of 15 per cent, a very conservative estimate, this

Importance of
Highway
Engineering.

would amount to nearly \$120,000 annually—several times greater than the entire amount required to meet the expense of all the engineering work in the Oregon Agricultural College. The only way to get good roads is to have trained men supervise their construction.

To meet this demand, the College should establish and equip at once a department of Highway Engineering; or, if this be not feasible, provision should at least be made in the department of Civil Engineering for the employment of a specialist to give his entire time to this work. As stated by Professor Skelton in his report to the President:

“Through the agricultural Experiment Station, the College is doing a great work for the farmer and the horticulturist, but it has no funds with which it may help the cause of good roads further than it is now doing. We need funds to establish a properly equipped laboratory for the investigation of road problems. Enough help should be provided for the extension of work by which people may be given assistance in building roads, just as the Experiment Station staff are helping the farmers through institute and similar means. It should maintain a testing laboratory for the purpose of obtaining exact and reliable data on road building of all kinds, including cement which is coming extensively into use for culverts, bridges, etc. The best means of building roads and the cost should be investigated by the College and the results given to the people. Institutes for the instruction of road officials should be held, and every aid possible should be extended to the great movement for the betterment of our highways.”

A number of students are applying every term for work in architecture. With the different departments of engineering properly equipped for the structural work, provision could be made at comparatively little cost to meet the present needs of these students, by the employment of a good instructor in architectural design and drawing.

Work to be
Accomplished.

Applications
for
Architecture.

DOMESTIC SCIENCE AND ART.

In a former division of this report reference is made to the importance of special training for women in the science and art of home making. The Oregon Agricultural College was one of the first institutions in the country to inaugurate instruction in household science. As early as 1890 courses were offered in cooking and sewing, and a specialist was employed for this work. The value of what has been accomplished along these lines during the past eighteen years is realized in hundreds of homes throughout the state.

During the past year the work of the department has been largely extended, and has been organized into the School of Domestic Science and Art, with a faculty of five specialists in charge of the different subjects. Two courses are offered: an elementary two-year course, and a course leading to degrees. The elementary course is especially adapted to women who can spend but a short time in school and who desire to emphasize the work pertaining to the every-day duties of home life. This course is essentially practical, including as distinctive features such work as laundering, cooking, fruit work, sanitation and hygiene, hand and machine sewing, and dressmaking. While students are made familiar with the underlying principles, a large part of their time in the department is given to practical or laboratory work. In addition to the special work, as much time as possible is devoted to the general subjects, such as English, mathematics, history, drawing.

School Organized. The degree course extends through four years and includes, in addition to the work in the basic subjects of chemistry, physiology, physics, and bacteriology, thorough training in the different subjects of greatest value to the skilled housekeeper—cooking, foods, dietetics, marketing, laundering, house sanitation, household economics, home nursing, house construction and furnish-

Extent of Work Given.

ing, sewing, drafting, costume design, dressmaking, tailoring, millinery. This course is also well adapted to persons who desire to teach domestic science and art. Students may specialize along different lines in which they have interest in preparation for professional work.

The number of students enrolled on November 1, 1908, was 177, an increase of 40 per cent over the preceding year. Of these, 19 were in the elementary course, and 158 were either in the college course or were pursuing advanced work as graduate students. The subjects given during the first term of the present year include: principles of cookery, advanced cookery, nature study, bacteriology, house sanitation, plain sewing, dressmaking, tailoring, millinery, house construction, basketry and weaving, and costume design, with a total registration in all subjects of 554 students in 27 different sections.

The facilities for this work were also increased and very much improved. The science work is provided for on the first floor of Waldo Hall. In addition to the office of the Dean, and the class rooms, there are two cooking laboratories and a science laboratory with the most modern equipment, including desks, gas, and ranges; storage rooms, a laundry, and the necessary general equipment for the most up-to-date work. For the work in domestic arts, temporary provision is made on the second floor of the new Agronomy building. The equipment for this work includes an office, class rooms, and three large rooms fully equipped for the work in drafting, dressmaking, millinery, sewing, house construction, etc.

During the next two years it will be necessary to provide complete equipment for the laundry, for both school and dormitory purposes, and for an additional cooking laboratory. An additional instructor will also be required, at least during the second year.

COMMERCE

In the School of Commerce thorough courses are given in the different subjects of business administration, including accounting and auditing; political economy, including banking and finance; political science, including commercial law; and stenography and type-writing. Special emphasis is placed upon the training in business methods required by students in the other different courses—engineering, agriculture, forestry, pharmacy, and domestic science and art. It is coming to be recognized more than ever before that to succeed in any business or profession one must have training in the application of business principles. In recognition of this, the College provides in the School of Commerce courses in business methods specially adapted to the particular needs of persons engaged in the different industrial vocations or professions.

As reported by Dean Bexell, on November 1, 1908, there were 212 students registered in the commercial courses. The subjects given include elementary and advanced accounting and auditing, business practice, banking and business management, banking and finance, commercial law, civil government, stenography and typewriting, pharmacy accounting, household business management, and business organizations.

The work in commerce is comparatively inexpensive, though it is of great importance to all the students of the institution, regardless of the courses they may be pursuing. Since most of the students in all of the courses have certain work in commerce, it will be necessary to provide an additional instructor for this work.

Commercial
Work
Inexpensive.

FORESTRY.

There is an increasing interest in the course in Forestry. The number of students enrolled is much larger than during the preceding year, and the attendance would be still greater

if the department were properly equipped for the work. Inquiries are received from different parts of the Northwest regarding the advantages afforded by the College for training in forestry, but it has not been possible to offer any special inducement for persons to take up this work, although the students who have entered the course have been given the best training possible under the circumstances.

Interest in
Forestry.

For years emphasis has been placed upon certain lines of agriculture that represent an annual income to the state of less than one-fourth of the income from the forest industry, and yet comparatively little attention has been given to the importance of forestry education. With standing timber estimated by the U. S. Forest Service at upwards of three hundred billions of feet, or one-sixth of all the standing timber in the United States, and an annual income of approximately \$30,000,000, the forest industry must certainly be regarded as one of the greatest in the state. However, there is an annual loss from preventable causes of from \$3,000,000 to \$5,000,000. To reduce to a minimum the losses from diseased timber, and from the wasteful methods of harvesting the timber crop, and otherwise to conserve the forest resources and develop the forest industry, a large number of men are required who have had thorough, scientific training in forestry. It is of the utmost importance, therefore, that provision be made as soon as practicable for strengthening the course in forestry by providing the necessary room, equipment, and instructing force required for efficient work.

Necessity
for Forest
Education.

To provide adequately for this work, Professor Lake estimates that forty acres of land will be required for forest and nursery, besides room for office and class work and for greenhouse laboratory; and the necessary laboratory and other miscellaneous equipment. The most imperative need, however, is for a thoroughly competent instructor for technical work in forestry. All of the equipment referred to above

Equipment
Required.

need not be provided at one time. Temporary arrangements can be made without the purchase of the land, though this will be essential later; but, for the work that will be called for during the next two years, it is unavoidable that more room and considerable equipment be provided, and that at least one instructor be employed.

PHARMACY.

In the department of Pharmacy, the number of students in 1906-1907 was 78; in 1907-1908, 80; and in 1908-1909, 91. As reported by Professor McKellips, the College is the only institution in Oregon offering a complete course in pharmacy. More than 95 per cent of its graduates are engaged in professional work at good salaries. The demand for graduates continues to be greater than the supply. The

Efficiency and
Completeness
of Work.

work of the course is arranged so as to meet the requirements of the State Board of Pharmacy, and the efficiency and completeness of the work are shown by the approval received from this Board and by the large percentage of students who are successful in the examinations and who have lucrative positions. The extent and character of the work of the department, and its relation to the other sciences authorized under the Acts of Congress, are shown in the report of Professor McKellips, printed in the Appendices.

MISCELLANEOUS DEPARTMENTS.

The reports of the heads of the different miscellaneous departments all show the large increase there has been in the amount of work given, and urge the necessity for more room for class and laboratory purposes; and, in the science departments, for more equipment. Without exception the importance of increasing the instructing force is emphasized. Since the equipment and instructors needed are given in the Appendices, it is not deemed necessary to

encumber this part of the report with a repetition of these items. As an indication of the general conditions in these departments, the following may be mentioned:

In Zoology, the department report shows an increase during the past two years of 800 per cent in the number of courses given, and of 600 per cent in the number of students; and estimates that for the next biennium the
Zoology. increase in the number of courses will be 50 per cent, and in the number of students, 250 per cent. This increase is due in part to the readjustment of the College courses and to the requirement of a larger amount of science work. The work of this department is essentially laboratory work; and, with the number of students in attendance during the next two years, a large number of microscopes and other important equipment will be required. Several additional rooms will also be needed, and at least one additional instructor.

The department of Chemistry is perhaps the most crowded of all the departments in the institution for room, equipment, and instructors. The attendance is nearly double what it was a year ago, and all of the labora-
Chemistry. tories are crowded far beyond their present capacity. The instructing force is entirely inadequate, all of the instructors having excessive hours and a larger number of students than it is possible to handle and do efficient work. Except for the possibility of securing more room for the department of Chemistry by the removal of agricultural work into another building, it would be imperative that a special building be provided for this department, or that students be excluded from the classes. To provide properly for the instructional work in Chemistry, and for the station laboratories, it will be necessary to use a large part of Agricultural Hall during the next two years; and, within a short time, this entire building will be required. To give reasonable relief, continuing as large classes as can possibly be handled to advantage, three additional instructors will be needed during the biennium.

The department of Bacteriology has devoted most of its energies to experimental work. The present room is sufficient for the accommodation of the students in this work, but additional equipment and assistance will be required.

The work in Botany has been given in the same department with Forestry. The employment of a special instructor in Forestry, as previously suggested, with the necessary room and equipment provided, will also improve the conditions for the work in Botany.

During the past year the work in Physics has been segregated from the departments of engineering, and placed in charge of a special instructor. The difficulties under which this work is being done are indicated by the fact that there are eight sections in laboratory work and six sections in recitation work, for all of which there is but one instructor with part time of a student assistant. Additional room and equipment, and at least two instructors, will be required during the biennium.

A similar condition of congestion exists to a greater or less extent in the other departments of mathematics, English language and literature, modern languages, history, Latin, and drawing. These departments will require very little if any equipment, but are in great need of additional instructors and the necessary rooms for class purposes.

MILITARY SCIENCE AND TACTICS.

During the years 1907-1908 and 1908-1909, the work in the Military department has been in charge of Commandant U. G. McAlexander, Capt. 13th Inf., U. S. A. During the year 1907-1908, the registration in this department was 733; and, on November 1, 1908, 780. The cadets are organized into four battalions of four companies each. The work has been most

efficient in every particular. It is highly commended by Capt. Julius A. Penn, General Staff of the War Department, who inspected the work of the department in May, 1908.

The facilities, however, for the work in military tactics have become entirely inadequate. As reported by Captain McAlexander:

“The armory capacity is not more than one sixth of the requirements of the regiment and if the purposes of the War Department are to be carried out and the benefits of military instruction given to the young men of Oregon who are attending this College in large numbers, then it becomes imperative to increase the facilities for instruction. The first necessity is a large fire-proof drill hall and a sufficiently large armory to care for the equipment, and to furnish class and lecture rooms for necessary theoretical instruction. The walls of the drill hall should be built of re-enforced concrete and the roof of corrugated galvanized iron, and a dirt floor. This building should be about 120 feet wide and from 300 to 360 feet in length. The armory should be built in connection with the drill hall and should be a two-story structure, concrete walls, corrugated iron roofing, and provided with heat and light. This will be sufficient in capacity to accommodate 1,000 cadets.”

The Congressional Act of 1862 makes it mandatory that provision be made for work in military science and tactics, but inhibits the use of any of the Federal funds for the maintenance of the Military department. In accepting the Act of Congress, the State assumed the responsibility of complying with its requirements. This Act, so far as it relates to the military work, is administered by the U. S. War Department. This department prescribes the kind and amount of work that shall be given, and it is necessary that the College conform to these requirements. But it is impossible to do so under present conditions. To quote again from the Commandant's report:

“The present facilities offer standing room only, a state of congestion destructive of every attempt at practical work,

and rendering it impossible to comply with the requirements of the Government."

On account of the inclemency of the weather during a large part of the year, it is impossible to drill out-doors; and, since there is no room for drill under cover, it is imperative that a drill hall be provided sufficiently large for the work.

As explained in the Commandant's report, with the number of cadets now in the department, it will be very advantageous, and also a matter of economy, to arrange for the employment of a retired non-commissioned officer. His salary would not be more than \$1,000 for the two years.

MUSIC.

The School of Music is maintained without expense to the College, the director and instructors all being dependent upon the receipts from student fees for their compensation.

The work of this school, however, is very important, not only because of the opportunity it gives students who are interested in music to get the training desired, but also because of its value in the social life of the institution. In addition to the individual work on the different instruments, and in voice, there are the military band of some 35 pieces, a chorus of 150 members, a college orchestra, two glee clubs, and a mandolin and guitar club, in all of which the students take great interest and are doing good work. Membership in these different organizations is free, the training afforded thereby being given to the students gratis. All instructors in Music, and the different musical organizations, give their services freely and without charge in furnishing music for the assemblies and for other College functions. The work of the school is very successful.

Music
Self-
Supporting.

Musical
Organizations.

PHYSICAL EDUCATION.

The department of Physical Education has been more fully organized and placed in charge of a specialist. The importance of regular, systematic, physical exercise, is now recognized in all institutions of higher learning. The following paragraph from Professor Angell's report states the case so completely that it is given here:

"The demands of higher education require close application, and impose upon the boy or girl a sedentary life that would in many cases result in a weakened physique and a resultant physical inability to meet the problems of life that their mental training has prepared them for, unless these mental requirements are properly balanced by a normal amount of vigorous, recreative and healthful exercise. It is not a theory but a fact based upon comparative statistics showing that since the introduction of compulsory physical exercise in college curriculums, bodily vigor and physical health among American collegians has largely increased."

Students
Need
Systematic
Physical
Exercise.

The object in all of the different forms of athletics and out-door games, as well as in the regular gymnasium classes, is to have all the students participate in physical exercise of some kind under such regulations as will insure good health and symmetrical physical development. From measurements accurately taken and recorded, special work is prescribed for persons who are training to overcome physical defects. On account of the value of out-door work, students are encouraged to engage in all kinds of athletics, such as cross country running, track work, baseball, football, tennis, etc. To provide against danger from participation in athletic contests, all students are given a thorough physical examination to determine whether they have the physical ability to stand the strain of the vigorous exercise required.

Out-door
Work
Encouraged.

The students maintain an athletic association which finances all competitive inter-collegiate athletics. For the

support of this work each student pays to a general fund \$2 per semester, of which 70 per cent is used for athletic purposes. With the receipts derived from inter-collegiate games, this fund pays all expenses of athletic work, including equipment, salaries of coaches, traveling expenses of teams, etc.

Aside from the lighter games, such as tennis, and inter-society basketball contests within the institution, the work in physical education for women is confined to the usual gymnasium exercises, mostly along recreative and aesthetic lines, though special individual work is prescribed as required for corrective purposes.

LIBRARY.

During the past year the College Library has been moved from the first to the second floor of the Administration building. The room that was formerly used as an auditorium has been converted into a reading room.

The two adjoining class rooms on the north are used temporarily for the stacks. The books have all been catalogued according to the Dewey decimal system, and are now classified and arranged on the shelves so that they are easily accessible. The Library is a Government depository and receives all the documents that are sent to libraries. As shown in the report of the Librarian, there are at present in the library upwards of 12,000 bound volumes, and about 10,000 pamphlets. The reading room has a seating capacity for only 108 readers, and is entirely too small for an institution of this size.

Additional stack room will have to be provided. The importance of a new building in which adequate provision is made for the library work is discussed later in this report. While it will probably be impossible to get such a building during the next biennium, it will be very difficult to get along without it. In

fact, it will be impossible to arrange for the library work the students should do. The order in the library is excellent, and the work in every way is most satisfactory.

NEEDS OF THE COLLEGE.

As already indicated in different parts of this report, there is urgent need throughout the College for more room, and for large additions to the equipment and to the instructing force, in order to relieve the present congestion, and to provide even partially for the increase in the enrollment and in the amount of work that will be required during the next biennium. Upwards of 30 additional class rooms, a number of important laboratories, and several offices, are absolutely essential in order to provide properly for the work. The following buildings are needed:

1. HORTICULTURAL BUILDING. The necessity for this building and an explanation of its dimensions and construction are given on page 50. Architects have prepared general plans and they estimate that the building will cost \$41,000. The greenhouses, complete according to plans, sufficiently large to accommodate the departments of botany, horticulture, and entomology, will cost from \$10,000 to \$12,000. It is thought, however, that the work of these departments can be temporarily provided for by the construction of certain sections of these houses at a cost of \$4,000, making the total cost of the Horticultural building, with the glass houses required for present purposes, \$45,000.

2. THE CENTRAL AGRICULTURAL BUILDING. This building is to occupy the space between the Agronomy building and the proposed Horticultural building, being connected with these by closed passage ways. It will be of the same general style of architecture, constructed of concrete and brick, 140 feet by 78 feet, four stories in height. In this building

Horticultural
Building.

Room for
Experiment
Station.

provision will be made for the Experiment Station offices, tabulating rooms, mailing and storage rooms, library, and fire proof vaults for storage of station records; for the offices, class rooms, museum rooms, etc., required by the departments of animal husbandry, poultry husbandry, irrigation and drainage, agricultural economics, agricultural extension, including movable schools and farmers' institutes; and an assembly room for the School of Agriculture, with a seating capacity of 500 to 600. The completion of this building will place the Experiment Station, and the instructional departments referred to, in a permanent home under very much more favorable conditions, with sufficient room for the work. By the removal of these departments from the old Agricultural Hall, the rooms thereby vacated can be

Other
Departments
Provided For.

utilized in providing the extension required for the work in dairying, and for the station and instructional work in chemistry, the urgent necessity for which is referred to under Miscel-

laneous Departments. The completion of this building will make it possible to arrange temporarily also for additional rooms required by the departments of English, history, mathematics, drawing, and industrial pedagogy. The architects estimate the cost of the building at \$55,000. In this connection it may be explained that the new agricultural building really consists of four separate buildings—one for

Agricultural
Group of
Buildings.

Agronomy, one for Horticulture, one for Dairy Husbandry, and the central part for the general departments given above. The plan is to have these buildings all constructed of concrete and

brick, the purpose being to have them as inexpensive as possible, but substantial and convenient. The front elevation and general style of architecture are shown in the accompanying illustration.

3. ARMORY AND DRILL HALL. The necessity for this building is explained in a previous paragraph on Military Science and Tactics. That the requirements of the U. S. War Department may be complied with and the appropria-

tions from the Federal Government not jeopardized, it is necessary that provision be made without further delay for the construction of this building. Although it is planned to have the building as plain in design as possible, consisting of bare walls and roof, without floor, it will unavoidably be somewhat expensive on account of its having to be so large; but it cannot be smaller and give the room required for the work. The architects estimate that it will cost \$36,000.

Drill
Hall.

Library
Facilities
Inadequate.

4. AUDITORIUM AND LIBRARY. The present reading room has a seating capacity of only 108 persons. The stack rooms are at present over-crowded. Upwards of 1,000 volumes are received annually from the Government, in addition to the purchases that must be made from year to year to meet the needs of the students in the different courses. With an enrollment during the next biennium of upwards of 1,500, it is impossible that more than a very small percentage of the students can get any opportunity to use the library under present conditions. The importance of adequate library facilities in all of the work throughout the institution cannot be over-estimated. Furthermore, the only room in the institution that can be used for student assembly is the Armory. This room is not only unsuitable for the purpose of an auditorium, but it is now too small to accommodate the students. It is required for all of the indoor work in physical education, and at present it is also used for the storage of military equipment. In a large institution, no less than in a smaller one, there is great need for an assembly hall for lectures, concerts, convocations, commencement exercises, and other public gatherings, sufficiently large to accommodate all the students and faculty, with some room always for visitors. With the rapidity of the growth of the College, it would be unwise to provide an auditorium with a seating capacity of less than 2,500. In the administration of College affairs—in shaping student sentiment and in

Auditorium
Needed.

directing student activities,—an assembly room with sufficient capacity for the accommodation of the entire College community, is an absolute necessity. Provision for the auditorium and library should be made at the earliest date possible. However, it cannot be questioned that provision must first be made for the class rooms and laboratories required in the regular departmental work. And the other requirements that must be met at once are so great, that, badly as the auditorium and library building is needed, it seems unavoidable that the request for an appropriation for this building be deferred for the present.

Must Wait
for this
Building.

5. **FOUNDRY AND WHEELWRIGHT SHOP.** The necessity for this building is explained under Engineering and Mechanic Arts. It should be 41 feet by 132 feet, one story in height, constructed of concrete and brick, and should correspond in style of architecture with the Mechanic Arts building. The estimated cost is \$11,000. In addition to the room required for the foundry and the wheelwright shop, provision can be made in this building, for the present at least, for the work in steam fitting, plumbing, and electrical construction. For this work, which comes in the elementary course in Mechanic Arts, there is great demand, and provision should be made for it as soon as practicable. This shop would also be of great value in the repair work in steam fitting and plumbing. By having an expert in charge of these subjects, he could also keep up the repairs throughout the College, with the assistance of students, and thereby save a large part of the amount otherwise required for this work. It may be necessary, however, on account of the expense, to get along temporarily without this building.

Plumbing and
Steam
Fitting.

6. **HEATING PLANT.** The heating plant has sufficient capacity for about one-half of the present College buildings. As shown in Professor Covell's report, Mechanical Hall, the Mechanic Arts building, the Administration building, the

Agricultural Hall, and the Armory and Gymnasium—the buildings which are connected with the heating plant—have a total radiation in square feet of 16,180; while Cauthorn Hall, Waldo Hall, the Agronomy building, and Shepard Hall,

all of which are heated separately, together

Heating Plant Inadequate. have a radiating surface of 14,690 square feet, The Pharmacy building and the Mining laboratory, which are heated by stoves, would bring

the total heating radiation of the buildings not connected with the central heating plant above that of all buildings that are so connected. On account of the location of the present heating plant, it would be very expensive and in every way unsatisfactory to attempt to enlarge its capacity sufficient to provide heat for all the buildings.

Buildings Heated Separately. In fact, it would be impracticable to do so. To have separate heating plants in the different buildings is objectionable in the extreme. In

the first place, there is an element of danger from fire that should be avoided; besides the cost of heating buildings by separate plants is very much in excess of what it would be if the buildings were all supplied with heat from a central plant. For instance, in the report of the requirements for heating during the next two years, it is shown that the cost for labor in running the central heating plant is less than one-half that required in heating the buildings not connected with this plant. The best plan will no doubt be to begin at once a central heating plant, located near the southeast corner of the campus, in the vicinity of the present athletic field.

Central Heating Plant Needed.

This is the lowest point on the College grounds and to it there would be natural drainage from all the buildings. This location also has the advantage of being near the railroad so that fuel can be delivered directly from the cars. This alone would result in a saving at present of about \$400 a year, and the amount would increase as the plant is enlarged. The building could be constructed on the panel, or sectional, system so that it could be extended from time to time as

additional capacity is required. The plan is to provide for one unit at this time, with a capacity sufficient to heat the new agricultural buildings and the other buildings on the south half of the campus, and to continue the use of the

present heating plant for power for the shops and for heating Mechanical Hall, the Mechanic Arts building, and the Administration building. Plans for the proposed plant have been

Plan
Proposed.

carefully prepared and it is estimated that one section of the building, including re-enforced concrete stack, boiler with brickwork, piping and auxiliaries, with 800 feet of re-enforced concrete conduit 4 feet wide and 6 feet high, for the steam and water pipes, etc., will cost approximately \$45,000. By omitting the concrete stack, however, and substituting an iron stack therefor, and by reducing the boiler capacity

Cost of
One Unit.

to what is absolutely essential during the biennium, with some other slight changes, the cost can be reduced to \$35,000. Even this amount may seem large, but in reality it is not large when considered in connection with its importance to the institution and the amount that will be saved annually in the cost of heating the different buildings. It is small in comparison with what is expended by other institutions for similar plants. For example, three

Comparative
Cost.

years ago the Iowa State College received an appropriation of \$54,500 for a central heating plant. That institution, a year later, reported that this amount had proven "inadequate for even a partial construction of such a plant." Two years ago the Michigan Agricultural College, with a smaller attendance than the Oregon Agricultural College has, completed its central heating and lighting plant at a cost of \$140,000.

LAND. The need for more land for experimental and instructional work in the different departments of agriculture is referred to on page 62 of this report. The probable cost of the land most needed for these purposes is given in the appended estimates of departmental requirements. Atten-

tion is also called to the absolute necessity of purchasing additional land for the campus. As shown on the accompanying map, there are five small plats of ground extending south and east, between parts of the campus west of the

Administration building, east of the farm buildings and men's dormitory, and north of Waldo Hall. In order to join the parts of the

campus referred to, and to secure suitable room

for the buildings required, it will be necessary to purchase these tracts of land. The prices are continually advancing, so that it is important, not only as a matter of necessity but as a matter of economy, that arrangements be made to procure this land at the earliest possible date. There is another

tract of land comprising six acres, lying just south of the athletic field and Waldo Hall, east of the farm, and adjoining the C. and E. Railroad on the south, that is very much needed in order to get a suitable location for the Armory

and Drill Hall, the parade grounds, and the athletic field. The purchase of this land and the removal of the athletic field from its present

location would also make room for the proposed

central heating plant. Since the matter of negotiating for the purchase of land has been referred to a committee of the Board of Regents, no estimates are given here of the probable cost. The importance of obtaining the land, however, is presented for consideration in connection with the foregoing statements regarding other needs of the institution.

EXPERIMENT STATION. In addition to the room and equipment required for the experimental work, provision should be made for publications, and for the routine work referred to under Experiment Station. The

Adams Fund cannot be used for publishing the results of the investigations made, and it is necessary to meet the expense of these publica-

tions from other funds. An annual appropriation of from \$5,000 to \$7,000 a year should be made for these purposes.

It is recommended that the Legislature make a special appropriation to the Station of the amount required.

IMPROVEMENTS. A number of improvements should be made during the biennium. These are given in detail, with estimates of the cost, in the Appendices. Among the most important are the following: to connect Cauthorn Hall with the sewer, in order to make proper disposition of the sewerage from this building; to equip a fire department, to be organized among the cadets as a precaution against loss in case of fire in any of the buildings; to finish the interior of the new barn, providing a seed room, and putting a cement floor in the root cellar; to lay a large drain pipe north and south across the campus, between the east entrance and the Administration building, in order to fill the large open drain ditch now used, and thereby provide additional room for military drill; to improve the campus in the vicinity of Waldo Hall and the Agronomy building, and the walks and drives generally; to move the frame building now used by the department of Horticulture to the poultry grounds; to provide a new fence for most of the farm; and to make such changes in the old Agricultural building as may be required in providing additional room for the science work.

General
Improvements
Needed.

EQUIPMENT. The necessity for more live stock, laboratory, and other equipment, has already been referred to under the several departments. An itemized statement of the requirements is given in the list of departmental estimates. In preparing their reports on the equipment required, the heads of departments had frequent consultations with the President, and the amounts were reduced as much as possible, the items listed including such only as must be had in order to do efficient work.

Equipment.

REPAIRS. The amounts estimated for general repairs include the usual items of painting roofs, replacing old

steam pipes, repairing floors, painting woodwork, etc., in order to preserve the College property. As a matter of economy it is important that the buildings be kept in good repair. Many of the repairs contemplated for the next two years should have been made before; but, for want of funds, this has been impossible. The work cannot be delayed longer, however, without serious damage to some of the buildings.

Repairs.

MAINTENANCE. Beyond question, the greatest need of a growing modern institution is for an increasing maintenance fund. As a college develops, there is a continual

Rapid Increase in Maintenance Expense.

increase in the amount required for instructors, and for such miscellaneous items of expense as repairs, heat, light, janitorial service, supplies, miscellaneous improvements, maintenance of grounds, clerical help, library facilities. For example, the Iowa State College in 1901 expended \$4,000. in addition to the student janitorial fee, for heat, light, and janitorial service; in 1903, \$8,350; in 1904, \$12,572; in 1905, \$16,000; and in 1906, \$23,000. During 1906 the amount appropriated annually for repairs and improvements alone was increased from \$18,500 to \$30,000. The most pressing demand in the Oregon Agricultural College is for a much larger instructional force. For years

Larger Instructional Force Required.

the ratio of instructors to students has been much smaller than in other institutions. With the funds available, it has been impossible to increase the faculty as rapidly as the student enrollment has advanced. This deficiency is accentuated under present conditions by the large amount of advanced specialized work that is required in the different courses.

The estimated requirements, as given in the Appendices, may be summarized as follows:

FOR MAINTENANCE.

(One year.)

Additional professors, instructors, and assistants, including Industrial Pedagogy, Veterinary Science, Irrigation and Drainage, and Highway Engineering		\$47,775.00
Heat, light, and power, maintenance of campus, janitorial service, furniture, night watchman, printing and advertising, telephone and telegraph tolls, water tax, etc.		27,628.50
Maintenance of Library and purchase of books		6,225.50
Departmental and General Repairs.....		6,848.00
Miscellaneous supplies		4,027.50
Miscellaneous improvements		1,914.75
Present salaries, including all members of faculty, officers of Board of Regents, foreman heat and power plant, head janitor, assistant registrar, clerical help, etc.		75,135.00
		<hr/> \$169,554.25
<i>Less Income:</i>		
Interest land-grant, Morrill Act, 1862		\$11,500.00
Morrill Act, 1890		25,000.00
Nelson Act, 1907		15,000.00
Student fees (on basis of an attendance of 1,500)		7,500.00
State appropriation for maintenance..		50,000.00
		<hr/> 109,000.00
Balance		<hr/> \$ 60,554.25

All of the items included in the above are needed. To keep the amount even as low as it is, no provision is made for any increase in salaries. However, the requirements from the Legislature are such in the aggregate, including buildings and equipment, that it seems unavoidable that a still further reduction be made. By reducing the number of instructors in some of the departments, and omitting the instructors in foundry and wheelwright work; and by reducing the

Possible
Reduction.

totals listed for repairs and books, the aggregate amount can be reduced some \$10,000. But at best it is absolutely essential, in providing even for a fair degree of efficiency in the work of the different departments, and in meeting the large increase in the expense for heat, light, power, and other things that cannot be reduced, that the Legislature increase the appropriation for maintenance at least \$50,000 a year.

Appropriation
For
Maintenance
Needed.

FOR EQUIPMENT AND IMPROVEMENTS.

(Two years.)

Departmental equipment	\$80,614	
Miscellaneous equipment	9,208	
General improvements	9,995	
		<hr/> \$99,817

By following a course similar to that pursued in the reduction of the estimates for maintenance, and omitting all of the equipment listed for the foundry and wheelwright shop, the equipment for the fire department, and the amount required for draining the campus; and by an arbitrary reduction in the amounts listed for departmental equipment, probably the appropriation for equipment and improvements can be reduced to \$60,000 for the two years. But there should be no further reduction in this amount.

In accordance with the foregoing, the requirements from the State Legislature, exclusive of land and the appropriation referred to above for the Experiment Station, may be summarized as follows:

For maintenance, an increase per year of	\$ 50,000
For equipment and improvements, for two years.....	60,000
For buildings:	
Horticultural building and greenhouses.....	\$45,000
Central Agricultural building.....	55,000
Armory and Drill Hall	35,000
Central Heating Plant	35,000
	<hr/> 170,000

If an equal amount should be appropriated each year for buildings, equipment, and improvements, the following would probably be the best division:

1909—

Equipment and improvements	\$35,000	
Central Heating Plant	35,000	
Horticultural building and greenhouses..	45,000	
		<hr/> \$115,000

1910—

Equipment and improvements	\$25,000	
Central Agricultural building	55,000	
Armory and Drill Hall	35,000	
		<hr/> 115,000

These amounts in the aggregate may seem large; but they are really very conservative when compared with the amounts received for the same kind of work by other land-grant institutions. For instance, the total amount listed above for maintenance for the Oregon Agricultural College is \$159,000. This amount in proportion to student attendance is less than the income of the Washington State College for maintenance by \$84,000; the Iowa State College of Agriculture and Mechanic Arts, by \$127,000; the Michigan Agricultural College, by \$243,500; and Purdue University, by \$72,000. The statistics for the Iowa State College of Agriculture and Mechanic Arts and the Michigan Agricultural College are for the year ended June, 1906. More recent reports of these institutions would show a larger proportionate increase in the maintenance fund.

From statistics compiled by the U. S. Commissioner of Education and by the Office of Experiment Stations, a table has been prepared which is of interest as showing the amount expended per student by each of a number of representative land-grant institutions.

Table showing income of agricultural colleges for each of the five years ended June 30, 1903, to 1907 inclusive; the average annual income, the average annual enrollment, and the average cost per student for each institution for the five years; the income, the enrollment, and the cost per student for each institution for the year ended June 30, 1907; also the average annual income, the average annual enrollment, and the average annual cost per student for all of the institutions for the five years; and the average income, the average enrollment, and the average cost per student for all of the institutions for the year ended June 30, 1907. The income in each case does not include appropriations for experiment station.

INSTITUTION	ANNUAL INCOME					1903 to 1907 Inclusive			FOR YEAR 1907		
	1903	1904	1905	1906	1907	AVERAGE ANNUAL			Income	Enrollment	Cost per Student
						Income	Enrollment	Cost per Student			
California, University of.....	\$ 638,327	\$ 930,919	\$ 1,117,850	\$ 1,050,191	\$ 1,299,645	\$ 1,007,386	3,255	\$ 309.19	\$ 1,299,645	2,987	\$ 433.76
Colorado Agricultural College....	116,900	119,305	116,048	147,766	125,699	131,146	505	259.70	125,699	604	208.11
Idaho, University of.....	98,308	53,804	78,295	60,000	172,750	92,649	357	259.62	172,750	363	474.24
Purdue University (Indiana).....	219,610	243,917	329,790	303,343	328,592	285,050	1,630	174.87	328,592	1,820	180.54
Iowa State College.....	266,792	334,407	446,212	547,819	480,281	415,102	2,008	207.22	480,281	2,381	201.69
Kansas Agricultural College.....	113,331	213,357	151,834	203,630	236,535	183,618	1,655	110.94	236,535	1,937	122.11
Massachusetts Agricultural Col..	150,559	46,528	82,416	126,828	166,631	102,592	238	431.05	166,631	279	346.37
Michigan Agricultural College....	226,425	238,900	244,865	288,600	370,292	273,816	917	289.14	370,292	1,001	369.92
Montana Agricultural College....	60,112	69,386	65,844	57,838	106,235	71,883	347	207.15	106,235	372	284.50
Ohio State University.....	533,104	582,361	477,611	690,985	612,491	579,310	1,929	300.32	612,491	2,277	268.99
Oregon Agricultural College....	76,807	64,147	63,943	68,923	112,511	77,086	664	116.09	112,511	833	135.06
Washington State College.....	111,533	110,356	117,110	127,837	337,330	160,833	844	190.56	337,330	1,100	306.66
Total.....						\$3,380,471	14,379	\$2,856.05	\$4,288,992	15,954	\$3,331.95
Average.....						\$ 281,706	1,198	\$ 238.00	\$ 357,416	1,329	\$ 277.66

Statistics for years 1903 to 1906 inclusive taken from reports of U. S. Commissioner of Education.

Statistics for 1907 taken from bulletin prepared by Office of Experiment Stations, U. S. Department of Agriculture, 1908.

From this table it will be observed that the average cost per student during the five years was \$238. The average for the year 1906-1907 was \$277.66. On the basis of the average cost per student given in this table, the Oregon Agricultural College should receive during the next two years, in addition to the entrance fees and the income from the Federal Government, \$790,800; on the basis of the income of the Michigan Agricultural College, in proportion to attendance, the Oregon Agricultural College should receive \$1,097,200. It will be seen, therefore, that, should the Oregon Agricultural College receive the appropriations requested, for maintenance, equipment, improvements, and buildings, the aggregate would then be but 54 per cent of the amount it should receive on the basis of the average income per student of the institutions named in the above table; and only 39 per cent, in proportion to students, of the income of the Michigan Agricultural College. It should be remembered, also, that a large part of the appropriation requested for the two years is to be expended for buildings, equipment, and improvements, which will add to the permanent value of the plant, and should not, therefore, be charged against the students in attendance during the years for which the appropriations are made.

Respectfully submitted,

W. J. KERR,

President of the College.

January 6, 1909.

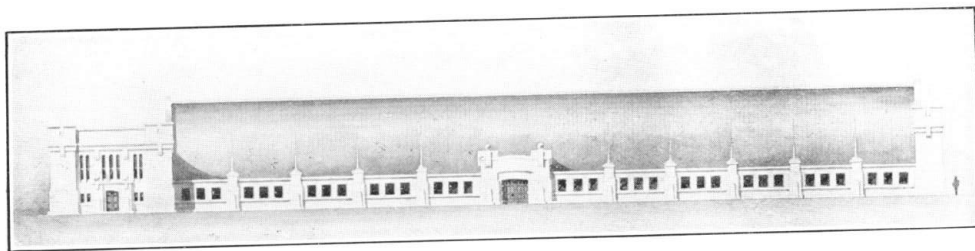


Horticultural Building

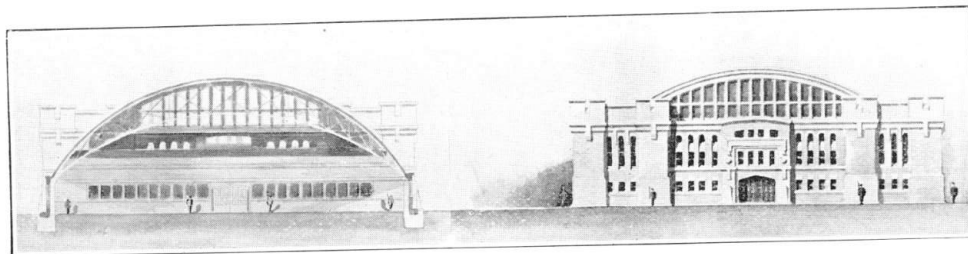
Central Agricultural Building

Agronomy Building

Proposed new Agricultural Building. The right wing, or Agronomy Building, is completed



Side View



Sectional View Showing Style of Roof

Front End View

Views of the proposed Armory and Drill Hall

APPENDICES

- 1—Report of the Dean of the School of Agriculture.
- 2—Report of the Dean of the School of Domestic Science and Art.
- 3—Report of the Dean of the School of Engineering and Mechanic Arts.
- 4—Report of the Dean of the School of Commerce.
- 5—Report of the Department of Forestry.
- 6—Report of the Department of Pharmacy.
- 7—Report of the Librarian.
- 8—Report of the Registrar.
- 9—Report of the Director of the Experiment Station.
- 10—Report of the Farmers' Institutes.
- 11—Report on Heat, Light, and Power.
- 12—Itemized Estimates of Requirements.

REPORT OF THE DEAN OF THE SCHOOL OF AGRICULTURE.

To the President of the College,

Sir: In accordance with your request I present, herewith, a report of the instruction in Agriculture during the years 1906-7, 1907-8, and 1908-9, together with recommendations for the School of Agriculture for 1909-1911.

The past two years have witnessed a remarkable development in agricultural instruction at the Oregon Agricultural College.

During the school year 1906-7, all of the instruction in agriculture was done by three men whose time and energies were necessarily very largely occupied by Experiment Station work, Farmers' Institutes, Winter Short Courses and correspondence.

Under such circumstances comparatively little instructional work could be given and no opportunity whatever could be provided for students who desired to specialize. But one course leading to a degree was open to agricultural students and in that course, in which 285 term credits were necessary for graduation, but 40 credits (14 per cent) in Agriculture were required, viz.: Animal Husbandry 15, Horticulture 10, Dairying 7.5, and Agronomy 7.5. In addition to the degree course, however, there were offered during the year a winter short course of two weeks and a special course of six weeks in Dairying.

Number of agricultural students enrolled 1906-7:

In degree course	80
In winter short courses	56
Total	<hr/> 136

Notwithstanding the fact that the enthusiasm of teachers and students for the work produced good results, it had long

been evident that material additions must be made to the teaching force and to the facilities for instruction; and that the agricultural course must be thoroughly revised and expanded before it could be expected to attain the position which rightfully belongs to it in such an institution.

Upon assuming the duties of President, you recognized the above facts by recommending the establishment of departments of Agronomy, Animal Husbandry, Dairy Husbandry, and Poultry Husbandry, at once, and of Veterinary Science as soon as practicable. Two professors and one instructor were engaged, thus increasing the teaching force from three to six persons; and an Agricultural Committee was appointed, one of the duties of which should be to revise the courses of instruction. This was accomplished with the hearty co-operation of all members of the agricultural faculty and at the opening of the school year 1907-8, a small catalogue descriptive of the revised courses was ready for the use of students.

The course as adopted provided that of the 264 term credits necessary for graduation, 90 (34 per cent) may be for purely agricultural subjects in addition to those allowed for the foundation sciences.

During the year (1907-8) the various departments offered a total of 50 courses of instruction in agriculture with an aggregate of 169 term credits as compared with the 10 courses and 40 credits of the previous year.

It may also be of interest to note that when given the opportunity of electing such a large proportion of purely technical subjects all of the students not only made full use of it but most of them registered for more than the required number of credits.

In addition to the courses for regular students the following short courses were also offered during the year:

- A Summer School of Agriculture for Teachers (1 week).
- A Winter Short Course in General Agriculture (2 weeks).
- A Winter Short Course in Dairying (6 weeks).
- A Winter Short Course in Horticulture (6 weeks).

The number of agricultural students enrolled during the year 1907-8 in the various courses was as follows:

I: Degree Courses	100
In Winter Short Courses	70
In Summer School of Agriculture	63
Specials in Agriculture	6
Graduates	3
Total	242

The Board of Regents, for administrative purposes, having authorized the grouping of the various departments of instruction into four schools, at the beginning of the year 1908-9 the following departments were organized into a School of Agriculture, viz., Agronomy, Animal Husbandry, Dairy Husbandry, Poultry Husbandry, Horticulture, and Entomology.

For the current year, 1908-9, the School of Agriculture offers the following courses:

1. A two years' course in Elementary Agriculture.
2. A four years' course leading to the Degree of Bachelor of Science.
3. A ten weeks' Winter Course in Dairying.
4. A six weeks' Winter Course in Horticulture.
5. A two weeks' Winter Course in Creamery Practice.
6. A Farmer's Week.

ELEMENTARY COURSE.

The two years' course which is offered this year for the first time is provided especially for those who have no opportunity to pursue their public school course beyond the eighth grade, or who, from necessity or choice, desire upon completing the work of this grade, to obtain as quickly as possible a working knowledge of the principles of agricultural science and practice. The technical instruction given during the course includes courses in Agronomy, Animal Husbandry, Horticulture, Dairy Husbandry, Botany, Physiology, Business Administration, Drawing, Woodwork, and Blacksmithing. Courses in English, Mathematics and

History are provided so that students who finish this course and who so desire may be fully prepared to enter upon the Degree Courses.

In this connection I desire to call especial attention to the opportunities offered by the technical portions of this course for teachers to prepare themselves to teach elementary agriculture in the public schools. Such persons, upon registering as special students, may be allowed to elect a full complement of courses in agriculture and thus be enabled to obtain a maximum of technical training in a minimum of time.

The course in Elementary Agriculture which is now being given for the first time is as follows:

	<i>Semesters.</i>	
	<i>First.</i>	<i>Second.</i>
<i>First Year—</i>		
English	5 credits	5 credits
Mathematics	5 credits	5 credits
History	3 credits	3 credits
Animal Husbandry	2 credits	
Agronomy	1 credit	1 credit
Horticulture	2 credits	2 credits
Dairying		2 credits
Drawing (Freehand)	2 credits	2 credits
<i>Second Year—</i>		
English	5 credits	5 credits
Mathematics	5 credits	5 credits
Animal Husbandry	1 credit	2 credits
Business Administration	2 credits	2 credits
Dairying	2 credits	
Agronomy		2 credits
Botany		2 credits
Physiography	3 credits	
Shopwork	2 credits	2 credits

DEGREE COURSE.

The Board of Regents having advanced the entrance requirements and the college year having been divided into two semesters, instead of three terms, as hitherto, it again became necessary at the beginning of the year to revise the degree course of study. Advantage was taken of this oppor-

tunity to strengthen the course materially by providing more work in the basic sciences without reducing the amount of work in agriculture. As finally adopted the course is as follows:

	<i>Semesters.</i>	
<i>Freshman Year—</i>	<i>First.</i>	<i>Second.</i>
English (Rhetoric and Classics)	5 credits	5 credits
Mathematics (Trigonometry)	3 credits	
Chemistry	4 credits	4 credits
Botany		3 credits
Zoology	3 credits	
Agronomy	3 credits	2 credits
Horticulture		2 credits
Animal Husbandry		2 credits
Shopwork	2 credits	2 credits
<i>Sophomore Year—</i>		
Physics	4 credits	4 credits
Modern Language	4 credits	4 credits
Economics		3 credits
Botany	3 credits	
Zoology	3 credits	3 credits
Agronomy		3 credits
Horticulture	3 credits	
Animal Husbandry		3 credits
Dairy Husbandry	2 credits	
Bacteriology	1 credit	

All of the work for the first two years is required and is the same for all agricultural students. To provide opportunity for specializing, students are allowed at the beginning of the junior year to elect a major and one or more minor subjects upon consultation with the head of the department in which the major is taken. Thus students who desire to specialize in Agronomy, Animal Husbandry, Dairy Husbandry, Horticulture, etc., may in addition to the general agricultural work of the first two years, devote a large proportion of their time during the last two years to subjects directly related to their chosen work, the various subjects being elected, however, on consultation with a member of the faculty. In this connection, however, it is interesting to note that in choosing their major and minor electives the

students invariably select agricultural subjects or some closely related branch of science.

One hundred and forty-four semester credits are required for graduation from the course as now given, of which sixty-eight, or approximately fifty-seven per cent, may be taken in the various agricultural subjects. This is, however, a larger proportion of agricultural work than is usually recommended by the instructor under whom the student elects his major.

It should be noted that the various subjects of instruction may be conveniently arranged into the three following groups, each of which should require approximately one-third of the student's time: (a) sciences related to agriculture, *i. e.*, Botany, Zoology and Entomology, Chemistry, Physics, and Bacteriology; (b) technical agricultural subjects, *i. e.*, Agronomy, Animal Husbandry, Dairy Husbandry, Horticulture, Poultry Husbandry, and Veterinary Science; (c) non-technical subjects, *i. e.*, English Language and Literature, Mathematics, History, Economics, Modern Languages, Drawing and similar subjects.

The subjects of the first group are designed to furnish the student with an insight into the principles of the agricultural sciences. In the second group he learns of the application of these principles and also studies, both theoretically and practically, various subjects of agricultural technology. The subjects of the third group tend to further develop the student's intellect, broaden his view and train him in good citizenship. To indicate briefly the nature of the work, it may be stated that in the courses in Agronomy the student studies the origin, structure, fertility, cultivation, and improvement of various soils; the history, growth, culture, improvement, and value of the different field crops; the structure, machinery, drainage, and irrigation of the farm, and the history, economics, methods, and business principles of farm management. There is also a thorough course in Business Administration, which will be given by the department of Commerce. In the course in Animal Hus-

bandry consideration is given to the history and characteristics of the various breeds of live stock; the principles of breeding; the principles and practices of feeding, with particular reference to conditions in this State; and by almost constant practice in stock judging the student is made familiar with the good points of the various breeds. In Horticulture the student studies the problems of the orchard and garden; such as choice of site, soils, planting, pruning, choice of varieties, sprays and spraying, and thinning; he obtains instruction and practice in the propagation of plants by various methods; in the harvesting, packing, storage and marketing of fruits; he may study the principles of plant breeding or the construction and management of green-houses or the culture of small fruits and vegetables for market or canning purposes. In Dairy Husbandry he studies the secretion, composition, and separation of milk; the proper handling of milk and cream; and obtains abundant practice in the use of the Babcock and other tests, in butter and cheese making and in creamery practice. A department of Poultry Husbandry has recently been organized and offers to students exceptional opportunities to specialize along this line. The instruction will include a study of breeds, the principles of feeding, housing and incubation, and will be supplemented by practical work on the farm. The organization of a department of Veterinary Science has been authorized by the Board of Regents, but no course of instruction will be given during the school year, 1908-9.

The aim of the two and four years' courses is to train young men to become successful farmers, stockmen and fruit growers; to prepare them to become specialists in some branch of agricultural college or experiment station work, or to fit them to become teachers of agriculture in the public schools. In short, they offer, to those who have faith in the farm and in rural life opportunities for intellectual development and technical training equal to those provided for education for other professions.

The various departments are offering the following courses of instruction.

	<i>Semesters.</i>	
	<i>First.</i>	<i>Second.</i>
<i>Agronomy—</i>		
1. Soils	1 credit	1 credit
2. Crops		1 credit
3. Mechanics		2 credits
4. Basic Agronomy	3 credits	
5. Crop Production		2 credits
6. Irrigation and Drainage		3 credits
7. Soil Physics	5 credits	
8. Cereal Crops	5 credits	
9. Farm Mechanics		5 credits
10. Climatology		2 credits
11. Soil Fertility	5 credits	
12. Agrostology	5 credits	
13. Farm Management		5 credits
14. Advanced Work	5 credits	5 credits
<i>Animal Husbandry—</i>		
1. Breeds of Farm Animals	2 credits	
2. Veterinary Science		1 credit
3. Care of Farm Animals		2 credits
4. Breeds of Stock		2 credits
5. Stock Judging		3 credits
6. Market Types	3 credits	
7. Market Types		3 credits
8. Herd Management, Range and Farm		2 credits
9. Principles of Breeding	4 credits	
10. Stock Feeding	5 credits	
11. Beef Production		1 credit
12. Pork Production		1 credit
14. Mutton and Wool Production		1 credit
15. Research Work		3 credits
<i>Dairy Husbandry—</i>		
1. Farm Dairying		2 credits
2. Farm Dairying	2 credits	
3. Milk and Cream Testing	2 credits	
4. Advanced Butter Making	5 credits	
5. Cheese Making		3 credits
6. Research Work	2 credits	
7. Factory Management	3 credits	3 credits
8. Technology of Milk		2 credits

9. Preparation of Ice Cream and Ices	1 credit	1 credit
10. Thesis		2 credits
11. Home Dairying		3 credits

Horticulture—

1. Elementary Orchard Practice	2 credits	
2. Elementary Plant Propagation and Vegetable Gardening		2 credits
3. Plant Propagation		2 credits
4. Orchard and Garden Practice.....	3 credits	
5. Practical Pomology	3 credits	
6. Orchard Practice	2 credits	
7. Orchard Practice		2 credits
8. Floriculture	2 credits	
9. Grape Growing	2 credits	
10. Small Fruit Culture		3 credits
11. Nut Culture		2 credits
12. Landscape Gardening		2 credits
13. Systematic Pomology	2 credits	
14. Commercial Pomology	2 credits	
15 and 16. Seminar	1 credit	1 credit
17. History and Literature of Horti- culture	2 credits	
18. Plant Breeding		4 credits
19. Sub-tropical Pomology		2 credits
20. Principles of Vegetable Garden- ing	4 credits	
21. Greenhouse Construction		3 credits
22. Forcing Vegetables	4 credits	
23. Systematic Olericulture	1 credit	
24. Truck Gardening		5 credits
25. Annuals and Perennials	3 credits	
26. Forcing Flowers		4 credits
27. Plant Materials	2 credits	
28 and 29. Theory and Design.....	3 credits	3 credits
30. Field Practice in Landscape Gardening		2 credits
31. Floriculture	3 credits	
32. Landscape Gardening		3 credits
33. Vegetable Gardening and Small Fruit Culture		3 credits

Poultry Husbandry—

1. Poultry Husbandry	2 credits
2. Poultry Management	2 credits

Zoology and Entomology—

4. Anatomy and Physiology of Domestic Animals	3 credits	3 credits
6. General Entomology	5 credits	
7. Advanced Entomology		5 credits
8 and 9. Advanced Entomology.....	5 credits	5 credits
10 and 11. Crop Pests	3 credits	3 credits
12. Animal Parasites		1 credit

There are thus being offered during the present year a total of eighty-three courses of instruction in agricultural subjects with a total of two hundred and forty-three semester credits. This is nine times the amount of instruction in agriculture that was being given at the beginning of the biennium covered by this report. It should also be noted that the opportunity for work in Bacteriology, Botany, Chemistry, Physics, and Zoology, subjects which form the basis of agricultural science, has also increased in like proportion but is not included in this report since the departments in which this work is given are not included in the School of Agriculture.

The number of agricultural students registered to date (December 1, 1908), in the various courses is as follows:

In Degree Course	127
In Elementary Course	34
Specials in Agriculture	9
Total	167

The increase in the number of regular students registered to date is thus 53 per cent over the total for last year.

INCREASED FACILITIES NECESSARY.

Notwithstanding the fact that the instructing force has been increased during the biennium from three to ten persons and that to the facilities for instruction have been added a well equipped poultry plant, a splendid Agronomy building, which contains some of the best equipped laboratories for work in Agronomy to be found in this country, and an attractive and well equipped dairy barn, the in-

crease in the facilities for instruction has not kept pace with the development of the work. The room available for instruction purposes has approximately doubled, the teaching force has trebled, while the amount of instruction given has increased nine-fold.

REQUIREMENTS BY DEPARTMENTS.

Agronomy.

When installed in the new Agronomy building, this department will be well provided for, having what are probably the best laboratories of the kind in the West, if not in the whole country. Sufficient space is not available in this building, however, to house the machinery used in the course in Farm Mechanics and eventually a separate building may be needed for that purpose, although, for the present, one wing of the dairy barn may be used.

Another instructor for the department is necessary. At present the management of the College farm, the experimental work with soils, cereal crops, forage crops, irrigation and drainage, a heavy correspondence, and more than thirty semester hours of instruction per semester fall upon the head of the department and one assistant. By reason of the broad range and fundamental nature of the subjects taught under the name of Agronomy, this department should be provided with a sufficiently large instructing force to make it one of the strongest in the institution. In some other institutions, the subjects taught in our department of Agronomy are assigned to several departments, each with a much larger instructing force than has our own. For the present, however, the work can be provided for by employing one additional instructor.

Animal Husbandry.

In presenting the needs of this department I can do no better than to quote from Dr. Withycombe's report:

"There has been an increase of 44 per cent in the number of students in the department of Animal Husbandry this year and at this rate of increase it is reasonable to presume

that there will be at least 200 regular students taking work in the department in 1911.

"Agriculture is the basic wealth of this state and the live stock industry is the very foundation of successful agriculture. Thus any reasonable amount of money invested to promote a greater interest in this great industry is certainly money well expended.

"The real needs of the department are, first, more first-class live stock; second, additional class rooms and another instructor; third, a judging pavilion. By far the greatest present need is more live stock. The College and Station has a good herd of Jerseys and Shorthorns, Yorkshire and Berkshire swine, and a good flock of Cotswold and Shropshire sheep. But for thorough work in Animal Husbandry there should be a greater number of breeds represented so that students can have a much wider range of work and become familiar with practically all of the leading breeds of stock."

The judging pavilion, while it is greatly needed, can, as intimated by Dr. Withycombe, be dispensed with for the present; but the large number of students electing work in the department makes the employment of another instructor almost imperative, and the magnitude of the live stock industry in the state, with the great importance of the work given, should certainly justify the expenditure of at least \$5,000 for good types of a number of breeds not now represented in the College herds.

Dairy Husbandry.

As soon as possible a dairy building should be provided for the department of Dairy Husbandry. The present quarters are not only already crowded to the limit, but are entirely unsuited to the work. Professor Kent calls attention to the fact that "refrigeration in modern creamery practice calls for machinery that could not be properly installed" in the present quarters. "The sewerage arrangements at the present time are very undesirable; the heating conditions are objectionable, for the pipes for the entire Agricultural Hall pass through the main work room, thus overheating it when it should be cooled; the cheese-curing rooms do not

afford proper control of temperature and moisture; and the close proximity of a chemical laboratory further adds to the unsuitable location of the present quarters."

A building suited to the needs of the department—one that would give "opportunity for proper instruction in milk and cream testing, butter making, cheese making, market milk, farm dairying, cream refrigeration, ice cream making, etc., etc., along practical commercial lines and including the operation of a commercial creamery" should, when fully equipped, cost not less than \$65,000.

Such a building would enable the Oregon Agricultural College to conduct the best dairy school west of the Rocky Mountains, and would be a proper recognition of the greatest single industry of the state.

While such a building is greatly needed and must be provided before the dairy courses can be developed to a high standard, I believe that in the interests of economy we should for the present do the best possible with the present quarters and equipment. I would recommend, however, that as soon as the department of Animal Husbandry can be properly equipped with live stock, the entire management of the dairy herd be transferred to the department of Dairy Husbandry.

Horticulture.

The department of Horticulture is well provided with instructors; and is doing good work. The facilities for instruction, however, are very poor. With the most meager office and class-room accommodations; with no spray laboratory, propagating rooms, packing-room or storage facilities; with practically no greenhouse facilities; with but a small orchard and no propagating grounds, the work of the department is seriously handicapped. I believe that it is due to the large number of students who are specializing in horticulture as well as to the horticultural interests of the state that a suitable appropriation be made by the incoming legislature to provide this department with the neces-

sary building, greenhouses, and land for orchard purposes. A horticultural building suitable for the work and with adequate greenhouse facilities could be built, probably, for about \$60,000. Not less than \$5,000 should be invested in orchard lands. Even then the acreage available for orchard purposes would be far less than at many similar institutions in other states, some of which have horticultural possibilities greatly inferior to those of Oregon.

Poultry Husbandry.

The department of Poultry Husbandry is well equipped. Some assistance in teaching may be necessary and several additional rooms are needed for various purposes. I believe, however, that satisfactory quarters can be provided for all of the work without the erection of an additional building.

Veterinary Science.

During the past two years a number of students have applied for registration in a course in Veterinary Science. In view of the great importance of the live stock and dairy industries to the state and particularly in view of the rapid increase in the number of highly bred animals in the state—animals which it is to the state's interest to protect, I believe provision should be made to at once organize a course in Veterinary Science at this institution.

Respectfully submitted,

A. B. CORDLEY,

Dean of the School of Agriculture.

REPORT OF THE DEAN OF THE SCHOOL OF
DOMESTIC SCIENCE AND ART.

To the President of the College,

Sir: In July, 1908, the department of Household Science was re-organized as the School of Domestic Science and Art, and placed under the direction of a Dean, who also has the

management of Waldo Hall, the women's dormitory. To assist the Dean in the work of instruction, three instructors were employed as follows: Marian S. Van Liew as instructor in cookery, serving, dietetics, marketing, and laundry work; Helen H. Tobin, to teach plain hand and machine sewing, dressmaking, tailoring; Ariel Ewing, for the work in house construction, household decoration, hand work, basketry, weaving, and millinery. However, on account of the large increase in attendance and the consequent increase in the amount of work called for, it was found necessary in November to employ another instructor to assist in the work of cookery, and Myrtie Van Deusen was secured for this work. The two instructors in cookery make it possible to carry out an excellent plan for this work in connection with the dormitory, as these instructors have charge of the catering, marketing, and the general oversight of the kitchen, pantries, and dining room, the cooks and waitresses being responsible to them. This makes possible a valuable co-operation between the work of the department and the dormitory.

The enrollment in the household science work has increased very materially during the last two years. In 1906-1907, there were registered in this department 81 students; in 1907-1908, the total registration was 155, including 29 students in the winter course; while, on November 1, 1908, there are in all 177 students registered in the School of Domestic Science and Art, and there will no doubt be from 30 to 50 register for the work in the winter course. The students during the present semester are distributed as follows: elementary, 19; freshmen, 62; sophomores, 34; juniors, 22; seniors, 19; and post-graduates and specials, 21. During the year 1909-1910, it is estimated that 200 students will pursue the work of this school; and 225 during the year 1910-1911.

During the present semester there are being offered 13 different courses, in 27 sections, with a total of 554 students, as follows:

<i>Course.</i>	<i>Students.</i>	<i>No. of Sections.</i>
Principles of Cookery	116	5
Advanced Cookery	35	3
Plain Sewing	99	4
Dressmaking	30	2
Tailoring	11	1
Millinery	47	2
House Construction	34	2
Basketry and Weaving	21	1
Costume and Design	4	1
Nature Study	110	3
Bacteriology	23	1
House Sanitation	16	1
Normal Methods	8	1

During the semester the students have been given theoretical and practical instruction in the cleaning, management, and arrangement of the kitchen; in the preparation of special dishes for use in the dormitory dining room, such as breads and the more common foods, puddings, salads and dressings; in the canning and preserving of different kinds of fruits, jellies, jams, etc. They have also been given instruction and training in the preparing and serving of meals. The plan of the work for students who have studied cookery one year has been to give them an opportunity to review operations, to gain facility, and to show their need in such work, at the same time to introduce new ideas and operations, and to extend their knowledge to an appreciation of wise selection and combination of foods, giving consideration to both the dietetic value and the cost, as well as to the taste and attractiveness. With this purpose in view, the class planned, cooked, and served a number of meals, the type of which is illustrated by the following menus: supper prepared for 13 people, consisting of beefroll, French fried potatoes, escalloped tomatoes, baking powder biscuits, apple charlotte, hard sauce, and tea, the total cost being \$1.75, or 14 cents per capita; luncheon for 14, consisting of tomato bisque, crautons, macaroni with cheese, corn bread, and cocoa, total cost \$1.32, or 9.4 cents per person; luncheon

for 14, consisting of stuffed peppers, creamed potatoes, raised biscuits, celery, apple salad, and tea, at a total cost of \$1.17, or 8.3 cents per capita. These same students will plan menus for all types for people in health and in sickness, for family and for dormitory use, calculating the exact cost and dietetic value, considering also the best season for purchase time, and the difficulties of preparation and keeping qualities.

In Domestic Art students are given work in plain sewing for both hand and machine, drafting, making of undergarments and simple dresses; dressmaking and tailoring, designing, cutting and in making costumes for various occasions, including tailored suits, tea and evening gowns, etc. Special consideration is given to costume design and other important factors which should determine the selection and planning of a wardrobe, with sketches of gowns and hats for various occasions. Other work in this department includes lectures and recitations on principles of house furnishing, considering first the house as a whole and then the various rooms, making practical applications by furnishing different rooms in Waldo Hall, with special consideration for arrangement for both convenience and beauty, selection of materials for furnishings, woodwork, papering, furniture, rugs, curtains, colors, appropriateness, expense, etc.

In the science work in the School of Domestic Science and Art special attention is given to an appreciation of the reality of bacteria and allied organisms such as yeasts and moulds, their function in the world, their place in nature's food cycles, their agency in disease, the dependence of real cleanliness upon them, how their growth may be encouraged when desired or discouraged or prevented entirely; also a consideration of such problems as the best and least expensive methods of heating, ventilating and lighting, good plumbing and systems for supplying hot and cold water and carrying away of waste water, all instruction, so far as possible, being supplemented by practical application and a thorough understanding of the fundamental physical and bacteriological principles involved.

However, these courses offered by the School of Domestic Science and Art would not be at all adequate to give a thorough and broad education unless strengthened by good courses in English, history, mathematics, art, and the natural sciences. An intelligent study of cookery, must be based upon a scientific knowledge of the sciences such as chemistry, physics, physiology, and bacteriology, while sewing and all domestic art work must be based upon thorough training in art principles. Therefore, the curriculum planned for the school includes extended academic work as well as the practical work. High ideals, skill in manipulation, time saving methods, are emphasized in all of the work. Classes in cookery are taught the preparation of all common foods with a thorough study of the underlying principles involved in the processes of cooking and in the combining of various foods to give proper nutrition in health at different ages and under different disease conditions. Menus are suggested, cooked, served, eaten, and criticized by the students. Through class and practical work the student learns the best methods of work for obtaining real cleanliness throughout the home, house cleaning, laundry work, and personal hygiene receiving a careful consideration based upon bacteriological principles.

In the work in domestic art the student should learn and be interested in making dresses and hats for various occasions. The work itself should show appreciation of constructive art principles and high ideals in technique. Other forms of work, such as art needle work, basketry and weaving, enable the student to gain muscular control, guided by careful thought, and to produce useful and beautiful articles; while the work in house construction should enable her to know what is desirable and beautiful in a home and to help her to see the possibility of having an artistic, convenient, and inexpensive house surrounded by trees, flowers and vegetable gardens, making, as a whole, an attractive home—a valuable addition to any community.

The work of the school should enable a woman to reach her greatest possibilities along the line of her natural and life directed interests, to develop and broaden the interests of a well furnished mind, to secure perfection in technique in the production of suitable and beautiful articles—the material furnishing of a life of culture. The course of study offered in the school should make of the young woman we graduate not only a woman of culture, but she should know, and be interested in knowing, the influence a well ordered daily life has upon happiness and usefulness in the world. She should know how to make a home beautiful in arrangement and furnishing, and be interested in making it so. She should know what foods, what quantity and preparation, is best, in health and in sickness, for both infants and mature people. She should be a power for good, holding high ideals, ready, able, and willing, to help in advancing her community to its greatest possibilities; and the advanced work should enable her to cope successfully with the problems of professional work for which the courses are planned,

Respectfully submitted,

JULIET GREER,

Dean of the School of Domestic Science and Art.

REPORT OF THE DEAN OF THE SCHOOL OF ENGINEERING AND MECHANIC ARTS.

To the President of the College,

Sir: In submitting my first report as Dean of the School of Engineering and Mechanic Arts, I am reminded that this report must largely consist of an outline of plans for the future instead of a record of past achievements.

The school organization includes all of the work in the departments of Engineering and Mechanic Arts. Four distinct courses leading to the degree of Bachelor of Science

in Engineering are given as follows: (1) Civil Engineering, (2) Electrical Engineering, (3) Mechanical Engineering, (4) Mining Engineering; (5) also a two-year course in Mechanic Arts not leading to a degree.

These departments are all in a flourishing condition, so far as attendance of students is concerned. However, the growth of the College has been so rapid during the past few years that the engineering departments have not been able to provide equipment and teaching force rapidly enough to supply the increasing demands.

The growth has been most marked during the past three years, when the number of students enrolled in engineering courses and in Mechanic Arts has increased from 199 in 1906-7 to 444 in 1908-9,—a gain of 123 per cent. Also in 1906-7 the engineering students constituted 23.9 per cent of the total registration; in 1907-8, 31.3 per cent, and now 41.8 per cent of all students enrolled in the College are in the School of Engineering and Mechanic Arts.

The distribution among the several courses is as follows: Civil Engineering, 108; Electrical Engineering, 157; Mining Engineering, 50; Mechanical Engineering, 76; Mechanic Arts, 53; total, 444. Each of these departments has its legitimate place in the educational work of the College and in the industrial development of our commonwealth.

CIVIL ENGINEERING.

In the development of a comparatively new country like the Pacific Northwest, no branch of engineering skill is called upon oftener than that of civil engineering. The surveying, platting and dividing of vast areas of field and forest; the location and construction of wagon roads; the building of steam and electric roads; the draining of swamp or low lands; the irrigation of arid lands, are some of the processes that demand engineering skill at the very outset. Later, with the building of cities and towns comes the further applications of the principles of civil engineering in municipal and sanitary engineering; in designing and con-

structing water and sewer systems; in paving streets, building bridges, and developing water power. Manifestly, the agricultural and industrial development of a country are very closely associated with the work of the civil engineer.

At the meeting of the Board of Regents in July, 1906, the preliminary steps were taken for the organization of the course in Civil Engineering, but owing to the very limited teaching force and the inadequacy of funds at command very little more was done than to make a beginning. A year later Civil Engineering became a department and since that time its growth has been almost phenomenal. The following is an exhibit of the instructional work being done in the department of Civil Engineering for the year 1908-1909:

<i>Subject</i>	<i>Course No.</i>	<i>Credits</i>		<i>Students</i>	<i>Sections</i>
		<i>1st Sem.</i>	<i>2d Sem.</i>		
Sanitary Engineering....	12	3		4	1
Roofs and Bridges.....	10	4		2	1
Roofs and Bridges.....	11		4	2	1
Highway Construction ..	8	5		14	1
Masonry & Foundations	9		5	14	1
Irrigation Engineering..	14		4	1	1
City and Topographic					
Surveying	5	3		20	1
Railroads	6	1		21	1
Railroads	7		5	21	1
Agricultural Surveying..	3		3	10	1
Surveying	2		5	70	3
Seminar	16&17	1	1	13	1
Engineering Contracts					
and Specifications	15		1	8	1

ELECTRICAL ENGINEERING.

No branch of engineering has made more rapid or extensive advancement during the last twenty years than electrical engineering. Electricity in the home has ceased to be a luxury, enjoyed only by the wealthy dweller in the city, and has become a necessity even in modest homes throughout our land. Nothing offers greater inducement to the residents of cities to establish homes in the country than the

numerous interurban electric lines binding together our cities and towns. Our state has exceptional advantages for the development of electric power. Rapid mountain torrents fed by perpetual snows are available in nearly all parts of the state for the cheap production of electric current. There is power enough of this kind, now going to waste, to operate a network of electric roads covering the entire state; and to do much of the drudgery in thousands of homes that is now done by hand. The development of this asset will do much towards the advancement and prosperity of the whole state. It is the special province of the electrical engineer to extend the use of this subtle agency and bring it within the reach of all.

The following is an exhibit of instructional work being done in the electrical department for the year 1908-1909:

<i>Subject</i>	<i>Course No.</i>	<i>Credits</i>		<i>Students</i>	<i>Sections</i>
		<i>1st Sem.</i>	<i>2d Sem.</i>		
Dynamo-Electric Machinery	1& 2	3	3	36	2
Elements of Electrical Engineering	3& 4	3	3	28	1
Dynamo Design	9&10	3	3	28	2
Electrical Engineering Laboratory	7		2	28	5
Power Plants	10	3		5	1
Power Plant Design	11		3	5	1
Electrical Laboratory	5& 6	2	2	36	5

MECHANICAL ENGINEERING.

The people of this and adjoining states are still content to ship vast quantities of manufactured goods across the continent, paying heavy tribute to the railroads for freight charges, instead of building up home manufacturies. It is to be expected that development along this line will be somewhat tardy since a country must be well settled before there is a great demand for manufactured products. Some progress has been made in manufacturing industries, but very little compared to future possibilities. It is the purpose of the course in mechanical engineering to fit young men to

take an active part in this work. The design of machines; study of engineering materials; the economical production of power by steam or gas engines; the installation and operation of complete plants, are some of the things with which the mechanical engineer is expected to be familiar.

Following is an exhibit of the work being done in the department of Mechanical Engineering and Mechanic Arts for the year 1908-1909:

<i>Subject</i>	<i>Course No.</i>	<i>Credits</i>		<i>Students</i>	<i>Sections</i>
		<i>1st Sem.</i>	<i>2d Sem.</i>		
Woodwork	19&20 &21	3	3	192	5
Woodwork	22&23	5	5	53	1
Blacksmithing	28&29	3	3	72	3
Blacksmithing	32		2	53	2
Machine Shop	35&36	3	3	50	3
Mechanical Drawing	3	3	3	93	3
Mechanical Drawing	1		3	107	3
Descr. Geometry	2	3		90	3
Mechanism	4		4	25	2
Materials of Engineering	8	2		29	1
Statics and Dynam.....	5	4		52	2
Strength of Materials..	6		2	52	2
Hydraulics	7		2	52	2
Machine Design	13&14	4	4	11	1
Engineering Lab.	11&12	2	2	18	3
Steam Machinery	10		2	60	2
Enginery	9		2	10	1
Thermodynamics	15	3		5	1
Internal Comb. Motors..	16		2	5	1
Steam Turbine	17		2	5	1
Hydraulic Motors	18	2		7	1

MINING ENGINEERING.

No one can doubt the need for training in the principles of mining engineering in a country where there is so much hidden mineral wealth as in our own state. We also stand at the very portals of that great storehouse of mineral wealth—Alaska.

There are also great possibilities along the lines of development indicated by economic geology. The location and

opening of quarries of building stone; the manufacture of Portland cement; the making of various kinds of brick, call for a knowledge based upon the principles taught in this department. The student is also taught the principles of scientific prospecting, mine surveying and assaying.

Following is the exhibit of work now in progress:

<i>Subject</i>	<i>Course No.</i>	<i>Credits</i>		<i>Stu- dents</i>	<i>Sec- tions</i>
		<i>1st Sem.</i>	<i>2d Sem.</i>		
Mineralogy	1 & 2	4	4	21	2
Geology	3	3	4	46	2
Excavating & Tunneling	7	2		2	1
Metallurgy of Iron and Steel	14	3		7	1
Mine Surveying	8	2		14	1
Seminar	16	1	1	18	1
Fire Assaying	12		4	20	1
Mining	9		3	12	1
Mining Law	11		1	12	1
General Metallurgy	13		4	15	1
Metallurgy of Copper....	15		4	10	1

MECHANIC ARTS.

The courses in Mechanic Arts were planned to help those who desire to enter the skilled trades as craftsmen. The decay of the apprenticeship system has made it extremely difficult for young men to gain a working knowledge that will enable them to enter their chosen line of work. The demand for an education of this kind has been recognized in the older and better developed industrial centers of our country for years, and various methods have been tried to satisfy the demand. The latest movement seems to be the building of great technical high schools where students can learn the underlying principles of a trade and at the same time receive the fundamentals of a sound education. Mr. George H. Martin, secretary of the Massachusetts State Board of Education, in defining the place and function of such a school in our educational system, says: "The work of the school will be three-fold: (a) To furnish technical knowledge and technical skill; (b) to promote intelligence,

breadth and refinement of a cultural sort; (c) to develop a sense of civic obligation."

The course in Mechanic Arts has for its purpose the training of mechanics rather than engineers. We are confident that there are many young men who cannot afford to take a four-year course in engineering, but who desire to enter industrial work as skilled artisans. We believe that such persons would be greatly benefited by a two-year course in this department, where they receive careful instruction in handicraft and at the same time broaden their general education by taking work in English, mathematics and general science.

In our state this matter has received scant attention, although the time is now ripe for the development of this branch of our education, if we would give the people what they desire. It seems eminently fitting that the State Agricultural College should pioneer the way in this matter since a large part of the present equipment and teaching force are readily adapted to the work. A beginning was made this year when a two-year course was offered with the leading industrial courses in woodwork including carpentry, cabinet making and pattern making; and in iron work, blacksmithing, plumbing and pipe fitting. The result seems to justify the action since there are now 53 students taking the first year of this work. The principal is a broad one and if it succeeds, several other courses will be required in addition to those now offered.

The crying need of all departments is larger equipment and more teaching force. Just how far these requirements can be met in the near future is a matter of grave concern to us at this time. We fully realize that many other departments of the College are in similar circumstances, and further that a sum of money sufficient to meet all of the requirements would be so large that even a friendly legislature and a liberal minded public would find it very difficult to grant the appropriation. In view of these facts, our esti-

mates for the next two years are based upon actual necessities rather than the needs of the departments.

ADDITIONAL REQUIREMENTS.

During registration this year some inquiry was made for work in Architectural drawing and design. The school at present has nothing to offer along this line, and very likely it is not expedient to consider the establishment of such a course at present. However, as the country develops there will no doubt be a field of work in Architecture and structural engineering which will demand recognition.

ENGINEERING LABORATORY.

In planning the future work in engineering, there is evidently one feature that should be developed before all others. I refer to the engineering laboratory and the facilities which it affords for research work and commercial testing. Its usefulness would not be limited to mechanical engineering alone but would include the whole school of engineering with the possible exception of electrical engineering which has its own special laboratory. The main features to be provided for are: (a) The testing of the strength and fitness of the materials used in engineering and building construction; (b) tests of the heat values of the natural and artificial fuels; (c) tests of the useful qualities of lubricating oils and anti-friction bearings; (d) tests to determine the efficiency and economical working of steam engines and boilers, steam turbines, gas engines, water wheels and other prime movers. In fact, the engineering laboratory should afford facilities for the student to come into contact with actual engineering problems and to work out the solutions in a concise and businesslike manner.

What has been said of the general engineering laboratory is true of the electrical laboratory, so far as the inadequacy of the present equipment is concerned. It is only

with the greatest difficulty that students can be given work in these two laboratories on account of lack of facilities.

The engineering laboratory should be provided with a large testing machine of 200,000 pounds capacity, for testing beams of full size, but on account of the expense of installing such a machine it is omitted from our estimates at this time. The Mining department should have a complete ore testing plant, equipped with modern machinery sufficient to determine the most efficient method of milling any individual ore. The Civil Engineering department needs more instruments and more assistants to take care of the rapidly increasing number of students who are choosing this branch of engineering work.

SHOPS.

The College shops have been greatly improved during the last year by better quarters afforded by the new Mechanic Arts building and by additional equipment purchased for the wood shop and blacksmith shop. A power hammer is needed in the blacksmith shop and more lathes and hand tools in the wood shop before these shops are equipped as planned last year. The Machine Shop is greatly in need of lathes and other tools. It is now the most meagerly equipped of the three shops. A foundry is now the most important part of the shop department for which provision has not been made. It correlates the work of the wood shop and machine shop. In fact no college shops are complete without a foundry where students can study moulding and casting. The addition of a foundry under the direct supervision of a practical and capable man would be of great benefit, not only in supplying the demand for this kind of instruction but it would also enable the shop department to procure castings for machines and apparatus to be added to the equipment. With each shop under the supervision of an expert practical foreman, there is no reason why a great deal of apparatus for the shops and engineering laboratories should not be designed and built in the shops.

A wheelwright shop is another important adjunct to our shop department which should be added as soon as money is available for that purpose. The equipment is not very expensive, besides, a part of the old blacksmith shop equipment might be utilized. This shop and foundry might be housed in one building similar in design and construction to the other shop buildings.

TEACHING REQUIREMENTS.

The higher requirement for entrance to the regular degree courses, established last year and taking effect next September, has greatly strengthened these courses by placing many strictly engineering studies in the senior year where they will be required for graduation for the B. S. degree. Heretofore only those who took a post-graduate course could obtain much of this important professional work.

The effect has also been to greatly add to the instruction work of the heads of departments, as a careful study of the exhibits given elsewhere will show. At the same time the rapidly increasing size of the freshman, sophomore and junior classes, makes it imperative that more instructors be employed for field work, drawing, laboratory work and shop work. The need of additional help is felt in every department.

I believe that our instructors should be encouraged to attend summer school in some of the larger institutions and also to enter some of the large manufacturing concerns, if possible, to get in closer touch with the best methods of doing the work required of them.

The several engineering societies should be encouraged and a larger number of students should participate in the work.

It would be very desirable to have a reading room where technical journals might be accessible to students nearer to their work than the general library. Owing to the fact that no room seems to be available for this purpose, I am unable

to make definite recommendations at this time. Our general library should be greatly strengthened by the addition of standard authoratative works on various engineering and technical subjects. No one thing would be of greater value than to have the published proceedings of the leading engineering societies of the country regularly coming to our library. I would recommend that they be included in the list of periodicals provided for each year.

Respectfully submitted,

G. A. COVELL,

Dean.

REPORT OF THE DEAN OF THE SCHOOL OF COMMERCE.

To the President of the College,

Sir: The School of Commerce is one of the younger departments of the institution and its history is, therefore, brief. Courses in "Shop Accounts" have been offered as far back as 1890 in obedience to the requirements of the Morrill Act, but it was not until 1898 that the course known as the Literary Commerce course was organized. The attendance in this course for the last two years reported by Professor Crawford, was as follows: In 1906-7, Accounting, 53; Stenography and Typewriting, 33; in 1907-8, Accounting, 58; Stenography and Typewriting, 55.

With the expansion of the institution in every direction and in response to the growing demand for leaders in commercial enterprises, the Regents established the School of Commerce in the spring of 1908. As organized at present, the School embraces four distinct departments, viz.: Business Administration, including Accounting and Auditing; Political Economy, including Banking and Finance; Political Science, including Commercial Law; and Stenography and Typewriting. Seven different courses are offered in Busi-

ness Administration, eleven in Political Economy, four in Political Science, and five in Stenography. Additional courses will be offered as teaching force and equipment permit.

The School of Commerce is taking a leading part among schools in emphasizing the business side of the farm, the shop, and the household. While the School of Commerce places special emphasis on work preparatory to commercial pursuits, the fact that there is a business side to every vocation has been recognized by providing in the second year of all elementary courses, a two-hour course in Business Methods, especially adapted for the farmer, mechanic, housekeeper, and the professional man.

In spite of serious difficulties, the work of the present year has been very encouraging thus far. The attendance is as follows: Elementary, 27; Freshmen, 29; Sophomores, 32; Juniors, 16; Seniors, 18; Pharmacy students, 34; Domestic Science students, 56; total, 212.

By subjects the attendance is as follows: Elementary Bookkeeping, 53; Advanced Accounting and Business Practice, 25; Banking and Business Management, 12; Economics, 41; Banking and Finance, 20; Commercial Law, 20; Civil Government, 25; Stenography, 40; Typewriting, 55; Pharmacy Accounting, 34; Household Business Management, 56; Business Organization (Post Graduate), 2; total 393.

The School of Commerce will have its temporary home on the third floor of the new Agronomy building. Six beautiful rooms have been set aside for its use. The west room devoted to Business Practice and Administration is already provided with up-to-date equipment for office practice. It has a seating capacity for 118 students. The rooms devoted to stenography and typewriting are also fairly well equipped, though it has been found necessary to rent typewriters for the present year. I recommend that twenty late model machines be purchased as soon as practicable.

Owing to the fact that the industrial business courses are not offered until next year and that the present teaching

force is already inadequate, it will be necessary next year to add another assistant. There will be at least 200 second-year students in Agriculture, Engineering, and Mechanic Arts who will take up industrial accounting next year, and this will require the full time of an additional instructor.

An effort will be made to create an industrial museum in the department and a small appropriation will be required for this purpose. A great deal of valuable illustrative material can be secured from manufacturers and dealers free of cost, but transportation must usually be born by the institution.

In conclusion I desire to thank you for the support and encouragement the School of Commerce has enjoyed at your hands in common with other departments of the institution.

Respectfully submitted,

J. A. BEXELL,

Dean of the School of Commerce.

REPORT OF THE DEPARTMENT OF FORESTRY.

To the President of the College,

Sir: One of the chief sources of wealth in Oregon is the forests. The annual revenue from this source approximates \$30,000,000, and it is conservatively estimated that the present cut is considerably below the annual increment of growth. Today our state is the richest state in the Union in standing timber, having at least one sixth of the total amount in the United States. Mr. Pinchot estimates that this crop will be cut in thirty-five years at the present rate of lumbering, though it may be said to our credit that the present output from Oregon is much below the average annual cut for the Nation. In view of this condition it would appear that the standing timber of the state in a few years will be valued in terms of billions of dollars, for we are assured by the history of all older nations that the price

of timber steadily rises after the available supply begins to be measured in terms of years. What a marvellous source of wealth! What a fertile field for labor! How significant the wage income implied by such a gigantic resource! It bespeaks happy industrious homes, a rich commerce, a prosperous, contented, developed people—a great state! What is more important than that we wisely husband such a resource?

Official government reports indicate that the waste resulting from the harvesting of the enormous tree crop of this region varies from 25 per cent to 40 per cent, three-fifths of which could be saved if improved methods of utilization were employed, thereby contributing another \$5,000,000 at least to our yearly income. Another source of waste is the increasingly large areas of diseased timber, the percentage of loss from this source often reaching 15 per cent to 20 per cent of the crop, or another \$5,000,000. The loss from fire, though not heavy in recent years, has been altogether almost beyond estimate. A very conservative estimate would probably put the annual loss, including injury to the soil and young growth, at \$100,000 to \$250,000. Oregon timbermen assert that for every thousand feet of lumber put upon the market our people receive direct as wages about eight dollars. Every thousand feet of lumber destroyed by fire therefore is a direct loss to the public.

Does it not appear from these considerations that it behooves the State to take measures to protect, develop, and make permanent this great source of wealth? The Nation appropriates nearly \$200,000 yearly for this purpose, *i. e.* for the administration of the National Forests within the state, the income from which will practically accrue to the citizens of Oregon at harvest time. If the subject is worthy of such care on the part of the Nation it certainly must be of more than passing importance to the State itself.

That the State has some imperative duties with reference to this subject seems apparent. There is a great industry, with an annual income of \$30,000,000 or more, to foster;

an enormous annual loss from waste, disease, fire and pests, of \$10,000,000 or over, to prevent; a strong public sentiment looking to forest conservation, fire protection, sane taxation and reforestation, to be developed; and a sound economic State forest policy is also necessary. To accomplish these ends implies much work of a special, scientific and technical character. It will require the services of men especially trained to conduct the investigations, to promote the publicity, and to extend the education necessary to bring about the accomplishment of such comprehensive results.

To meet such a demand this College has provided a regular degree course of four years, which is to be supplemented with winter and summer short courses. While the leading course aims to provide students with a technical training, it does not lose sight of the fact that a College graduate and a forester should have a well-rounded education equipping him for efficient citizenship as well as for a special occupation. To this end the course of study covers a field of work somewhat more liberal than a purely technical course. At the same time the short courses, and particularly the summer course, which is altogether field practice in general forestry, rounds out the student's training in the technical branches of the subject. Besides offering the student opportunities to secure a liberal and technical education in the general subject of forestry, it also affords him, through its various departmental laboratories a wide range of privileges in the pursuit of special information upon particular topics, such as construction work, timber technology, forest engineering, forest regeneration, tree-growth and tree-culture, the chemistry of forest products, utilization of forest waste, animal husbandry, forest protection, tree and timber diseases and pests, timber preservation, destructive distillation, and such other technical topics as appeal to the tastes of the individual student, the purpose being to educate and train a force of men competent to develop the forest interests of the state in their every phase, whether of public or private ownership. The graduate from such a

course is competent to enter upon the great work of helping to solve the problems of forest protection, conservation, utilization, and development, which, at no distant day, will be demanded by the people of the state.

To meet the requirements for the special technical instruction demanded for such training it is imperative that provision be made for floor space aggregating some four thousand square feet; apparatus and equipment, costing approximately \$3,600; \$2,400 for assistance for the biennium; and land for a forest nursery which will cost \$4,000. This last item is one of particular importance. A tract of timbered land suitable for demonstration work in surveying, mensuration, cruising, logging, reforestation, nursery-work, and the great variety of out-door practicums attendant upon such a course of study is a prerequisite. A forest course given without access to a forest and nursery would be like a course in chemistry without access to a laboratory, for the forest is, in fact, the chief laboratory of the forest course.

In order to place this department upon an efficient working basis at a minimum cost a plan of co-operation with the department of Mechanical Engineering has been arranged whereby several pieces of expensive apparatus will be used in common. This plan will result in a considerable reduction in the cost of the original installment of a suitable equipment for this department, and though involving the students in extra labor it is thought that under the circumstances the joint use of some \$5,000 worth of apparatus is practical economy at this time.

Permit me in closing this brief report to call your attention to a measure now before Congress which has for its purpose the endowment of schools and colleges teaching and conducting research work in forestry. As an indication of the attitude of the public towards this line of education and research, it may be said that every state in the Union has endorsed the measure officially or otherwise. This measure expressly provides \$5,000 annually for teaching the subject,

and an equal amount for research on condition that each state accepting the grant provides an equal amount for the same purpose.

Respectfully submitted,

E. R. LAKE,

Professor of Forestry.

REPORT OF THE DEPARTMENT OF PHARMACY.

To the President of the College,

Sir: With the enactment of the law to regulate the manufacture and sale of medicine within the state, professional pharmacy of Oregon was placed upon a higher plane. By provision of this law a Board of Pharmacy was authorized whose duty it is to pass upon the qualifications of all persons desiring to practice pharmacy in this state. Eligibility of candidates is determined by means of rigid examinations held by this Board.

At the time of the enactment of this law, no course of instruction was offered in pharmacy by any institution in the state. It soon became apparent, however, that, with the elevation of professional standards, came the necessity of meeting in an educational way the new condition of affairs.

Appreciating the needs of the situation and realizing that such instruction could very economically be given at this institution, the Regents of the College, after advising with and receiving the approval of the U. S. Commissioner of Education, decided to include such a course in the curriculum of the College. The success of the department during the ten years of its activity attests the wisdom of that decision. It is no longer necessary for the young men and women of Oregon to leave the state in order to receive pharmaceutical instruction. Graduates of this department occupy prominent positions of trust and responsibility, not

only in Oregon and adjoining states, but also in the East and in our Insular possessions.

The character of the work done by the department, from a practical viewpoint, is evidenced by the approval and support of the State Board of Pharmacy.

With respect to the assumption that the course can be maintained with exceptional economy at this institution, explanation may be offered that, since laboratories and instructional force are maintained in the subjects of chemistry, in physics, in botany, in biology, and in bacteriology for use of students in the courses of agriculture, engineering, and domestic science, and since these subjects form the scientific base upon which the profession of pharmacy rests, it follows that students in this department, by association with those of other departments, may receive instruction in these subjects at a very slight additional expense to the College.

The character of the instruction given by the department is such as to fit its graduates not only for the most exacting service in pharmacy, but also to qualify them for positions as chemists and as instructors in various scientific subjects. It not infrequently happens that graduates in pharmacy enter medical colleges, the training as pharmacists enabling them to take up the study of medicine under the most favorable conditions.

A resume and comparison of the work of the department during the past two years and an observation and estimate of the same for the current year, may be of interest. With respect to the number of students enrolled in the department during the time mentioned, the following tabulation will afford information and opportunity for comparison:

	1906-7.	1907-8.	1908-9.
Total students enrolled	78	80	91
Reporting for advanced, or professional features of the work	45	56	66

For the years 1906-7 and 1907-8 the three terms system of instruction obtained. Under conditions then existing, the work was arranged in such manner that it was handled

by one instructor. The average amount of instruction per week was 24 credits, and the size of the sections, or classes, was for the first year sixteen and for the second, nineteen. For the current year, under the semester system, the work for the first semester is so adjusted that one instructor is doing practically all the teaching. The credits per week are, on average, twenty; and the students per section, twenty-seven. The character of the work as outlined for the second semester is such as to require an increase in the number of sections and a corresponding decrease in the number of students per section. The instructor will then require the services of an assistant to a greater extent than has before been found necessary.

It is estimated that the work during the biennial term, July 1, 1909, to June 30, 1911, will average with respect to the pharmaceutical subjects, thirty-two classes or sections to be instructed per week. As a considerable portion of this work will consist of laboratory practice, the average number of periods actually involved will exceed forty. The number of students per section should not greatly exceed fifteen, if it is expected that the student receive proper exhibition of the subject taught. The services of two instructors would insure the work being given in this manner.

The present quarters of the department, Alpha Hall, assuming exclusive use of entire building, will suffice for present needs. Certain repairs and alterations are needed to place the building in fit condition for its use to house the department. The attempt to heat the building by means of stoves has proven the inadequacy of such a system. It may be timely to call attention to the fact that the use of stoves in the various rooms, lacking as we do all means of fighting fire, places the building in jeopardy of loss by that element. The need of a steam heating system for the building is so urgent as to call for the statement that without it the building, in winter weather, cannot be used.

Respectfully submitted,

C. M. MCKELLIPS,
Professor of Pharmacy.

REPORT OF THE LIBRARIAN.

To the President of the College,

Sir: Based upon the outline sent from your office on October 12, 1908, the following report of the present condition of the Oregon Agricultural College library and its needs for the next biennium is respectfully submitted:

Books in Library.

General and reference books (bound volumes)	7,180
Government documents	5,000
Pamphlets (estimated)	10,000

Library Rooms.

The general reading room is 60 feet by 40 feet and has a seating capacity at the tables of 108 readers. Reference books and current periodicals are kept in this room for the service of all students. The general stack room contains the general, or classed, books of the library and the bound periodicals, and is equipped with two tables and twelve chairs. Here special reference work is done by the faculty, graduate students, and seniors.

In the document stack room are kept the government documents and the unbound periodicals which the library keeps on file.

There is also an office for the librarian, and a small store room.

Organization of the Library.

On the second day of July, 1908, the present librarian began the work of organizing the library. A trained cataloger, Miss Edna Hawley, cataloger for the Oregon State Library, was secured for three months, and a student assistant was also employed for the greater part of this time. The library, including books kept in the departments for reference use, was classified and cataloged. A dictionary card catalog and a classified shelf list were made. The Dewey decimal classification system, which is in general

use in the libraries of the United States, was used. The books were marked and arranged on the shelves by classes, so that they are now easily accessible.

The Oregon Agricultural College library is a government depository library and receives all the government documents which are sent to libraries. During the summer these were arranged by congress and session. The serial numbers given by the government were assigned in their proper order; and, through the kindness of the Engineering department, were marked on the back of each volume so that now the material contained in the government documents may be easily found by use of the government document indexes.

During the time that this work of organizing the library was going forward the library was moved from its old quarters in the basement of the Administration building to the second floor in the rooms described above.

REQUIREMENTS FOR THE NEXT BIENNium.

Room.

The reading and general stack rooms can probably be made to do for the next two years, though the reading room is altogether too small for a school of this size. An additional stack room will have to be provided for government documents and the periodicals which are kept on file.

Equipment.

Six stacks at \$40 each.....	\$ 240.00
10,000 Blank catalog cards.....	29.50
10,000 Library of Congress printed catalog cards....	100.00
Library of Congress printed cards for government sets and technical and scientific society transac- tions	100.00
Periodical record guide cards.....	5.00
Catalog case (60 tray).....	130.00
Shelving for reading room to meet growth of ref- erence collection	100.00
Periodical racks	75.00
Small cases and desk trays	4.00
100 Pamphlet cases	11.00
200 Book supports	15.00

100 Shelf label holders.....	7.50
Periodical temporary binders	75.00
100 Pamphlet covers	11.00
Postal scales (National)	5.40
Miscellaneous	100.00

\$1,008.40

Supplies.

Postage	\$ 100.00
Miscellaneous supplies (including inks, book varnish, pencils, erasers, clips, typewriter ribbons, etc.)	100.00
Printing	50.00
Book repair material	20.00

\$ 270.00

Books. (Exclusive of department estimates included in department reports.)

Reference books: The reference books most needed are the New International encyclopedia, a one volume unabridged dictionary, the Scranton International Correspondence School text-books on technical subjects, technical dictionaries and encyclopedias, and indexes to technical literature. The reference collection for English work is very limited and needs large additions.....\$1,000.00

Current periodicals

800.00

Binding of periodicals and bulletins..... 1,000.00

General collection for reading room: This collection should be a very carefully selected collection for general culture, kept in the reading room where students in the technical courses will be tempted to use it. The best of our technical schools are becoming aware that we are sending out men who know machines, but who do not know men,—life. The student of the technical school takes these extended courses not alone that he may become a skilled mechanic—he learns machines that he may know how to manage the men who run machines. I believe that our school will be successful in sending out really great engineers and agriculturists in the degree that this is realized. For such a collection we will require.....\$ 500.00

Back numbers of valuable sets of technical journals, periodicals, and society transactions.....	500.00
General binding	100.00
Sociology, government, etc.	200.00
History and biography	400.00
Useful Arts	200.00
Science	200.00
Travel and geography	200.00
Art	100.00
	<hr/>
	\$5,200.00

In all the above items of equipment, supplies, and books, each group has been arranged according to desirability, though every item seems to me a necessity if the library is to catch up with the rest of the school, not to mention keeping pace with it. However, if there must be a reduction of the estimate, I would recommend cutting out entirely the least necessary items and doing well what we attempt to do. From what I have seen, I judge that at least \$4,000 will be estimated to meet the needs of the departments for the coming two years. Such an estimate I should consider conservative. If it should be necessary to lower the estimate I think it should not be for either reference books, binding of periodicals and bulletins, or current periodicals. We must have better reference tools.

Assistance.

At present the assistance in the library is a student working three recitation hours a day during the school week and all day on Saturday. This help is entirely inadequate to meet the needs of the library. A full time assistant is recommended, one who has had either regular library school training or summer school training. She should be able to do the technical work of the library. Such an assistant could probably be secured for \$75 per month		\$1,800.00
Student help as at present.....		300.00
		<hr/>
		\$2,100.00

Library Expansion Suggested.

As soon as a full time assistant may be had, the library should be open evenings for the sake of both the students and faculty. There should be given regular class instruction to freshmen once a week in the use of the library,—how to use catalogs, indexes, and general reference books, with practical problems fixing instruction given. There should also be given by the librarian during the year, a series of eight or ten talks on reading to inspire an interest in good books and to cultivate the habit of good reading. These talks should be obligatory for freshmen and elective for students above the freshman year. This course is especially necessary in a technical school, where, of necessity, general culture gets too scant attention. To overcome this disadvantage of a technical school, University of Illinois has required of her engineers for the past two years a regular summer (vacation) course in general reading for culture. This is also in line with the Princeton preceptorial method which is creating so much interest in the educational world.

There is a great deal of work which should be done for our library in securing reports, bulletins and circulars, especially for the agricultural department. Our files of government and state reports and bulletins have not been carefully preserved and it is imperative that as soon as possible these files should be filled where it may still be done. To this end, as soon as sufficient help can be supplied, the experiment station exchange mailing list should be turned over to the library, for it is through careful attention here that the library file of bulletins, reports and other valuable publications are kept filled to date. The United States Department of Agriculture publishes card catalogs of its publications which have been sent to this library. These cards have not all been preserved. One catalog has never been filed for use, and the other has not been filed since 1901.

The Oregon Agricultural College in its extension work should not neglect home reading and culture among the

farmers of Oregon. This work naturally falls to the library; and, with a good assistant, would be practicable. The work should be planned in conjunction with the Oregon Library Commission which is doing work along this line, so that there would be no duplication of effort. It would probably require occasional talks at farmers' institutes on home reading and home libraries; also preparation of selected book lists and bulletins. Short, helpful talks on reading in the home should be given during our short courses.

Your request for recommendations leads me to present the above.

Respectfully submitted,

IDA A. KIDDER,

Librarian.

REPORT OF THE REGISTRAR.

To the President of the College,

Sir: In compliance with your request of October 12th, I submit herewith statements of the enrollment, the classification by years and courses of study, and the geographical distribution of students for the years 1906-1907 and 1907-1908.

STUDENTS CLASSIFIED BY COURSES OF STUDY, 1906-1907.

Mechanics:

Seniors	2
Juniors	6
Sophomores	41
Freshmen	76

Electrical Engineering:

Seniors	19
Juniors	15— 159

Household Science:

Seniors	9	
Juniors	7	
Sophomores	13	
Freshmen	52—	81

Agriculture:

Seniors	13	
Juniors	2	
Sophomores	18	
Freshmen	47—	80

Pharmacy:

Seniors	10	
Juniors	4	
Sophomores	16	
Freshmen	48—	78

Special in Chemistry:

Seniors	1—	1
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Literary Commerce:

Seniors	8	
Juniors	5	
Sophomores	21	
Freshmen	63—	97

Mining:

Seniors	4	
Juniors	7	
Sophomores	10	
Freshmen	20—	41

Civil Engineering:

Sophomores	15	
Freshmen	18—	33

Forestry:

Sophomores	2	
Freshmen	3—	5

Graduates	14
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Special Students	24
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Sub-Freshmen	132
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Dairying and Agriculture	56
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Music	147
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Grand total	948
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Counted Twice:	
Music	115
Number of Students	<u>833</u>
Whole number of men.....	615
Whole number of women.....	218
	<u>833</u>

STUDENTS CLASSIFIED BY YEARS, 1906-1907.

Graduates	14
Seniors:	
Agriculture	13
Household Science	9
Electrical Engineering	19
Mechanical Engineering	2
Mining Engineering	4
Pharmacy	10
Literary Commerce	8
Special in Chemistry	1— 66
Juniors:	
Agriculture	2
Household Science	7
Electrical Engineering	15
Mechanical Engineering	6
Mining Engineering	7
Pharmacy	4
Literary Commerce	5— 46
Sophomores:	
Agriculture	18
Forestry	2
Household Science	13
Civil Engineering	15
Mechanical Engineering	41
Mining Engineering	10
Pharmacy	16
Literary Commerce	21— 136
Freshmen:	
Agriculture	47
Forestry	3
Civil Engineering	18

Mechanical Engineering	76	
Mining Engineering	20	
Pharmacy	48	
Literary Commerce	63	
Household Science	52—	327
Sub-Freshmen		132
Special		24
Special Agriculture and Dairying.....		56
Music		32
Total		<hr/> 833

STUDENTS CLASSIFIED BY COURSES OF STUDY, 1907-1908.

Agriculture:

Graduates	3	
Seniors	8	
Juniors	8	
Sophomores	24	
Freshmen	60	
Dairying—Winter Course	28	
Summer Course in Agriculture	63	
General Agriculture—Winter Course.....	30	
Horticulture—Winter Course	12	
Special	6—	242

Forestry:

Sophomores	5	
Freshmen	5—	10

Household Science:

Graduates	2	
Seniors	12	
Juniors	9	
Sophomores	27	
Freshmen	60	
Household Science—Winter Course.....	29	
Special	16—	155

Civil Engineering:

Graduates	1	
Seniors	4	
Juniors	5	
Sophomores	19	
Freshmen	47—	76

Electrical Engineering:

Graduates	1	
Seniors	16	
Juniors	27	
Sophomores	30	
Freshmen	63—	137

Mechanical Engineering:

Graduates	1	
Seniors	9	
Juniors	4	
Sophomores	17	
Freshmen	57	
Mechanical Engineering—Winter Course	11—	99

Mining Engineering:

Graduates	2	
Seniors	6	
Juniors	3	
Sophomores	20	
Freshmen	18	
Special	1—	50

Literary Commerce:

Seniors	14	
Juniors	11	
Sophomores	21	
Freshmen	54	
Special	5—	105

Pharmacy:

Graduates	1	
Seniors	11	
Juniors	4	
Sophomores	14	
Freshmen	49	
Special	1—	80
Sub-Freshmen		141
Graduates, Special		4
Specials		38
Music		20

Total	1157
Counted twice	1

Total number of students	1156
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Total number of men.....	820
Total number of women	336
Total	1156

STUDENTS CLASSIFIED BY YEARS, 1907-1908.

Graduates 15

Seniors:

Agriculture	8	
Household Science	12	
Civil Engineering	4	
Electrical Engineering	16	
Mechanical Engineering	9	
Mining Engineering	6	
Pharmacy	11	
Literary Commerce	14—	80

Juniors:

Agriculture	8	
Household Science	9	
Civil Engineering	5	
Electrical Engineering	27	
Mechanical Engineering	4	
Mining Engineering	3	
Pharmacy	4	
Literary Commerce	11—	71

Sophomores:

Agriculture	24	
Forestry	5	
Civil Engineering	19	
Household Science	27	
Electrical Engineering	30	
Mechanical Engineering	17	
Mining Engineering	20	
Pharmacy	14	
Literary Commerce	21—	177

Freshmen:

Agriculture	60	
Forestry	5	
Civil Engineering	47	
Electrical Engineering	63	
Mechanical Engineering	57	

Mining Engineering	18	
Household Science	60	
Pharmacy	49	
Literary Commerce	54	413
Sub-Freshmen		141
Specials		67
Music only		20
Winter Courses		110
Summer Course in Agriculture		63
Grand total		1157
Counted twice		1
Total		1156

STUDENTS CLASSIFIED BY COUNTIES, STATES AND FOREIGN COUNTRIES.

1906-7.		1907-8.		1906-7.		1907-8.	
Baker	20	20		Lincoln	7	11	
Benton	115	198		Linn	59	79	
Clackamas ..	39	47		Malheur	24	12	
Clatsop	12	23		Marion	43	60	
Columbia	16	14		Morrow	24	22	
Coos	14	13		Multnomah ..	89	127	
Crook	6	12		Polk	27	37	
Curry	0	3		Sherman	9	7	
Douglas	17	25		Tillamook	8	5	
Gilliam	6	11		Union	27	35	
Grant	3	9		Umatilla	23	26	
Harney	7	13		Wasco	34	41	
Jackson	6	11		Washington ..	35	56	
Josephine	6	4		Wheeler	3	2	
Klamath	9	15		Wallowa	8	17	
Lake	1	7		Yamhill	30	52	
Lane	20	28					

		1906-7.	1907-8.
Number of counties in Oregon....		33	33
Total number of counties represented		32	33
Total number of students from—		1906-7.	1907-8.
Oregon		747	1042
Arkansas		2	1
Alaska		2	3

California	9	16
Colorado	1	2
Idaho	4	10
Indiana	0	2
Illinois	2	0
Iowa	19	15
Kansas	1	1
Michigan	2	1
Missouri	2	2
Montana	1	1
Nebraska	9	7
Nevada	0	1
New Hampshire	1	0
New Jersey	1	1
North Dakota	0	1
Oklahoma	1	0
Pennsylvania	1	0
South Dakota	0	3
Texas	0	2
Utah	0	4
Washington	30	35
Wyoming	0	1
British Columbia	1	1
India	6	4
Total	833	1156

Respectfully submitted,

J. B. HORNER,
Registrar.

REPORT OF THE DIRECTOR OF THE EXPERIMENT STATION.

To the President of the College,

Sir: I have the honor to submit herewith the report of the Experiment Station for the year ending June 30, 1908, together with suggestions which are deemed of especial importance to the agricultural interests of the state.

The work of the various departments of the Experiment Station has made commendable progress during the past year. However, new problems and fresh difficulties are constantly confronting the Station workers. This is due largely to the transitory condition of our agriculture from extensive to more intensive systems of husbandry. Dairying, the largest single agricultural industry of the state, has in a measure during the past year been somewhat retarded in its development owing to the abnormal cost of concentrated feed. Thus this industry demands for its best interests that much work should be done in an attempt to evolve systems of crop growth that will enable the farmer to supply the requirements of his herd from his own farm. This work has received a goodly share of the attention of the Station in the way of producing special crops for the dairy. The Station has demonstrated beyond question that alfalfa can be successfully grown on practically all of the well-drained soil of Western Oregon. This of itself should add millions of dollars to the dairy interests of this section. It has also demonstrated that kale (*Brassica oleracea*) in an ordinary winter, is by far the most economical winter succulent feed that can be grown west of the Cascade range. Not only is this an excellent succulent feed for the dairy cow, but sheep and hogs can also be wintered cheaply on this feed.

Owing to the very high price of mill feed many substitutes have found their way into the channels of trade, and while this state has no control law regulating the sale of these substitutes feeds, the Station has at all times endeavored, so far as practicable, to safeguard the purchasers' interests by conducting experiments in feeding and analyzing these substitutes. In some cases they were found to be of little value and dairymen have been appraised of this fact. There is, however, a very large field of work presented by the dairy interests of this state.

Without doubt, fruit growing is the most rapidly developing branch of agriculture at the present time. Oregon

is destined to become one of the greatest fruit-growing states in the Union. Thus it becomes the duty of the Experiment Station to assist in every way possible those who are engaged in this great industry. Despite the fact that conditions are exceptionally favorable for fruit growing throughout the state, there are, however, a number of very serious problems confronting growers. Among the most serious are Pear Blight, Anthracnose, Apple and Pear Scab and Gummosis of the Cherry. While the Station has done much work of investigation, the problems presented by these pests are far from being satisfactorily solved. There should be a special representative of the Station located at Hood River. We do not recommend this because Hood River is more seriously troubled than other sections, which is not so, but in the interest of economy, because the fruit-growing industry of this valley is more highly developed and more concentrated than in any other section. Thus a representative of the Station at this point can accomplish more than he can at any other fruit district in the state.

DEPARTMENT OF ENTOMOLOGY.

As in the two preceding years, the work may be conveniently grouped under A, Adams Investigations, B, work under Hatch Act.

A. Adams Investigations.

Under the Adams Act three problems are being investigated by this department:

1. Lime-Sulphur Spray.
2. Apple Tree Anthracnose.
3. Cherry Gummosis.

In the Lime-Sulphur investigation we have materially increased our knowledge of the stock solution method of preparing such sprays, a method which is now attracting considerable attention in various parts of the country. We have also verified the results of the two previous years' work as to the value of such sprays in controlling San Jose

Scale and have accumulated further experimental evidence which serves to extend the range of usefulness of this spray as an insecticide. The most important part of the work, however, has been to demonstrate the value of spring applications of dilute lime-sulphur solutions in controlling apple scab and other fungous diseases.

In that portion of the investigation which deals with the nature of the lime-sulphur compounds, and which attempts to learn how and why such compounds destroy insects and fungi and injure foliage, comparatively little progress has been made. In this connection it is evident that before satisfactory progress can be made it is necessary first to thoroughly investigate the chemistry of lime-sulphur compounds.

Apple Tree Anthracnose.—Material progress has also been made in the Apple Tree Anthracnose investigation. The orchard survey which was undertaken to study the effect of soil conditions in their relation to this disease and also to note the relative susceptibility of different varieties of apple trees in its attacks, has been completed. The co-operative experiments in the orchard of Hart Brothers at Springfield were continued with satisfactory results, demonstrating in connection with the work of the preceding year that it is practicable to nearly exterminate the disease from badly infested orchards in two years by the fall spraying methods which have been previously recommended by this department. We have also determined by cultures and cross-inoculations that under such adverse climatic conditions as prevailed last spring the Anthracnose fungus may also attack pear, prune, peach and apricot trees.

Cherry Gummosis.—Considerable literature relating to the same or similar diseases in other countries has been consulted, a rather extensive bibliography of the subject has been prepared, and some field observations were made during the past summer.

B. Under Hatch Act.

The principal work done under the Hatch Act has been co-operative spraying experiments in controlling Peach Fruit Spot in the orchard of Mr. Joy at Ashland. This is a continuation of the work of last year and has given even better results. The two seasons' work has demonstrated that this most serious of the peach diseases of the state can be very readily controlled by spraying. Arrangements have been made to continue the work another season to determine the minimum number of applications that will prove effective.

Some observations were made upon the work of the Shot-hole Borer, *Xyleborus dispar*, and also upon an undetermined pear and apple disease which was very prevalent last spring.

DEPARTMENT OF HORTICULTURE.

Adams Act.—Horticulture 1.

Pollination of the Apple and Condition Affecting It.—Considerable progress has been made in the pollination work, on such phases as the blooming period, determination of sterile and fertile varieties, transportation of pollen, mutual affinities and receptive periods of blossoms.

Horticulture 2.—

Irrigation of Fruit in the Rogue River Valley.—Under irrigation, careful notes have been taken on the progress of irrigation in the action of one application or a combination of applications at various dates. It is yet too early to draw definite conclusions as to this year's work.

Horticulture and Entomology, Project I.

Gummosis of the Cherry.—On the gummosis work some observations have been made on soils and exposures and seven hundred young cherry trees are being set out this fall for experiments in grafting in its relation to this condition.

Hatch Act.—Co-operative Work.

A. With Fruit Growers.

Two orchards in the Willamette Valley to determine the best varieties, and feasibility of commercial orcharding in this valley, especially with young trees.

Cover crop work in various parts of the state.

B. With National Department of Agriculture.

Disease resistance of potatoes.

Determination of blooming periods and growth of fruit trees.

Experiments with citrange.

DEPARTMENT OF CHEMISTRY.

Adams Act.—Chemistry 1.

Soil Leaching Experiments.—This investigation was planned with the following ends in view:

First: To determine the composition of the natural drainage waters from the various types of Oregon soils, tested with and without crops.

Second: To study the immediate effect of fertilizer application upon these soils as shown in drainage waters, special attention being paid to the results of potash and lime applications.

Third: To determine the total mineral plant food, potassium, calcium and phosphorus in various soil types, with special attention to lime existing in the carbonate form. No such determinations have thus far been made on our soils.

Fourth: To determine the actual loss of plant food from the Willamette and Columbia river basins as obtained by monthly analyses of these river waters throughout the year. The results obtained in 3 and 4 above will give us valuable data for estimating the permanency of our soils.

Fifth: To determine the depth of penetrations of various fertilizers with definite amounts of rainfall, special attention being paid to the fixation of lime and potash in subsoils.

Sixth: To obtain a more exact theoretical knowledge of fertilizer action on the soil by detailed study of the properties and reactions of the various components of the soil, considered both singly and in mixtures.

Results of Investigations.—Previous work in this laboratory has shown that Western Oregon soils are almost universally rich in phosphates but only moderately well supplied with lime and potash; our work this year on the natural drainage from the College farm soil as a type has shown that phosphorus is lost in very small quantities, that potash is leached from the soil in quantities approximately four times that of the phosphates and that lime appears in these drainage waters in quantities from two to three times that of the potash. A study of various subsoils to the four-foot level has developed the interesting fact that much of this surface-leached lime has been fixed in the subsoil, the percentage of lime at the three-foot level often being double that of the surface nine inches. The fact that a deep rooting crop may have access to this lime is of great practical interest.

Chemistry 2.

Study of Digestibility of Steamed Corn and Vetch Silage.—This work has been completed and the results tabulated in bulletin form, which is now in press.

Chemistry 3.

Study of Lupulin and Other Active Principles of Hops.—Experiments with forced draft though promising have not yet developed an inexpensive and efficient method of drying. Low temperature drying has been demonstrated necessary for obtaining a high grade product. At a temperature of 120° lupulin has been found to soften, undergoing physical if not chemical changes with detriment to its quality. A sample of hops dried at a maximum temperature of 120° Farenheit, under the supervision of this department, was graded choice by an expert buyer. Chemical determinations of resin and oil content of various samples show that our

choice hops do not vary much from the same grade of Bavarian hops in this respect, the quality of the aroma, however, being of a different character. Experiments with some Bavarian varieties as noted in the yard of a prominent grower indicate that the Bavarian hop does not thrive well here.

Valuable work could be done in breeding varieties of good yield and with more delicate aroma than those now grown.

Hatch Act.—Co-operative with Department of Poultry Husbandry.

1. Chemical Studies in Incubation.

In co-operation with the Department of Poultry Husbandry a large series of determinations of carbon dioxide and moisture were made on both incubator air and the air beneath sitting hens.

Conclusion—

First: Carbon dioxide increases in both incubator and under hens as the incubation period progresses, being higher in each case just before hatching.

Second: Amount under hens averages somewhat higher than that in incubators.

Third: In view of the fact that great variation is noted with different hens under the same conditions and that applications of carbon dioxide in incubators does not improve hatching, it is concluded that carbon dioxide is not an important factor in determining the efficiency of incubation.

2. Composition of Milk from College Herd.

In co-operation with the Dairy Department during the past year the composition of samples of milk from the College herd was determined, testing both hand and machine milk. These determinations were made weekly throughout the year and give the first available data on the seasonal variation of milk in this state. This work is completed and results ready for publication.

3. Vetch Selection.

4. Composition of Spraying Material.

5. Sugar Beet Work, in co-operation with the Government Reclamation Service, Klamath County.

6. Peppermint Work.

During the year a shipment of peppermint roots has been received from the Michigan Station sent at the request of this Station for testing on our beaverdam soils. Through the co-operation of Mr. S. C. Inkley, a farmer of Washington County, they have been planted and will be tested for oil in due time.

7. Potash Determinations.

Co-operative work with the Association of Official Agricultural Chemists has been done on investigations of new methods for determining potash. Some valuable data have been obtained for publication.

DEPARTMENT OF DAIRY HUSBANDRY.

Work in Progress.

(a) Milking machine investigations.

(b) Problems relating to the variation in the fat content of hand separator cream. Results to be published at an early date.

(c) Testing dairy herds for individual farmers which is designed to give the Station information relative to fat production of individual cows in farmer's herds and the cost of same.

Work Contemplated.

(a) A study of intensive dairying with the Station herd.

(b) An investigation of the percentage of solids not fat in milk, both actual and with relation to the fat content.

(c) A study of the possibilities in the manufacture and sale of soft cheese, Camembert, etc., in the state, particularly where transportation is a serious problem.

DEPARTMENT OF POULTRY HUSBANDRY.

Adams Act.—Poultry I.

Incubation Problems.

This work has been well organized and good results are expected during the current year.

Hatch Act.

1. (a) A study of the relative efficiency of natural and artificial incubation.

(b) Improvement in incubation and brooding.

2. An investigation of hen-hatched and artificially hatched chickens. The results of this investigation have been published in bulletin 100 of this Station.

In addition to the incubation work an elaborate experiment in poultry breeding has been undertaken.

DEPARTMENT OF BACTERIOLOGY.

The major work during the past year has been an investigation of the cause of mortality in incubator chicks that has consumed the largest portion of time. The progress has been satisfactory and a bulletin is now ready for the press setting forth the results in detail.

Work Contemplated.

(a) Testing the transmission of the tubercle bacilli from human sputa to fowls and of the bovine type to fowls by feeding.

(b) To test the transmission of bovine tubercle bacilli to milk through the mammary glands of the cow by feeding experiments, with cultures of the organisms.

DEPARTMENT OF AGRONOMY.

Experimental Work Now in Progress.

A. 1. Experiments with long and short rotation systems for improvement of soil fertility.

2. Experimental testing of the adaptability and value of alfalfa for hay and pasture in Western Oregon.

At the beginning of this experiment some eight years since it was generally thought by the farmers in the western section of the state that alfalfa could not be successfully grown. The experiments conducted at this Station have completely disproven this supposition, for not only has the Station grown alfalfa successfully but there are at least one hundred farmers growing alfalfa successfully in the Willamette Valley at this time.

3. Testing the adaptability and value of kale as a winter succulent feed for dairy cattle, swine and sheep.

4. Co-operative experiment in testing a number of varieties of vetch with the Bureau of Plant Industry, U. S. Department of Agriculture.

5. Experiment in co-operation with the Chemical Department in breeding *Vicia sativa* for higher protein content.

6. Experiment in clover growing for improving the fertility of so-called "white-land."

7. Experiment in breeding wheats for increase in both quantity and quality of yield.

8. Testing the relative value of dry plowing with disc plow and moist plowing with moldboard plow. (Results this past season were slightly in favor of moist plowing.)

9. Experiment in breeding corn to suit the environment of Western Oregon.

10. Experiment in co-operation with the Division of Farm Management, U. S. Department of Agriculture, in testing the value of cultivation compared with no cultivation without weeds.

11. Experiment in testing the value of irrigation (in the Willamette Valley) of vetch, clover, alfalfa, corn and potatoes in co-operation with the U. S. Department of Agriculture, Office of Experiment Stations.

DEPARTMENT OF ANIMAL HUSBANDRY.

The major work of this department for the past year consisted of soiling dairy cows; experimental feeding of

kale to cows, sheep and swine to determine its value as a winter succulent feed and the fattening of swine.

Digestion experiments were also conducted in co-operation with the Department of Chemistry with steamed corn and vetch silage and with kale, results of which have been tabulated for a bulletin which is now in press.

Two experiments to determine the value of kale as a winter feed for swine resulted as follows:

Lot 1 consisted of three aged hogs—weight at beginning 1265 lbs.; weight at conclusion, after 46 days of feeding, 1310 lbs.; gain, 35 lbs. Consumed, kale 1580 lbs., chopped wheat 135 lbs.

Lot 2, comprising 6 shoters, weighing 558 lbs., consumed in 46 days, kale 2125 lbs., chopped wheat 281 lbs., gained 102 lbs., thus making a gain of one pound live weight for each 20.83 lbs. kale and 2.75 lbs. chopped wheat consumed.

The second experiment consisted of 2 lots of 6 shoters each,—period of feeding 45 days. Lot 1 weighed at beginning 660 lbs., at conclusion 810 lbs., gained 150 lbs.; consumed 3600 lbs. kale, 270 lbs. chopped wheat, requiring for each one pound gained 24 lbs. kale and 1.8 lbs. chopped wheat.

Lot 2. Initial weight 376 lbs.—at conclusion, 565 lbs. Gained 189 lbs.—consumed 2135 lbs. kale, 1350 lbs. skim milk, 400 lbs. whey, consuming for each one pound gain 11.30 lbs. kale, 7.1 lbs. skim milk and 2.1 lbs. whey.

These experiments indicate that kale is a good maintenance feed for swine and that when it is fed with a small supplementary feed of grain or skim milk economical gains can be secured.

For the purpose of determining the relative value of chopped wheat and chopped barley as a fattening food for swine and also to determine the value of skim milk as a supplementary fattening food, 28 shoters were divided into 4 lots.

Lot 1 was fed chopped barley; lot 2 chopped barley and

skim milk; lot 3 chopped wheat, lot 4 chopped wheat and skim milk. Period of fattening 61 days.

Lot 1, initial weight 872 lbs., consumed 2476 lbs. barley, gain 568 lbs., grain consumed for one pound gain, 4.36 lbs.

Lot 2, initial weight 880 lbs., consumed 2265 lbs. barley and 1619 lbs. skim milk; gained 669 lbs. Food required for one pound gain, barley 3.39 lbs., skim milk 2.47 lbs.

Lot 3, initial weight 899 lbs., consumed 2476 lbs. wheat, gained 506 lbs. Food required for one pound gain 4.89 lbs.

Lot 4, initial weight 869 lbs., consumed 2264 lbs. wheat and 1619 lbs. skim milk; gained 756 lbs. Food required for one pound gain, 2.99 lbs. wheat, 2.14 lbs. skim milk.

In this experiment the chopped barley gave slightly better results than the chopped wheat. The supplementary skim milk, however, gave rather remarkable results, especially with Lot 3. Taking as a comparison the amount of ground barley required to secure one pound gain in Lot 1, 149.50 lbs. of the gain in Lot 2 should be accredited to the skim milk. This extra gain estimated at \$6.00 per cwt. would be worth \$8.97, or giving skim milk in this instance a value of 55 cents per cwt. In Lot 4 the skim milk should receive credit for a gain of 293 pounds, which would give the skim milk a value of \$1.08 per cwt.

There has been but little work done at this Station along the lines of fattening cattle and sheep. In order to satisfactorily meet the growing demand for information on these subjects it is suggested that the Station undertake feeding experiments with cattle and sheep on a sufficient scale to be of value both from the standpoint of experimental feeding as well as furnishing practical object lessons to the students in Animal Husbandry.

A feeding experiment with cattle, to be of real practical value, should be sufficiently large so that the individuality of any single animal will not materially affect the general result, hence I would suggest that an experiment with at least sixteen cattle be undertaken. These could be divided into four lots of different types, or they may be divided so

that different feeding stuffs can be used. This will be a useful investigation to stock feeders and at the same time will give our students in Animal Husbandry a good opportunity of gaining valuable experience in the desirability of certain types of stock and also the advantage of the different methods of feeding. Furthermore the animals could be marketed to a much better advantage in car-load lots.

Practically nothing has been attempted thus far in this state in the line of experimental feeding of sheep. This should be made an important industry on the farms of Oregon. Hence the Station should at the earliest opportunity conduct some feeding experiments with sheep.

MORE LAND REQUIRED.

The acreage of the present College farm is inadequate for the proper solution of the many problems confronting two of our most important agricultural industries, viz., dairying and horticulture. These two industries if liberally supported should in less than two decades reach a production representing a combined value of one hundred million dollars annually. This development, however, in no small measure will depend upon the ability of this Station to successfully solve the many problems relating to those industries.

There is no question but that the work of this Station has been very helpful in the development of the various agricultural interests of the state, especially along the lines of improvement in general agricultural practices. The growing of clover, vetch, alfalfa, rape and kale throughout the western portion of the state, we modestly claim, is almost entirely due to the effort of this Station. This change from the system of grain growing and the bare fallow has been worth millions of dollars to our farmers.

While good progress has been made in the production of forage crops, equally good results could be reached in the matter of their economical utilization if the Station possessed the land and means to take up the work of dairy

management. This would mean sufficient land and means to maintain a good practical dairy herd so that problems of feed production and the proper consumption of the same could be thoroughly investigated. It is evident that the dairy farmer can no longer depend upon mill feed. The output of this class of feed is entirely inadequate to the demand, thus the dairyman will be practically compelled to grow his own feed.

A dairy farm would enable the Station to take up work in soiling, crop rotation, the various problems of feeding cows, calves and swine. This work could be made of inestimable value to the dairy interests of Oregon.

Such a farm could also be utilized to demonstrate the correct principles of drainage and irrigation. There is scarcely a doubt but that a large portion of the Willamette Valley will ultimately be irrigated, thus the Station should secure all the data possible by means of a practical investigation. Drainage is also a very important problem. At least one-half of the Willamette Valley would be greatly benefited from drainage. These problems could be worked out in connection with the dairy farm. The farm also could be profitably utilized for plant breeding. There is an immense field presented for plant improvement. Varieties of corn could unquestionably be developed that would be of great value to the farmer. There is also an endless field for the improvement of the common cereals and the various forage plants.

In order to properly take up this work the College is in need of one hundred acres of additional land. This will cost approximately twenty thousand dollars. A convenient tract would be the land adjoining the College farm on the west, extending from the C. & E. Railroad on the south to the county road on the north. This land is not only conveniently located but it would also afford an excellent opportunity for experiments in irrigation. Oak Creek crosses the southwest corner of the land and there are at least fifty acres of the tract that could be irrigated.

Horticulture is another important industry and the land available for this work is entirely insufficient on the present College farm. The Experiment Station, under the Adams Act, operated under lease a local orchard for the past two years. This orchard consists of about four acres of Yellow Newtowns trees in bearing. The principal lines of work conducted were cultural methods, cover crops, cross pollination, thinning of fruit and spraying investigations. Much valuable data has been obtained and it is very important that this work be continued.

ROUTINE WORK.

There is a constant and bewildering increase in the various departments of the Station. The correspondence of the Station is rapidly increasing. During the year 10,000 letters were written in answer to correspondents. This constantly increasing correspondence and the clerical work of the Station necessitates a great deal of stenographic work, thus additional assistance should be provided.

The departments of Chemistry, Entomology, and Bacteriology are simply overwhelmed with routine work at times. This work seriously interferes with the progress of scientific investigations of problems coming strictly within the province of the Station. This routine work is important to the industrial interest of the state and means should be provided by the state for the necessary assistance to properly care for this important feature of the work.

The Chemical Department of this Station has in the past endeavored to analyze free of charge the various materials received from the citizens of the state. This work has been mainly confined to those products representative of important industries of the state or knowledge of which would be of general interest to the public at large. Examinations of feeding stuffs, sprays, fertilizers, waters and natural deposits such as phosphates, lime, gypsum, clays and sand, have in this way been made. The development of the dairy, horticultural and other industries of the state has

caused this routine work to assume large proportions and additional means must be furnished if it is handled properly. The chemical control of sprays, fertilizers, and feeding stuffs offered for sale within this state is a matter of no small import and has proven of extreme importance to other states. A fund appropriated by the state could be utilized to good advantage in furthering this work.

It is estimated that the proper control of the above work would require the services of a trained chemist throughout the year and an annual expenditure of two thousand dollars, divided as follows:

Salary of Chemist	\$1,500
Chemical Supplies	500
	<hr/>
	\$2,000

EASTERN OREGON EXPERIMENT STATION.

This Station is making good progress and has accomplished much work that is of scientific and practical value to the farmers in that section of the state. The principle lines of endeavor have been the production of high-grade sugar beet seed, plant breeding, mainly by selection and confined principally to forage plants and cereals. Much valuable work in horticulture has also been done during the past year, including an orchard survey of the Grande Ronde Valley, spraying demonstrations and the testing of small fruits. In addition to the work conducted at the Experiment Station farm, considerable co-operative work has been done which should prove of great value. This consists mainly of an investigation in connection with fruit growers of the cherry worm and methods for controlling the codlin moth and the growing of various forage plants. Also valuable co-operative work has been carried on in connection with the National Department of Agriculture in testing dry-land alfalfa. For this purpose the use of land conveniently located to the Station has been secured. These dry-land experiments with forage plants are conducted at Hot Lake

and Haymo Flat, the latter being at an elevation of 3,600 feet. Alfalfa representing practically all of the varieties known are under test at these places, also a large number of grasses are grown to test their value for range conditions.

In view of the fact that the eastern portion of our state is the great stock-producing region of Oregon, work along lines of experimental feeding of cattle, sheep and hogs should be undertaken. This section of the state presents a very large field for this class of work. Despite the fact of the immense numbers of live stock marketed from this section annually there is practically no data whatever as to the feasibility of finishing this stock in prime condition for the market.

DEMONSTRATION FARMS.

Among the many problems in agriculture the one of greatest magnitude and of the most immediate interest is found in the dry farming districts of the Columbia River Basin. In this section millions of bushels of wheat are produced, carrying away with it at least three million dollars worth of nitrogen annually. This tremendous drain upon the potentiality of the soil is continued from year to year without scarcely any attempt to restoration. The methods of husbandry followed in this section are not only exhausting the fertility of the soil, but the physical character of the soil is being changed in such a manner that will really jeopardize production sooner or later. There should be at least one or more demonstration farms established at the earliest opportunity in some typical section so that systems of husbandry if possible may be evolved to arrest this loss of fertility. These farms should be owned and controlled by the state. Not only may they be useful in solving problems of immediate interest but they will be needed for solving problems that will be constantly presented for an indefinite space of time. The value of such an experimental and demonstration farm to the agricultural interests of the dry farming sections of our state cannot be intelligently esti-

mated. It would certainly prove to be a potent factor in developing new and better systems of farming which would greatly add to the agricultural wealth of our state.

DEMONSTRATION FARM AT HERMISTON IN CO-OPERATION
WITH THE UNITED STATES RECLAMATION SERVICE.

Since large areas of arid land in this state are soon to be reclaimed by means of irrigation it is very important that experimental data be secured at the earliest practicable moment as to the duty of water, best method of application and character of fruit and other classes of vegetation best adapted to the location.

Hermiston presents a very favorable field for such investigation, being accessible and also representing a typical area of arid land.

It is proposed by the Secretary of the Interior that the general Government furnish the land, buildings, fences and bring the water to the farm, including the construction of the laterals without cost to the State, and also to provide for one-half of the expense of maintenance. Thus under such advantageous conditions much valuable data should be secured at very little cost to the state.

FARMERS' INSTITUTE AND OTHER EXTENSION WORK FROM
SEPTEMBER 11, 1907, TO JUNE 20, 1908, INCLUSIVE.

Thirty-nine Farmers' Institutes were held. Number of sessions 93. Total attendance 11,300. In co-operation with the Oregon Railway & Navigation Company a demonstration train was operated from May 11 to 15th inclusive in Sherman, Gilliam, Morrow and Umatilla counties. Eighteen stops were made. Total attendance 6,000. In addition to this, members of the Station Staff have made practical demonstrations at several fairs and have addressed a number of special dairy and horticultural meetings.

The following station publications have been issued during the year :

	<i>No. Issued.</i>	<i>Pages.</i>
Bulletin No. 94 The Apple from Orchard to Market	10,000	48
Bulletin No. 95 Disease of Turkeys.....	10,000	8
Bulletin No. 96 The Poultry Industry	10,000	40
Bulletin No. 97 Comments upon the State Fertilizer Law	8,000	11
Bulletin No. 98 Preserving Wild Mushrooms	10,000	6
Circular Bulletin No. 2	5,000	24
	<hr/>	<hr/>
	63,000	193

In addition to this a number of press bulletins have been sent out and considerable correspondence has been supplied to the agricultural and general press of the state.

ESTIMATED EXPENSES OF THE VARIOUS DEPARTMENTS OF
THE STATION FOR THE YEAR ENDING JUNE 30, 1909.

Department of Entomology.

Adams Act.

Salary of Assistant Chemist for Lime-Sulphur Investigations	\$1200	
Salary Assistant, Anthracnose Investigations	1200	
Salary Assistant, Cherry Gummosis Investigations	900	
Salary Field Assistant	900	
Salary Head of Department	300	
Supplies, labor, traveling expenses.....	350	4850
	<hr/>	

Hatch Act.

Salary Head of Department and Assistant....	800	
Incidentals, labor and traveling expenses.....	500	1300
	<hr/>	

Total \$ 6150

Department of Chemistry.

Adams Act.

Salaries of Chemist and Assistants.....	\$ 2700	
Apparatus and supplies	500	
Books	50	3250
	<hr/>	

Hatch Act.

Equipment:

Repairs	200	
Apparatus	1300	
Gas Machine	500	2000
		<hr/>

Supplies:

Chemicals	500	
Books	100	600
		<hr/>

Salaries:

Chemist and Assistants	700	
Routine (state)	1200	1900
		<hr/>

		\$ 4500
Adams		3250
		<hr/>
Total		\$ 7750

Department of Horticulture.

Adams Act.

Salaries		\$ 2540
Assistance, supplies and incidentals:		
Assistance	\$ 1280	
Supplies	175	
Incidentals and traveling expenses.....	425	1880
		<hr/>
Total		\$ 4420

Hatch Act.

Salaries	\$ 2400	
Incidentals and supplies and labor	1400	3800
		<hr/>
		\$ 8220

Poultry Husbandry.

Adams Act.

Salary of Assistant	\$ 700	
Poultry	200	
Feed	500	
Coal oil	100	1500
		<hr/>

Hatch Act.

Salary Head of Department.....	1000	
Labor	1000	
Poultry, feed and incidentals.....	1000	3000
		<hr/>
		\$ 4500

*Department of Agronomy.**Hatch Act.*

Salaries	\$ 1350	
Equipment and supplies	848	
Labor	3240	5438
		<hr/>

Special Expenditures for College Improvements:

Farm Team (Percheron mares)	1500	
Seed storage room and manure yard cover	600	
Farm fencing	2000	
Farm drainage	4000	
Root cellar—cement floor	200	
Completion Interior New Barn	1500	
Painting and repairing Old Barn and Piggery	500	10300
		<hr/>

*Dairy Husbandry**Hatch Act.*

Salary Head of Department	\$ 1000	
Assistants	2600	
Additional dairy cattle	1500	
Equipment and supplies	100	5200
		<hr/>

Department of Animal Husbandry.

Salaries	\$ 2200	
Live stock, feed and incidentals.....	1000	3200
		<hr/>

Printing, supplies and clerical assistance:

Salary of Printer	800	
Salary of stenographer and station clerk	840	
Salary of Assistant Stenographer	480	
Assistance in mailing bulletins.....	250	
Supplies, cuts, etc.	750	
Stamps and stationery	300	3420
		<hr/>

Department of Bacteriology.

Hatch Act.

Salaries	\$ 1700	
Supplies, equipment and assistance	850	2250

RECAPITULATION.

*Eastern Oregon Experiment Stations and
Demonstration Farms.*

Eastern Oregon Experiment Station, main- tenance for two years	\$10540	
Dry farming demonstration farm, main- tenance for two years	11500	
Demonstration farm at Hermiston, main- tenance for two years	3070	25110
College farm improvements and live stock.....		11800
		<u>\$36910</u>

Experiment Station.

Adams Act.

Department of Entomology	\$ 4850	
Department of Chemistry	3250	
Department of Horticulture.....	4420	
Department of Poultry Husbandry	1500	14020

Hatch Act.

Department of Entomology	1300	
Department of Chemistry	4500	
Department of Horticulture	3800	
Department of Poultry Husbandry.....	3000	
Department of Agronomy	5438	
Department of Dairy Husbandry	3700	
Department of Bacteriology	2550	
Department of Animal Husbandry	3200	
Printing, supplies and clerical assistance.....	3420	30908

Total estimate under Adams and Hatch Acts.... \$44928

Income.

Adams Fund, 1909	\$13000	
Hatch Fund	15000	
Sales, dairy, stock and fruit (estimated).....	2000	30000
Deficit		<u>\$14928</u>

For properly conducting the work of the Station and to meet the pressing demands from the various agricultural interests of the state, the following estimates are offered :

Assistant in Dairy Husbandry to co-operate with dairymen in an investigation of milk solids, testing and the manufacture of special classes of cheese, and expenses of operating dairy.....	\$2000
Additional assistance in the Department of Chemistry	2000
Field assistant for plant breeding, department of Agronomy	1500
Field assistant for co-operative work in the Departments of Horticulture and Entomology.....	1500
	<hr/>
	\$7000

Thus the Station actually needs for the best interests of the agricultural industries of the state an appropriation of at least \$7,000 annually.

In the event of the purchase of the 107 acres of land recommended and the establishment of the dairy there will probably be an increase revenue of two thousand dollars per year. However, the revenue of an Experiment Station should be regarded as an exceedingly minor matter. Much valuable work can be done by the Station in practical demonstration of dairying and horticulture which may not be revenue-producing and yet be of great value to the state at large.

Respectfully submitted,

JAMES WITHEYCOMBE,

Director of the Experiment Station.

REPORT OF THE FARMERS' INSTITUTES.

To the President of the College,

Sir: I beg to report that the following Farmers' Institutes were conducted under the auspices of this College for

the year 1907, from January first to December thirty-first inclusive:

<i>Date.</i>	<i>Place.</i>	<i>Date.</i>	<i>Place.</i>
Jan. 12	Roseburg	Sept. 11	Grants Pass
Jan. 30-31	Dufur	Sept. 16	Marshfield
Feb. 4	Tualatin	Oct. 4	Scio
Feb. 9	Harrisburg	Oct. 9	Vernonia
Feb. 11	Estacada	Oct. 10	Natal
Feb. 12	Damascus	Oct. 11	Fishhawk
Feb. 13	Logan	Oct. 12	Jewell
Feb. 14	Molalla	Oct. 17	Gresham
Feb. 15	Canby	Oct. 18-19	Scholls
Feb. 16	Oregon City	Nov. 5	New Era
Feb. 16	Beaverton	Nov. 6	Maple Lane
Feb. 20	Brooks	Nov. 7	Beaver Creek
Feb. 22	Junction City	Nov. 8	Needy
Feb. 23	Oak Grove	Nov. 9	Macksburg
Mar. 9	Irrigon	Nov. 12	Jefferson
Mar. 12	Turner	Nov. 13	Aumsville
Mar. 14	Sublimity	Nov. 14	Liberty
Mar. 15	Creswell	Nov. 15	Gervais
Mar. 30	Grants Pass	Nov. 16	Hubbard
May 18	Western Star	Nov. 19	Crabtree
	Grange	Nov. 20	Lebanon
May 24-25	Stayton	Nov. 21	Brownsville
June 4	Sherwood	Nov. 22	Halsey
June 5	Laurel	Nov. 23	Harrisburg
June 6	Forest Grove	Nov. 26	London
June 7	Banks	Nov. 27	Cottage Grove
June 8	Hillsboro	Nov. 29	Creswell
June 15	Vale	Nov. 30	Junction City
June 19	Grass Valley	Dec. 19	Scotts Mills
June 20	Moro	Dec. 27-28	Monmouth
June 21	Wasco		

Total number of Institutes held, 1907.....	60
Total number of sessions.....	157
Counties represented	16
Aggregate attendance of all sessions....	15,700

Services rendered by College Faculty, number of days, as follows:

Dr. W. J. Kerr.....	10 days
J. Withycombe	101 days

C. E. Bradley	59 days
C. I. Lewis	31 days
A. B. Cordley	12 days
James Dryden	6 days
Total	219 days

From January 1 to December 31, 1908, institutes were held as follows:

<i>Date.</i>	<i>Place.</i>	<i>No. Sessions.</i>	<i>Aggregate Attendance.</i>	
Feb. 1	Grants Pass	3	250	
Feb. 8	Wellsdale	3	150	
Mar. 7	Bellfountain	2	200	
Mar. 13	Toledo	1	100	
Mar. 21	Roseburg	2	250	
Mar. 28	Hermiston	1	75	
April 4	Medford	2	250	
June 6	Klamath Falls	2	300	
June 20	Butterville	2	75	
Sept. 2-3-4	Scio	3	1500	
Sept. 5	Oakland	1	175	
Sept. 11-12	Russellville	4	400	
Oct. 2	Medford	1	300	
Oct. 4	Canby	1	250	
Oct. 7	The Dalles	1	350	
Oct. 8-9	Mayville	2	300	
Oct. 13-14	Prineville	1	150	
Dec. 15	Baker City	2	250	
Dec. 16	Haines	2	175	
Dec. 17	Island City	3	150	
Dec. 18	Imbler	3	150	
Dec. 19	Cover	2	200	
Dec. 21-22	Hood River	3	270	
Dec. 28	Sublimity	3	450	
Dec. 30	Lebanon	3	350	7070

DEMONSTRATION TRAIN INSTITUTES.

<i>Date.</i>	<i>Place.</i>	<i>Attendance.</i>
May 11	Kent	250
	Grass Valley	260
	Moro	300
	Wasco	250

May 12	Condon	175	
	Clem	130	
	Lexington	335	
	Ione	450	
	Heppner	500	
May 13	Irrigon	250	
	Hermiston	250	
	Echo	450	
	Pilot Rock	250	
	Pendleton	225	
May 14	Milton	750	
	Weston	650	
	Athena	300	
	Adams	225	
Nov. 4	Hillsboro	250	
	Forest Grove	300	
	North Yamhill	500	
	Carlton	250	
Nov. 5	Newberg	2000	
	McMinnville	1000	
	Amity	450	
Nov. 6	Sheridan	300	
	Dallas	1500	
	Independence	1200	
	Wellsdale	75	
Nov. 7	Albany	250	
	Shedd	450	
	Harrisburg	1000	
	Junction City	500	
Nov. 9	Cottage Grove	650	
	Eugene	750	
	Springfield	650	
	Brownsville	1000	
Nov. 10	Jefferson	350	
	Salem	2250	
	Gervais	450	
	Woodburn	750	
Nov. 11	West Stayton	275	
	Silverton	1200	
	Hubbard	450	
	Aurora	450	25,250
Total number of Institutes, 1908.....		25	
Number of Demonstration Train Institutes.....		45	
Number of Sessions		98	

Number of counties represented	23
Aggregate attendance Farmers' Institutes.....	7,070
Aggregate attendance Demonstration Train Institutes	25,250
Total aggregate attendance	32,320

The institute work during the past two years has been very satisfactory, both in the matter of attendance and interest. There is no question as to the value of this work to the agricultural interests of the State. A wide range of subjects were presented, including mainly, however, The Home, Household Science, Education, General Agriculture, The Draft Horse, Dairying, Horticulture, Fruit Pests, Poultry, Farm Stock, Forage Plants, etc.

It is apparent from this report that much of the time of the Experiment Station Staff was given to institute work during the biennium. This unquestionably interferes with the work of investigation. However, it is important and highly necessary that the Station be represented at these institutes. The Station should be represented for two general reasons: first, it brings the farmer in close touch with the work of the Experiment Station; second, it enables the Station worker to ascertain more accurately the needs of the farmer.

There is a growing interest in the women's work at the institutes. I believe, however, it would be better if special institutes were held for women. At these institutes a representative of the Domestic Science and Art department of the College should be in attendance. Such institutes could be held during the pleasant season when the roads are in good condition; and, if held at places convenient for transportation, a large attendance will be secured and at the same time the institute workers could cover a large territory at minimum expense.

It would seem that in the interest of economy and efficiency it would be a good plan to place the general institute work in charge of some member of the Station Staff who is

in touch with all of the departments of the Station and to whom class work is not assigned. Such a person could soon inform himself as to the needs of different localities and could arrange a programme accordingly. In districts where agriculture is highly specialized, such as dairying and horticulture, he could call to his aid for important institutes the specialists of the Station. With the aid of one or two well qualified stockmen, and with the local assistance that may be available, a successful series of institutes could be conducted without seriously trenching upon the time of the Station workers.

Through the courtesy of the Oregon Railroad and Navigation Company and the Southern Pacific Company, we have been enabled to introduce during the past year a new feature of extension work by means of demonstration trains. One of these trains was operated in the wheat growing section of the Columbia River Basin and the other in the Willamette Valley. Both of these trains were well received by the farmers and the attendance exceeded our expectations. These demonstration trains proved to be a very effectual and popular means for presenting to a large number of farmers much material of educational value.

In Eastern Oregon the work consisted mainly of lectures on dry-land farming, rotation systems with wheat growing and the keeping of domestic live stock on the wheat farms, both for profit and for the rejuvenation of the soil.

The train operated in the Willamette Valley was strictly a demonstration train and perhaps the most elaborate and complete of anything of the kind seen on the continent. This consisted of a train of seven cars including a business car, day coach, sleeping car, and four cars of demonstration material, including a car equipped with modern dairy devices; a car furnished with a great array of agricultural exhibits; a horticultural car with charts and specimens of the principal fruit pests, model trees, and a large collection of material employed to demonstrate the correct methods of budding and grafting. At each stop a practical demon-

stration of apple packing was made; also a demonstration of the most approved methods of pruning. The fourth demonstration car was a miniature cow stable, equipped with two model stalls in which were stabled two high-classed cows. One of these cows was milked at each stop with a milking machine operated by a gasoline motor. The whole train was brim full of highly educational material and was an excellent example of a modern itinerant school on wheels.

It is contemplated by the Southern Pacific Company to co-operate with the Agricultural College in the operation of a similar train in Southern Oregon during the coming spring. This train will be especially designed for the purpose of demonstrating modern practice in horticulture and poultry husbandry.

Respectfully submitted,

JAMES WITHTYCOMBE,

Director of Farmers' Institutes.

REPORT ON HEAT, LIGHT, AND POWER.

To the President of the College,

Sir: In accordance with your request I beg to submit the following report on the heating plant of the College:

HEATING.

Central Heating Plant.

In 1899 the present central heating plant was installed for the purpose of heating the Mechanical Hall, Administration building, Armory, Greenhouse and Horticultural building and such other buildings as might be added later. When the Agricultural building was completed it was also added to the central system and last year the new shop building was attached.

The aggregate is about 16,000 sq. ft. of radiating surface not counting mains and returns. It is probable that the plant would carry about 4,000 sq. ft. of additional radiation if it were favorably located. In other words, one moderate sized building added to the present plant would tax it to the full capacity.

Underground Mains.

The steam mains and return pipes are covered with insulating material and enclosed in conduits. The portion of the conduit between the Administration building and boiler house is built of brick, oval in form, and about 30 inches by 24 inches. The branches beyond the Administration building are enclosed in terra cotta sewer pipes just large enough to contain the steam pipes with their insulation. It is evident that renewal or repair of these pipes is a very difficult matter. Also inspection is practically impossible except in the short section of brick conduit. In my report of last February, I called attention to the fact that the pipes in this conduit might be expected to give way at any time on account of pitting and corrosion. This predication was verified last week when nineteen feet of the four and one-half inch return pipe had to be replaced by new pipe. Discoveries made during this repair indicate that other sections of this pipe are in bad condition and liable to fail at any time. In fact we shall consider ourselves fortunate if we can keep the plant going, without interruption to college work, until next summer when it will be necessary to make extensive repairs. The estimate for these repairs is given in another section of this report.

Boilers.

The boilers, of which there are two 60-inch and one 52-inch, are in good condition, having been well cared for and not overworked. With ordinary repairs such as renewals of grate bars and door arches, these boilers should be expected to do good service for many years.

Location of Plant.

In view of the present trend of progress in building, the plant is not well located for a permanent central heating station for several reasons:

1—The locations of the new buildings and proposed buildings are too distant for economical transmission of heat.

2—The present location and design of the plant are such that it cannot well be enlarged to meet the larger demands for heat.

3—It is very inconvenient and expensive to get fuel to the boilers. The present method of having wood delivered to the College by team can only be considered temporary, in view of the fact that the cost is constantly increasing and the near supply diminishing. Even if this were not the case there is no suitable place near at hand to store the vast quantity of wood required to operate the plant during the winter. It is practically impossible to reach the plant with a spur from the railroad. When it becomes necessary to dispense with wood as a fuel and adopt coal or oil, this latter consideration will be of prime importance.

These disadvantages have been largely brought about by the growth of the College and the direction of the lines along which expansion has occurred. Agricultural Hall, Waldo Hall, and the Agronomy building have all been located and built since the heating plant was installed. These buildings are within the zone which should be heated by a central station. Their aggregate radiation is 14,000 square feet in round numbers, or two-thirds the capacity of the present plant. The Agronomy building with over 4,000 square feet and Waldo Hall with 6,000 square feet are heated independently on account of distance and lack of capacity of the central plant to supply heat to them.

Taking these matters into account it appears to be a poor investment from an engineering point of view to put more money into the old plant than that which is necessary to keep it going until another plant can be provided in a

location more suitable to meet the present and prospective requirements. Such a plant should be in accordance with the best modern practice and should be connected to the various buildings by tunnels large enough to permit the inspection and repair of pipes. The tunnels should also carry the various electric wires which are now strung upon unsightly poles about the campus.

Radiation.

The following is a detailed list of the radiating surface in the various buildings of the College. The first group comprises those buildings supplied by the present central plant.

	<i>Radiation Sq. Ft.</i>
Administration building	3,140
Agricultural Hall	3,839
Armory	2,010
Horticultural building and Greenhouse.....	1,587
Mechanic Arts building	3,170
Mechanical Hall	2,064
Mining building	370
Total	16,180
Not connected with main heating plant:	
Cauthorn Hall	1,350
Waldo Hall	6,000
Agronomy building	4,340
Shepard Hall	3,000
	14,690

Heated by stoves:

Pharmacy building and Mining laboratory.

It will be noted that exclusive of the buildings heated by stoves, we now have almost as much radiation heated independently as we have supplied from the central plant.

Cauthorn Hall.

It is doubtful if it would be profitable to heat Cauthorn Hall from a central station, on account of the distance and

the nature of the building. However, the heating apparatus in this building is in bad condition. The boiler has been in continuous use since the building was first occupied in 1890. It should be reset next summer and the steam mains overhauled and given proper slope to prevent accumulation of water in them. I anticipate that it may be found necessary to replace the boiler by a new one.

Estimated cost per annum of heating College buildings.

Present Heating Plant, Fuel.....	\$2,814.00	
Labor	450.00	\$3,264.00
Waldo Hall, Fuel.....	900.00	
Labor	180.00	1,080.00
Shepard Hall, Fuel.....	390.00	
Labor	180.00	570.00
Agronomy building, Fuel.....	630.00	
Labor	180.00	810.00
Armory, for hot water, Fuel.....	75.00	
Labor	100.00	175.00
Pharmacy building, Fuel	187.00	
Labor	90.00	277.00
Cauthorn Hall, Fuel	500.00	
Labor	180.00	680.00
Total for one year		\$ 6,856.00
Total for two years		\$13,712.00

These estimates are based on wood at \$3.75 per cord, except that used at the heating plant which is hauled in during the winter at a cost of about 60 cents per cord, making the total cost per cord at the heating plant \$4.35.

Estimate of repairs to heating system for next two years.

Renewal of steam and return pipes in first section of conduit and return pipes in second section	\$ 525.00
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Repairs to boilers consisting of grate bars and arch liners	120.00
Repairs to heating plant for Cauthorn Hall which is practically worn out	500.00
Repairs on water and drain pipes at Waldo Hall..	200.00
Miscellaneous repairs	100.00
Total	<u>\$1,445.00</u>

The estimates for repairs to a worn out plant are likely to be far from the actual requirements, but the figures here given are the most reliable to be had at this time.

LIGHT AND POWER.

To make an accurate estimate of the outlay for power and lighting for the next two years is not an easy task. There are two reasons for this statement: (1) The College is growing so rapidly that it is difficult to estimate the extent of the requirements; (2) There are no exact records of past expenditures to follow in the matter.

Upon taking possession of the new shops last spring it became necessary to seek some other source of light and power than our own plant, the capacity of which was considerably exceeded. Accordingly, a contract was entered into with the Willamette Valley Company whereby they agree to supply current to the College at the switchboard for two cents per kilowatt hour with a specified minimum charge. It is also a part of the agreement that the College may use its engine and generator up to the full capacity in producing a part of the required current. This arrangement has been carried out quite satisfactorily except that the College generator is unable to carry the motor load on account of not having an automatic voltage regulator to take care of the variable motor load.

At the present time all of the current used for lighting is generated at the College plant, the exhaust steam being used for heating the buildings. Were it not for the fact that the exhaust steam is utilized in this way and that the attendance in the boiler room is practically the same whether

the engine is running or not, it is certain that no economy would result from the use of the College plant in furnishing a part of the power. As the matter now stands we are probably justified in using it during the season when heat is required. The margin of gain even then is so small that in making the estimates for the next two years, I have estimated current at two cents per kilowatt hour whether generated at the College plant or purchased of the company.

The various shops and the printing office are supplied with three phase induction motors as follows:

Blacksmith shop, one 20 H. P. and one 10 H. P.....	30 H. P.
Wood shop, two 15 H. P. motors	30 H. P.
Machine shop, one 20 H. P. motor	20 H. P.
Printing office, one 5 H. P. motor	5 H. P.
Total	85 H. P.

It is not at all probable that all of these motors will be running at their full capacity at the same time. I should say that 60 H. P. would be a fair estimate for the maximum.

In the following, power is estimated on the basis of eight hours per day during five days of the week for thirty-six weeks:

Estimated cost per year.

Blacksmith shop	\$ 635.00
Machine shop	345.00
Wood shop, including an allowance for summer work	500.00
Printing office	75.00
Total	\$1,555.00

Requirements for Lighting.

Observations recently made by Mr. Hawley indicate that the College now requires about 20 kilowatts for lighting. During the shortest days, lights are used seven hours a day. During the school year of thirty-six weeks, the average is about five hours per day. On this basis the average cost of lights per day is \$2.00 or \$504.00 per year. Allowing an

increase of approximately ten per cent for the next two years, the amount is \$550.00 per year.

Summary for Light and Power for two Years.

Current for power	\$3,110.00
Current for lighting	1,100.00
Lamp renewals and repairs	200.00
Total	<u>\$4,410.00</u>

An automatic voltage regulator would enable the College engine and generator to be used on the motor circuit as well as on the power circuit. I believe that it should be added to the equipment. The cost would be about \$175.00, which is not included in the other estimates.

Respectfully submitted,

G. A. COVELL.

DEPARTMENTAL ESTIMATES OF REQUIREMENTS

FOR THE BIENNIUM

JULY 1, 1909 TO JUNE 30, 1911.

The following are estimates of the equipment, supplies, and additional instructors and assistants, required during the next two years, as prepared by the heads of the respective departments. While these estimates are very conservative and all the items given are badly needed, it has been found necessary, on account of the unavoidable large increase in the cost of maintenance, occasioned by the rapid growth of the institution, and the necessity of providing additional buildings, to make large reductions in the amounts given, as indicated elsewhere in this report. The cost of supplies is mostly covered by student fees, but the lists are given here as a matter of information.

AGRONOMY.

Additional Instructional Assistance—

One instructor	\$2,500.00
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Equipment—

For work in Crops, Crop Production, Cereal Crops,
Agrostology:

Cases for specimens of crop diseases, crop in-		
sects, and weed enemies	\$ 50.00	
Cases for crop types specimens.....	20.00	
Cases for seed collections ..	50.00	
Five laboratory desks	100.00	
Dissecting microscopes	100.00	
Three analytical balances	140.00	
Seed separating machine	75.00	
Miscellaneous	144.00	679.00

For work in Irrigation and Drainage:

One transit	\$ 140.00	
Two R. R. levels	170.00	
Three measuring rods	45.00	
Six drawing tables	60.00	
Miscellaneous	55.00	470.00

For work in Soil Physics:

100 Percolators	\$ 55.00	
Sieves, aspirator, evaporating dishes, capil-		
lary tubes, apparatus for determining soil		
moistude, etc.	614.00	669.00

For work in Soil Fertility:

Universal clamps, Bunsen burners, condensers, pip-		
ettes, filtering flasks, etc.		295.00

For work in Farm Mechanics:

Shafting and pulleys, tractometer, draft apparatus,		
belting, tools, etc.		360.00

For work in Climatology:

Thermograph	\$ 75.00	
Standard barometer	50.00	
Wet and dry bulb thermometer, etc.	12.00	137.00

For general use in department:

Stereoptican	\$ 60.00	
Slides and curtain	40.00	
Two roll-top desks for office	100.00	
Bookcasing for offices	60.00	
Filing cases, desk chairs, and two tables.....	65.00	325.00

Books—

Technical reference books for library.....		66.85
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Supplies—

Seed supplies, seed vials, labels, paper, etc.	\$ 54.00	
Centerfuge tubes, thermos, flasks, chemicals	100.00	
Lubricating oil, gasoline, lumber, cement, waste, etc.	117.00	
Crucibles, wire gauzes, etc.	58.64	
Stationery, stamps, etc., for office.....	220.00	549.64

ANIMAL HUSBANDRY.

Additional Instructional Assistance—

One instructor	\$2,400.00
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Books—

Technical reference books for library.....	50.00
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Live Stock—

Six Herefords	\$1,000.00	
Six Ayrshires	900.00	
Six Holsteins	900.00	
One Galloway heifer	150.00	
One Aberdeen Angus heifer	150.00	
One team of Percheron mares ..	1,500.00	
One Poland China sow	50.00	
One Duroc Jersey sow	50.00	4,700.00

<i>Supplies</i>	50.00
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HORTICULTURE.

Additional Instructional Assistance—

One instructor	\$1,800.00	
Student laboratory assistance	300.00	\$2,100.00

Equipment—

Furniture for five offices, including desks, chairs, bookcases, cabinets, typewriter, etc.....\$	425.00	
Refrigerator for fruit storage	50.00	
Benches and desk for station laboratory	150.00	
Equipment for spraying, grafting, pomology, and vegetable gardening laboratories	500.00	
Drafting room tables	100.00	
Herbarium cases and press	50.00	
Lantern equipment	100.00	
Tools for budding, grafting, etc.	200.00	
Miscellaneous equipment	125.00	1,700.00

Books—

Technical reference books for library.....	100.00
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Supplies—

Photography	\$ 100.00	
Lantern slides	100.00	
Fruit packing material, nursery material, etc..	125.00	
Incidentals	200.00	525.00

DAIRY HUSBANDRY.

Additional Instructional Assistance—

One instructor	\$2,400.00	
Special instructors	750.00	
Student assistance	250.00	\$3,400.00

Equipment—

Cream separators	\$ 150.00	
Two 100-gallon steel and copper cheese vats.....	160.00	
Automatic cream ripener	190.00	
Starter can	40.00	
American butter printer	25.00	
Babcock tester, with electric motor.....	75.00	
Set pipe-fitting tools	20.00	
Acid carboy trunion and small butter printer....	7.50	
Reading room and museum fixtures.....	100.00	
Office fixtures and supplies	100.00	867.00

Books—

Technical reference books for library	75.00
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Supplies—

Sulphuric acid and other chemicals.....	\$ 125.00	
Glassware for test room	200.00	
Milk and cream	150.00	
Buttermaking and cheesemaking supplies	150.00	
Wood, 25 cords at \$4.00	100.00	725.00

POULTRY HUSBANDRY.

Additional Instructional Assistance—

One student assistant	\$ 500.00
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Improvements—

House for fowls and providing fruit and shade trees.....	250.00
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Equipment—

Fowls of different breeds	\$ 100.00	
Charts, slides, etc.	100.00	
Carpenters' tools	20.00	
Two desks	50.00	
Bone cutter	30.00	
Clover cutter	15.00	
Cramming machine	25.00	340.00

Supplies—

Feed for fowls	\$ 125.00	
Lumber and material for houses and appliances to be built by students.....	200.00	
Coal oil for incubators and brooders.....	50.00	
Printing records, score cards, etc.....	25.00	400.00

AGRICULTURAL CHEMISTRY.

Additional Instructional Assistance—

One-half time of one instructor.....	\$1,000.00
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Repairs—

Removing partition	\$ 25.00	
Installing three desks	150.00	
Providing new drawers in present desks.....	50.00	
Providing two iron supporting posts.....	40.00	
Installing hoods and sink	65.00	330.00

Equipment—

5 Quantitative balances	\$ 200.00	
1 Westphal balance	12.00	
Balances and weights	60.00	
4 Platinum dishes, large	100.00	
8 Platinum dishes, small	50.00	
Drying ovens	40.00	
1 Nitrogen still	33.00	
1 Fat extraction apparatus	30.00	
Muffle furnaces and Erdman muffles.....	40.00	
1 Gasoline tank and 2 Richard's pumps.....	38.00	
2 Hot plates	20.00	
40 Bunsen burners	15.00	
1 Set hydrometers	15.00	
1 Calorimeter	80.00	
3 Sets soil sieves	15.00	
30 Ring stands	60.00	
Thermometers and tripods	22.00	
4½ Gross reagent bottles	61.00	
10 Doz. porcelain crucibles	30.00	
3 Doz. desiccators	21.00	
30 Burette stands	75.00	
3 Doz. Burettes	31.00	
Funnels, common and separatory.....	52.00	
6 Doz. graduated flasks	33.00	
3 Doz. mortars	10.00	
9 Doz. pipettes	20.00	
1 Gross evaporating dishes	48.00	
Kjeldahl and Florence flasks	34.00	
90 Nests beakers	30.00	
2 Doz. potash bulbs	30.00	
Casseroles and Nessler jars	25.00	
3 Doz. filter flasks	15.00	
4 Doz. graduated sylinders	40.00	
3,500 filters	15.00	
2 Doz. soxlet extractors	30.00	
Specific gravity bottles and cylinders	10.00	
Miscellaneous small apparatus	116.00	1,556.00

Supplies—

Chemicals	350.00
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DOMESTIC SCIENCE AND ART.

Additional Instructional Assistance—

Assistant in Science (one year)	\$1,000.00	
Assistant in Cookery	1,600.00	
Assistant in Dressmaking, and Tailoring.....	2,000.00	\$4,600.00

Equipment—

For Science Laboratory:

10 compound microscopes	\$ 400.00	
Bacteriological equipment, chiefly glassware..	50.00	
Miscellaneous equipment	50.00	
Physical apparatus	100.00	
Hygiene and Home Nursing equipment.....	500.00	1,100.00

Kitchen and Dining Room:

18 gas burners and miscellaneous equipment....	\$ 40.00	
12 tables	24.00	
Gas stove	20.00	
Utensils, burners, etc.	52.00	
China	20.00	
Silver, curtains, rug, serving table.....	34.00	
Side board	20.00	
Chairs	45.00	255.00

Sewing, Dressmaking, Tailoring, Millinery, etc.:

Tables and chairs	\$ 90.00	
6 sewing machines	118.00	
600 pounds of drafting paper	30.00	
2 doz. drafting squares and 4 doz. scissors.....	72.00	
Cases for exhibition of materials and work....	50.00	
Looms	50.00	
Exhibition material in basketry, tapestry, weaving, etc.	50.00	460.00

<i>Books</i>	100.00
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Supplies—

Reed, raffia, jute, twine, rope, grasses, etc.....	\$ 125.00	
Wire, braids, etc.	50.00	
Supplies for cooking laboratories, office, etc.....	425.00	600.00

MECHANICAL ENGINEERING AND SHOPS.

Additional Instructional Assistance—

Instructor in Moulding and Foundry Practice.....	\$2,000.00	
Instructor in Wheelwright Work.....	2,000.00	
Instructor in Plumbing and Pipe-fitting.....	2,000.00	
Assistant in Wood Shop	1,400.00	
Student assistance in Mechanical Drawing.....	600.00	\$8,000.00

Equipment—

For work in Hydraulics:

1 Breslau water meter, two-inch.....	\$ 85.00	
1 Worthington water meter, two-inch.....	100.00	
1 Centrifugal pump	75.00	
2 Gas meters	60.00	
Pelton wheel, hydraulic ram, gauges, etc.	158.00	478.00

For work in Steam Engineering:

1 Standard mercury column	\$ 25.00	
3 Pressure gauges, 100-lb., 200-lb., and 300-lb.	60.00	
1 Separating calorimeter	50.00	
1 Electric Pyrometer	95.00	
1 Doz. 12" thermometers	20.00	
1 Continuous calocimeter	50.00	
2 Steam Engine indicators, reducing wheel attached	190.00	
1 Plain slide valve engine 6" x 8".....	250.00	
1 20 H. P. surface condensor with pumps.....	300.00	
Steam and vacuum gauges, and other miscellaneous equipment	178.00	1,218.00

For work in Gas Engineering:

1 5 H. P. gas engine	\$ 150.00	
1 Gas engine indicator with reducing motion..	100.00	
1 Air compressor, 6" x 6"—8" with storage tank	300.00	
1 Rider Ericson hot air engine.....	150.00	
1 Fuel calorimeter and apparatus for gas analysis	130.00	830.00

For work in Power Measurements:

2 Fairbank's Standard Platform scales.....	\$ 60.00	
1 Transmission dynamometer	150.00	

1 Tachometer	65.00	
1 5 H. P. induction motor	80.00	
Speed indicators and other small apparatus....	70.00	425.00
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For work in Lubricants:		
Oil testing machine	\$ 175.00	
Cold test apparatus	30.00	
Viscometer	40.00	
Miscellaneous apparatus	20.00	265.00
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For work in Strength of Materials:		
1 Paine Extensometer	\$ 25.00	
1 Set standard weights	10.00	
1 Set sieves, and specific gravity Bot.....	25.00	
1 Chemical balance	50.00	
Miscellaneous apparatus	11.00	
1 Machine for grinding cubes for testing machine	350.00	471.00
<hr/>		
For Wood Shop:		
20 Wood turning lathes at \$40.00.....	\$ 800.00	
Tool cabinets for same (made in Shops).....	93.00	
1 Heavy band saw for re-sawing.....	325.00	
1 Surface planer	350.00	
1 Band saw swage and sharpener.....	30.00	
1 Circular saw swage	30.00	
3 Universal patternmaker's vises	45.00	
10 Pair Herriman's vises	110.00	
1 Circular saw hammering outfit.....	40.00	
3 Circular saws	20.00	
3 Band saw blades and 2 grindstone dressers	11.00	
9 Sets common hand tools at \$5.92.....	53.28	
9 Sets Special tools needed to complete present equipment	54.00	
40 Combination steel rules	44.00	
40 Bevel gauges and 24 oilers	24.80	
25 Combination steel rulers for lathes.....	27.50	
25 Oilers for lathes	5.00	2,062.58
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For Blacksmith Shop:		
1 Power hammer	\$ 275.00	
1 Combined punch and shear	130.00	
Pulleys and shafting	30.00	435.00
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ESTIMATES OF REQUIREMENTS

201

For Machine Shop:

6 14" lathes (engine)	\$2,730.00	
1 14" Turret lathe	825.00	
1 Sensative drill	60.00	
1 12" Crank shaper	350.00	
1 14" Power hack saw	75.00	
1 Electric center grinder	50.00	
1 Wet tool grinder	225.00	
8 Machinists' vises	96.00	
2 10" 4-jaw combination chucks	30.00	
6 10" and 1 6" plain chucks.....	82.00	
4 3" tail stock chucks	32.00	
1 ½" Drill press chucks	5.00	
1 Set standard disc and plug gauges	75.00	
4 Micrometer calipers	24.00	
1 Micrometer square	5.00	
Cutters for milling machine and expanding mandrels	40.00	
3 Doz. ball peen hammers 1¾ lb.....	27.00	
3 Doz. solid steel squares 1½".....	54.00	
3 Doz. adjustable steel squares 4".....	89.00	
2 Doz. 6" steel scales	10.80	
5 Doz. 10" steel scales	45.00	
4 Doz. Center gauges	9.60	
5 Doz. Armstrong tool holders (Square).....	75.00	
5 Doz. Armstrong tool holders (cutting off)	69.00	
4 Doz. outside, and 4 doz. 4" inside calipers..	57.60	
5 Doz. slip oil stones.....	15.00	
3 Doz. 12" hand bastard files	32.10	
3 Doz. 12" second cut files.....	34.50	
3 Doz. 12" hand smooth files.....	40.50	
5 Doz. 6" pillar smooth files	16.25	
5 Doz. 8" half round smooth files.....	44.50	
5 Doz. 5" square second cut files	23.00	
Assorted small files	5.00	5,351.25

For Foundry:

1 30" Cupola complete	\$ 625.00	
1 Core oven 6' x 6'	80.00	
1 Brass furnace and crucibles.....	125.00	
2 Large pouring ladles	40.00	
10 Small pouring ladles	35.00	
10 sets of tools consisting of shovel, rammer, brushes, sieves, trowel, slick, and pulling tools	57.50	962.50

For Wheelwright Shop:

10 Bench sets, consisting of vise, planes, draw knife, bitts, brace, auger, squares, chisels, saws, etc., at \$41.65 per set	\$ 416.50	
2 8" sledges, 2 10" sledges, bench hatchets, clamps, tire shrinker, tire bender, clip-pers, etc.	84.50	
1 Combined punch and shear	35.00	
1 Drill press	50.00	
2 Tire bolters	15.00	
3 Tire measuring wheels	3.00	
1 Green River screw plate	16.00	
2 Blacksmith vises	15.00	
2 Swedge blocks	12.00	
1 Power grindstone	35.00	
1 Emery grinder	30.00	
1 Pressure blower	40.00	
1 Set small tools consisting of swedges, fullers, chisels, etc.	20.00	
Shafting, hangers, pulleys and belting.....	75.00	
Remodelling six old forges at \$12.....	72.50	
1 10 H. P. three phase induction motor.....	235.00	
10 Benches with drawers	120.00	1,274.00

Miscellaneous:

1 Electric blue print machine, 42" x 72".....	\$ 220.00	
1 Vacuum printing frame, 38" x 50".....	80.50	
50 Wire mesh window guards for wood and machine shops	156.00	
2 Cabinets for drawing department and benches, drawers, etc., for Eng. Lab. (to be made in the Wood Shop).....	83.00	
Book case, cabinet, and furniture for Dean's office	125.00	664.50

Equipment for Drafting Room.

40 Drawing tables	280.00
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Books—

Technical reference books for library.....	125.00
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Supplies—

For Wood Shop:

20,000 feet yellow fir lumber @ \$35.....	\$ 700.00
10,000 feet oak lumber @ \$50.....	500.00

ESTIMATES OF REQUIREMENTS

203

10,000 feet pine	@ \$45.....	450.00	
8,000 feet alder	@ \$40.....	320.00	
5,000 feet other lumber	@ \$50.....	250.00	
Dowels		25.00	
Glue		30.00	
Wood and leather fillet for patterns.....		25.00	
Finishing materials		200.00	
Hardware		200.00	
Upholstering materials		125.00	
Miscellaneous material used in copper, brass, and Venitian iron work		100.00	2,925.00
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For Blacksmith Shop:			
19,800 lbs. of iron and steel.....	\$	680.00	
50 tons blacksmith coal @ \$17.....		850.00	1,530.00
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For Machine Shop:			
4,000 lbs. castings	\$	200.00	
Wrought iron, steel, and brass.....		125.00	
Files, screws, and nuts		150.00	
2 Bales cotton waste		12.00	
1 Barrel machine oil		18.00	505.00
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CIVIL ENGINEERING.

Additional Instructional Assistance—

One instructor	\$2,400.00	
Two field assistants at \$600 each per year.....	2,400.00	4,800.00
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Books—

Technical reference books for library	500.00
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Equipment—

1 Precision level	\$ 190.00
2 Planetables, complete @ \$177.70.....	355.40
2 Dumpy levels @ \$110.00	220.00
2 Y levels @ \$140	280.00
2 Transits with solar, etc., @ \$325.00.....	650.00
Plain transits (4) @ \$180.....	720.00
1 Aneroid barometer	55.00
1 Aneroid barometer	20.50
1 Sextant	90.00
10 Tapes, 100 feet	42.25

1 Tape, 500 feet	20.00	
4 Tapes, 66 feet	11.00	
5 Tapes, 50 feet	12.50	
12 Axes	15.00	
1 Blue print frame and outfit	125.00	
36 Drawing boards	36.00	
6 Level rods	84.00	
Flagpoles, pocket compasses, thermometers, rod levels, and minor instruments	75.00	
1 Current meter	80.00	
Equipment for instrument room	125.00	3,206.65
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<i>Repairs—</i>		
Miscellaneous repairs on instruments, etc.....		25.00
<i>Supplies—</i>		
Blue print paper for two years.....\$	40.00	
Drawing paper	40.00	
Tracing paper and cloth	35.00	
Notebooks (300)	165.00	
Incidentals	200.00	480.00
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ELECTRICAL ENGINEERING.

<i>Additional Instructional Assistance—</i>		
One instructor		2,600.00
<i>Equipment—</i>		
6 Thompsons indicating wattmeters with multi- pliers	\$ 540.00	
2 High grade millivoltmeters and shunts 10, 50, M. V.	120.00	
10 Ordinary millivoltmeters and shunts 10, 10, 20, 20, 25, 25, 40, 40, 50, 50, M. V.....	300.00	
10 A. C. Ammeters, 5, 5, 5, 10, 10, 10, 30, 30, 30, 50	250.00	
10 D. C. Ammeters, 5, 5, 5, 10, 10, 10, 30, 30, 30, 50	250.00	
1 3 Phase G. E. 10 K. W. Double Current gener- ator set	530.00	
2 C. E. Alternating current generator sets.....	1,650.00	
2 10 K. W. D. C. Generators complete	750.00	
4 10 K. W. 3 Phase induction motors.....	875.00	
1 Standard testing set, Bridge and galvanometer	140.00	

1 Ordinary testing set, Bridge and galvanometer	110.00	
1 10 K. W. arc transformer.....	175.00	
6 5 K. W. transformers	600.00	
6 Types of arc lamps at \$18.00.....	108.00	
8 Types of watt hour meters at \$16.00.....	128.00	
3 Electrodynamometers at \$30.00	90.00	
1 Three phase oscillograph complete	750.00	
1 Power factor meter	60.00	
1 Frequency meter	60.00	
1 Synchroscope	60.00	
1 Ohmmeter	90.00	
1 Kelvin static voltmeter for high voltages.....	80.00	
1 Kelvin multi-cellular voltmeter for low voltages	150.00	
1 Hysteresis meter	110.00	
1 Static ground detector	60.00	
3 Types of telephone switchboards complete with instruments and other apparatus	400.00	
2 Wireless telegraph sets including induction coils, etc.	250.00	
1 Storage battery	310.00	
1 Standard Condenser 1-M. F.	90.00	
2 Condensers 1-M. F. at \$45.00 ea.....	90.00	
1 3 Phase 70 Amp. circuit breakers.....	90.00	
1 3 Phase 10 K. W. transformer	225.00	
3 D. P. Single phase circuit breakers.....	63.00	
5 D. P. Direct current circuit breakers.....	100.00	
5 Rheostats for testing dynamos at \$25.....	125.00	
3 Potential transformers at \$15.....	45.00	
3 Current transformers at \$15.....	45.00	
2 Tirrell regulators at \$150	300.00	
1 Transmission dynamometer	100.00	
1 Slip Meter	65.00	
1 Class room lantern complete	175.00	10,509.00
<i>Books</i>		430.00
<i>Supplies—</i>		
Wire, rosettes, sockets, small castings, etc.....		1,000.00

MINING ENGINEERING.

Additional Instructional Assistance—

One instructor	1,300.00
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Equipment—

3 Mining transits complete	\$ 825.00	
2 Tapes, 300 feet	30.00	
Tapes, 4 100 feet	32.00	
4 Tapes, 50 feet	16.00	
6 Axes	6.00	
2 Solar attachments	100.00	
1 Shaft plumbing apparatus	25.00	
Collection of rocks for Lithology.....	150.00	
Cases for same	60.00	
2 Brunton transits	50.00	
1 Aneroid barometer	30.00	
2 Petrographic microscopes	300.00	
Collection of rock sections	80.00	1,704.00

Books 395.00

Supplies—

Supplies for Mineralogy and Assaying..... 800.00

COMMERCE.

Additional Instructional Assistance—

Instructor in Penmanship and Accounting.....	\$1,600.00	
Student labor	500.00	
Increase in salary of instructor in Stenography..	300.00	2,400.00

Improvements—

1 Corbin door check	\$ 4.00	
50 Lockers	150.00	154.00

Equipment—

20 Typewriter stands	\$ 110.00	
50 Chandler's Adjustable chairs	145.00	
Express and materials for Commercial Museum	100.00	
Equipment for Commercial Museum and depart-		
ment Library shelving, cases, and bottles.....	200.00	
Globe Wernicke Filing Cabinet (4 sections).....	90.00	
10 Sets inkwells @ \$2.00.....	20.00	
Books for Offices, rubber stamps, etc.....	50.00	
Equipment for exhibits, cases, etc.....	25.00	740.00

Books for Library 200.00

Supplies—

Ink, paper, pens, etc.	\$ 400.00	
Rental on twenty machines	500.00	900.00

FORESTRY AND BOTANY.

Additional Instructional Assistance—

Assistant in Botany	\$1,000.00	
Assistant Professor of Forestry	2,400.00	3,400.00

Land—

Forest and nursery (40 acres)		4,000.00
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Equipment—

For Office:

Filing cases	\$ 62.50	
Desk	35.00	
Chairs	14.00	
Table	8.00	119.50

For Botany

Tables, single, for laboratory	\$ 128.00	
Chairs, revolving	48.00	
Herbarium cases	250.00	
Cases for botany sets	65.00	
Lockers for microscopes	325.00	
12 Individual laboratory sets	318.60	
Transpiration shells	7.50	
Spectroscope	18.00	
Leafclasp	6.50	
Manometer and light screen	11.00	
Photosynthometer	5.00	
Cambridge app boxes (30)	21.50	
Assortment laboratory supports	50.00	
Cambridge clinostat and polymeter	30.00	
Psychograph, Draper	30.50	
Photometer and Self-recording thermometer	35.00	
Sun recorder	35.00	
Thermograph	30.00	
Dissecting microscopes (10)	120.00	
Compound microscopes (8)	440.00	
Miscellaneous small pieces	15.55	1,989.05

For Forestry:

*1 Riehle testing machine	\$ 800.00	
*1 Tinius testing machine	400.00	
*1 Circular saw complete	120.00	
1 Drying oven	80.00	
1 Weighing scale	65.00	
1 Deflectometer and scales	30.00	
1 Micrometer	30.00	
5 Calipers	25.50	
2 Clinometers	13.00	
Mountain barometer	56.25	
2 Hypsometers	48.00	
3 Steel tapes	27.00	
3 Increment borers	18.00	
Binocular	54.00	
2 Compasses	31.00	
2 Field balances	14.00	
2 Horses	250.00	
2 Pack saddles and blankets.....	30.00	
Saddle and hobbles	30.00	
Tents and flies (3)	50.00	
Camp and kit extras	48.00	
Set of small tools	100.00	
Miscellaneous small items of equipment.....	38.75	
Three pack straps	6.00	
2 Nose bags	2.00	
Watson plant presses and Cambridge picks....	11.75	
Branton pocket transit	25.00	
Camera for field work	112.00	
Chairs, revolving, tablet, and stools.....	116.00	
Tables, single and special for laboratory (24)	232.00	
Seed cases	25.00	
Storage cupboards	60.00	
Supply cupboards	80.00	
Lantern slides	35.00	
Miscellaneous small pieces	29.75	3,093.00

Books—

For Botany	\$ 32.00	
For Forestry	500.00	532.00

*Mechanic Arts equipment to be used instead of purchasing these items for Forestry.

Supplies—

For Botany	\$ 131.65	
For Office	9.60	
Forestry	33.30	174.55

PHARMACY.

Equipment—

1 Gross Erlenmeyer flasks	\$ 20.00	
5 Gross Ointment boxes	10.00	
1-6 Gross Thermometers	24.00	
1-6 Gross Mortars	22.00	
1-6 Gross Glass funnels	15.00	
5 Gross Collapsible tubes	40.00	
25 lbs. corks	15.00	
2-3 Gross Evaporating dishes	30.00	
2-3 Gross Spatulas	20.00	
5 Gross assorted bottles	25.00	
2 Gross reagent bottles	20.00	
1-6 Gross percolators	11.00	
1-6 Gross gas burners	21.00	
1-12 Gross Precip. jars	15.00	
1-3 Gross graduates	40.00	
1 Machine for coating pills and tablets	40.00	
1 Steam jacketed kettle	50.00	
4 Balances	80.00	
4 Sets weights	12.00	
1 Numbering machine	5.00	
1 Supposit. machine	10.00	
1 Drug mill	45.00	
1 Motor and outfit	165.00	
Glass tubing	15.00	
Rubber tubing	20.00	773.00

<i>Books and periodicals for library</i>	66.00
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Supplies—

Chemicals, crude drugs, and general supplies	750.00
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ZOOLOGY.

Additional Instructional Assistance—

One instructor	\$2,400.00	
Student assistance	200.00	2,600.00

Equipment—

38 Laboratory tables (4 students each) @ \$40.....	\$1,520.00	
60 Compound microscopes @ \$50.....	3,000.00	
60 Dissecting microscopes @ \$12.....	720.00	
24 Sets desk equipment @ \$10.....	240.00	
5 Demonstration tables	150.00	
1 Long reading table	30.00	
8 Hand microtones @ \$6.....	48.00	
75 Laboratory chairs	225.00	
150 Lecture room chairs	350.00	
1 Aquarium table and equipment	100.00	
Models, charts, and slides	100.00	
100 Dissecting boards @ 75c	75.00	
50 Exhibition cases for collections.....	100.00	
Wall cases, lockers, etc., for laboratory.....	250.00	
Hoods, special plumbing, etc	200.00	
Office furniture	300.00	
Miscellaneous equipment	161.00	7,569.00

Books for Library—

Biology	\$ 75.00	
General Zoology	100.00	
Vertebrate Zoology, game animals, birds & fishes	75.00	
Physiology and anatomy of domestic animals.....	50.00	
Human physiology, hygiene and sanitation.....	150.00	
Psychology and ethics	50.00	
Embryology	75.00	
Principles of breeding	50.00	
Entomology, forest insects, crop pests, etc.....	400.00	1,025.00

Improvements—

Insectary	1,500.00
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Supplies—

General supplies for department; also including bee hives, etc., for work in Bee Keeping	400.00
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CHEMISTRY.

Additional Instructional Assistance—

Three instructors (\$1,000 each)	6,000.00
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Improvements—

Providing small individual hoods on desks in laboratory	\$ 150.00
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ESTIMATES OF REQUIREMENTS

211

Putting floor in general laboratory	100.00	
Plumbing	175.00	
Kalsomining laboratories and recitation rooms..	150.00	
Enlarging Organic laboratory, etc.	125.00	
Enlarging stock room	50.00	
Providing closets	50.00	
Arranging lights in general laboratory.....	75.00	
Arranging hoods in Organic laboratory.....	50.00	
Installing dumb waiter from stock room.....	100.00	
Installing sinks in laboratories.....	75.00	1,100.00
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<i>Equipment—</i>		
Small boiler for distilling water	\$ 200.00	
Small motor and fan for ventilation.....	75.00	
Desks, etc., for Quantitative laboratory	300.00	
Filing cabinet for office	60.00	
Book case for department	50.00	
Desk for instructor	35.00	
Table for office	15.00	
Window blinds for laboratory	30.00	765.00
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<i>Books for Library</i>		200.00
<i>Supplies—</i>		
Chemicals and other general supplies		7,922.00

BACTERIOLOGY.

<i>Additional Assistance—</i>		
Student laboratory assistance		600.00
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<i>Equipment—</i>		
25 Glass top tables	\$ 200.00	
1 Lead covered dissecting table	10.00	
25 Screw top stools	80.00	
4 Cupboards for glassware	60.00	
50 Student lockers	100.00	
2 Metal covered benches, with hoods, etc.....	60.00	
2 Benches and hoods for incubator room.....	40.00	
Office desks, chairs, etc.	61.00	
15 Compound microscopes	1,500.00	
15 Dissecting microscopes	180.00	
15 Reserve flame burners	30.00	
15 Sets reagent bottles	30.00	

1 Microtome	75.00	
1 Set fine balances with weights.....	60.00	
1 Set coarse balances and weights.....	15.00	
Dissecting knives, scissors, needles, etc.....	45.00	
3 Doz. test tube baskets	14.40	
6 Doz. Fermentation tubes, large size	25.00	
Fermentation tubes, medium and small sizes.....	45.00	
6 Gross test tubes	27.00	
Beakers and glass jars	126.00	
1 Gross pasteur dishes	36.00	
Forceps, trays, etc.	30.00	
2 Autoclaves, large and small	130.00	
3 Arnold Sterma sterilizers	52.00	
2 Hot air sterilizers	90.00	
1 Medium sized incubator	50.00	
1 Large sized incubator	100.00	
Other small items of apparatus.....	673.30	3,944.70
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<i>Books—</i>		
Technical books for library		121.95
<i>Supplies—</i>		
Cover glass and cotton batting	\$ 43.75	
Parchment and filter paper	20.00	
Rubber tubing, cork stoppers, etc.	25.00	
Gelatine, albumen, balsam, charcoal, etc.....	17.00	
Blue wax pencils	9.00	
Miscellaneous supplies	83.05	
Stains, acids and other chemicals.....	252.43	450.23
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PHYSICS.

Additional Instructional Assistance—

Three instructors at \$900 per year for each.....	5,400.00
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Equipment—

For Lecture Purposes:

General apparatus:

Frames, stands, etc. (can be made in College Carpenter Shop)	\$ 25.00
Projection lantern and accessories, includ- ing table with adjustable top, etc.....	325.00
Electric whirling table	45.00

ESTIMATES OF REQUIREMENTS

213

Two cylinder Geryk air pump 2" x 5".....	150.00	
Air pump accessories	50.00	595.00

Mechanics:

Whirling table accessories	\$ 25.00	
Apparatus for work in hydrostatics	50.00	
Barometer	5.00	
Working models of pumps	20.00	
Wave apparatus for projection lantern.....	20.00	
Set of cohesion frames	4.00	
1 three-foot iron wheel, mounted on stand...	25.00	149.00

Heat:

Clamp to show contraction of iron.....	\$ 3.00	
Pressure pump, 1000 atmospheres	150.00	
Auxiliary apparatus to liquify gases.....	50.00	
Other small apparatus	15.00	218.00

Sound:

Tuning forks, singing flames, set Chladni's plates, etc.		52.00
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Light:

Optical bench and accessories	\$ 600.00	
Kaleidoscope	10.00	
Set crossed prisims	20.00	
Miscellaneous apparatus for work in light...	55.00	685.00

Electricity and Magnetism:

Electrostatic apparatus, different shaped conductors, large electroscope, etc.	\$ 50.00	
3 Crook's tubes, various patterns	50.00	
Calladon's fountain	15.00	
Nernst glowers and ballasts	15.00	
Miscellaneous small pieces of apparatus.....	110.00	240.00

For Laboratory Purposes:

General:

Clamps, rods, ring stands, etc.	\$ 100.00	
Laboratory clock	60.00	
3 Telescopes	36.00	
Platinum	20.00	
Water still	25.00	
Miscellaneous small items	13.00	254.00

Mechanics:

4 Vernier calipers	\$ 26.00	
4 Micrometer calipers	26.00	
2 Sets weights	20.00	
2 Micrometer microscopes, mounted separately	65.00	
2 Jolly balances	50.00	
Miscellaneous small items	46.90	233.90

Heat:

3 Hypsometers	\$ 33.00	
1 Specific heat apparatus	11.00	44.00

Sound:

2 Large tuning forms with style	\$ 10.00	
5 Tuning forms on resonators	35.00	45.00

Light:

Standard amylacetate lamp	\$ 15.00	
3 Spectrometers at \$80.....	240.00	
4 Spectral tubes	8.00	
Mercury arc lamp	20.00	
Grating replica	8.00	291.00

Electricity and Magnetism:

Clark, and Cadmium standard cells.....	\$ 20.00	
Silver voltameter with platinum cup.....	30.00	
Electrodynamometer	57.00	
4 Telephone receivers	30.00	
Switchboard voltmeters and ammeters.....	44.00	
5 Wall rheostats	50.00	
Standard microfarad	140.00	
1 Adjustable microfarad	35.00	
Variable standard of self and mutual induction	160.00	
Wolff standard resistances	40.00	
2 Wolff resistance boxes	200.00	
1 Wolff wheatstone bridge, six decades	200.00	
1 Kelvin balance	240.00	
Miscellaneous small items	75.50	1,321.50

Repairs—

Making repairs in laboratory, providing better artificial lighting, electric wiring, shelving, etc	205.00
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<i>Books</i> and periodicals for Library	122.95
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Supplies—

Chemicals, glassware, glass tubing, rubber tubing, etc.	\$ 100.00	
Planes, drills, nails, screws, etc.	50.00	
Brass and iron rods for making instruments.	50.00	
Copper, brass, and piano wire	50.00	
Switches, lamp cords, sockets, etc.	50.00	
Thermometers	25.00	
Castings, for various special pieces of apparatus and machine work	100.00	
Odds and ends and running expenses, freight, etc.	500.00	
Miscellaneous small supplies	42.00	967.00

MATHEMATICS.

Additional Instructional Assistance—

Two instructors (one not employed until year 1910-1911)	\$2,800.00	
Student assistance	200.00	3,000.00

Equipment—

Blackboard compasses, etc.	\$ 10.50	
Miscellaneous equipment	40.00	50.50

Books—

Webster's Academic dictionaries for teachers.	\$ 9.00	
Mathematical dictionaries	15.00	
Other books for Mathematical library	100.00	124.00

ENGLISH.

Additional Instructional Assistance—

Four instructors at \$900 each per year.		7,200.00
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Equipment—

4 Book cases	\$ 60.00	
3 Dictionaries	45.00	
1 Wall map of Europe, 1 map of U. S., and 1 of Asia	8.50	113.50

Books—

English reference books	\$ 403.50	
Books and material for debates	200.00	603.50

MODERN LANGUAGES.

Additional Instructional Assistance—

Instructor for 2 years (part time only during first year)	1,500.00
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Books—

Reference books for departmental library	132.80
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Supplies—

Miscellaneous supplies, stationery, etc.	20.00
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HISTORY.

Books—

Reference books for library	2,000.00
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ART.

Additional Instructional Assistance—

One instructor	2,000.00
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Equipment—

Class studio furniture	\$ 320.00	
Lockers	100.00	
New casts	150.00	570.00

<i>Books for library</i>	200.00
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Supplies—

Stationery, etc.	25.00
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PHYSICAL EDUCATION.

Additional Instructional Assistance—

Instructor in Indoor Gymnastics	2,000.00
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Equipment—

For Gymnasium:

3 Horizontal bars @ \$80.....	\$ 240.00	
6 Climbing ropes @ \$8.....	48.00	
2 Vaulting horses @ \$120.....	240.00	
2 Vaulting bucks @ \$90.....	180.00	
1 Spring board	45.00	
1 Pole vaulting board	16.00	
1 Kick standard	12.00	
1 Set flying rings	14.00	
2 Parallel bars @ \$37.50.....	75.00	
2 Suspended parallel bars @ \$30.....	60.00	
4 Mats, 5 x 10' @ \$30.....	120.00	
100 pairs 1-pound dumbbells and hooks @ 75c....	75.00	
10 Medicine balls @ \$6	60.00	
600 Lockers @ \$3	1,800.00	2,985.00

For Physical Training for Women:

Anthropometric apparatus	\$ 125.00	
Office fixtures	100.00	
Girls' athletic field—basketball court	400.00	625.00

Supplies—

Office supplies, stenographic work, and small items of repairs	1,000.00
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MILITARY SCIENCE AND TACTICS.

Additional Assistance—

Retired non-commissioned officer to take care of ordnance, etc.	1,000.00
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Equipment—

Arm racks with canvas covers for 720 rifles.....	\$ 112.00	
3 Tables for battalion officers	27.00	
3 Tables for regimental officers	41.50	
40 Sabres for use of cadet officers	500.00	680.50

Supplies—

Stationery, printing, etc.	30.00
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LIBRARY.

Assistance—

Assistant Librarian	\$1,800.00	
Student assistance	300.00	2,100.00

Equipment --

6 Stacks @ \$40	\$ 240.00	
Blank catalogue cards	29.50	
Library of Congress printed cards.....	200.00	
Periodical record and guide cards.....	5.00	
Catalogue case (60 tray)	130.00	
Shelving for Reading Room	100.00	
Periodical racks	75.00	
Small cases, trays, pamphlet cases, book sup- ports, shelf label holders, etc.	37.50	
Periodical temporary binders	75.00	
Pamphlet covers	11.00	
Postal scales	5.40	
Miscellaneous	100.00	1,008.40

Books—

General books, exclusive of department estimates	\$1,000.00	
Current periodicals	800.00	
Binding of periodicals and bulletins	1,000.00	
General collection for Reading Room.....	500.00	
Back numbers of technical journals, etc.	500.00	
General binding	100.00	
Sociology, government, etc.	200.00	
History and biography	400.00	
Useful arts	200.00	
Science	200.00	
Travel and geography	200.00	
Art	100.00	5,200.00

Supplies—

Postage	\$ 100.00	
Miscellaneous supplies, ink, erasures, book varn- ish, typewriter ribbons, etc.	100.00	
Printing	50.00	
Book repair material	20.00	270.00

REGISTRAR'S OFFICE.

Assistance—

Clerical assistance for Registrar's office and for Attendance Committee	1,000.00
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Equipment—

Matriculation and other books	45.00
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Supplies—

Printing blanks for office	\$ 30.00	
Class roll books and paper	80.00	
Stationery, stamps, etc.	75.00	185.00

Mailing --

Mailing catalogues and other special circulars.....	1,500.00
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DEPARTMENTAL STENOGRAPHIC ASSISTANCE.

School of Agriculture—

Dean of School and heads of Agricultural Departments....	1,500.00
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School of Engineering and Mechanic Arts—

Dean of School and heads of all Engineering Departments	500.00
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School of Domestic Science and Art—

Dean of School and Domestic Science and Art faculty.....	250.00
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Extension Work—

Stenographic and other clerical assistance	1,400.00
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PRINTING PLANT.

Assistance—

Labor	800.00
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Equipment—

1 Miehle press with all necessary fixtures, (F. O. B. Corvallis)	\$2,739.00	
1 32-inch Oswego power paper cutter	411.50	
1 Perforation power wire stitcher, ¾-inch.....	300.00	3,450.50

Supplies—

Paper stock, ink, etc	6,000.00
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JANITORIAL.

Labor—

Regular and student labor	7,700.00
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Supplies—

Floor brushes, towelling, soap, toilet paper, pails, dust pans, etc.	\$1,270.60	
Oiling floors	600.00	1,870.60

CAMPUS.

Assistance—

Florist	\$1,800.00	
3 Laborers, including teamster	3,600.00	
Student labor (50 hours per week)	780.00	6,180.00

Equipment—

For Greenhouses:

Pots	\$ 200.00	
New plants	150.00	
Tools	170.00	570.00

For Campus:

Tools	\$ 120.00	
Cold frames	175.00	
Nursery stock	100.00	
Horse, dump cart, and harnesses.....	300.00	
Express wagon	150.00	
Lawn mower	15.00	
Hose	50.00	
Blacksmithing	110.00	
Miscellaneous equipment	250.00	1,100.00

Maintenance of new Greenhouses—

Coal	\$ 250.00	
Paint and putty	50.00	
Night firing	60.00	360.00

New Work on Campus—

Piping (2730 feet)	\$ 204.75	
Drainage	400.00	
Waldo Hall	1,500.00	

ESTIMATES OF REQUIREMENTS

221

Agricultural building	1,000.00	
Gravel	350.00	
Miscellaneous work on old campus	350.00	3,804.75

WALDO HALL.

Equipment—

Furniture for student rooms:

120 Dressers @ \$12	\$1,440.00	
145 Rocking chairs @ \$2.75	398.65	
120 Tables @ \$2.75	329.90	2,168.55

Furniture for Dining Room:

200 Chairs @ \$2.00.....	\$ 400.00	
6 Tables at \$4.00.....	24.00	424.00

Furniture for Parlors:

4 Chairs @ \$15.....	\$ 60.00	
3 Rugs @ \$50.....	150.00	210.00

Kitchen:

1 Pantry sink	\$ 25.00	
1 Milk cooler	50.00	
7 Window shades	5.25	
Miscellaneous utensils	100.00	
Silver and China	500.00	680.25

Linen:

2 Doz. table clothes @ \$4.50.....	\$ 180.00	
Napkins and towels	31.00	
Sheets, pillow cases, and spreads	37.80	
Miscellaneous linen	56.50	305.30

Miscellaneous:

Bookcases	\$ 15.00	
Books, pictures, and rugs.....	250.00	265.00

Improvements—

Improvements in Dining room	25.00
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HEATING.

(From Professor Covell's Report)

Main Heating Plant:

Fuel	\$4,074.00	
Labor	810.00	4,884.00

Waldo Hall:

Fuel	\$ 900.00	
Labor	180.00	1,080.00

Shepard Hall:

Fuel	\$ 390.00	
Labor	180.00	570.00

Agronomy Building:

Fuel	\$ 630.00	
Labor	180.00	810.00

Armory for hot water:

Fuel	\$ 75.00	
Labor	100.00	175.00

Pharmacy Building:

Fuel	\$ 187.00	
Labor	90.00	277.00

Cauthorn Hall:

Fuel	\$ 500.00	
Labor	180.00	680.00

Total for one year\$8,476.00

Less amount for Waldo Hall, Cauthorn Hall,
and Shepard Hall 2,330.00

Net amount required for one year\$6,146.00

Total amount for two years \$12,292.00

LIGHT AND POWER.

(From Professor Covell's Report)

Summary of light and power for two years:

Current for power\$3,110.00

ESTIMATES OF REQUIREMENTS

223

Current for lighting	1,100.00	
Lamp renewals and repairs	200.00	4,410.00

GENERAL REPAIRS.

(From Mr. Jackson's Report)

Administration Building—

Repairing cement facing on outside of building..\$	10.00	
Five new window panes	10.00	
New floor in hallway, north end building, first floor	25.00	
New floor in two rooms, north end of building, first floor	60.00	
North end of building is spreading apart and should be tied with large bolts	100.00	
Patching steps and floor on second floor.....	50.00	
Painting woodwork and tinting walls in two south rooms, second floor	25.00	
Patching stairways and floor, third floor.....	37.00	
Painting woodwork and tinting walls, ceilings in hallways, and five rooms, third floor.....	70.00	
Painting tin roof	80.00	
New cement walk at south entrance to building..	25.00	492.00

Agricultural Hall—

Repairing north and south ends of building where floors are settling	\$ 50.00	
Painting and repairing roof.....	300.00	
Painting windows and outside doors.....	80.00	
Patching stairways and halls, second floor	15.00	
One new pane glass for exhibit case in Museum	10.00	
Painting woodwork, plastering, and tinting.....	20.00	
Repairing four windows	10.00	490.00

Mechanical Hall—

Cement repairing of outside walls and front steps	\$ 8.00	
Two screen windows in wall	4.00	
Steps and platform for back entrance.....	30.00	
Two new front doors	25.00	
Eight new window glasses	15.00	
Repairing plaster throughout building.....	50.00	

Painting and repairing roof	250.00	
Painting windows and outside doors	50.00	
Remodelling and improving toilets	750.00	
New floors in hallway, first floor	45.00	
Patching floor in Engineering laboratory	10.00	
New floor at head of stairway, second floor.....	18.00	
Painting ceiling Engineering laboratory.....	18.00	
Painting ceiling and one wall of old printing office	14.00	
One column in Electrical Engineering laboratory	10.00	
One new column in Physics lecture room.....	10.00	
One new door in Engineering laboratory	7.00	
Tinting hallways on first and second floors and along stairways	20.00	1,334.00

Armory Building—

Repairing stone walls where cement has been taken out	\$ 3.00	
Two new outside basement doors.....	25.00	
Cement floor in hallway in basement entrance..	15.00	
Four new inside doors	28.00	
New floors in basement	200.00	
Second floor new	400.00	
Replacing old toilets in basement.....	500.00	
Shower bath room enameled	20.00	
Repairing two stairways from second floor to gallery	25.00	
Front steps repaired	15.00	
Roof repaired and entire building given two coats of paint	600.00	
New water gutters	125.00	
Five window panes	5.00	2,203.00

Mining Building—

Painting entire building and repairing front basement door \$ 125.00

Power and Heating Plant—

Painting roof, doors, and windows of building..\$	25.00	
Renewal of steam and return pipes in first sec- tion of conduit and return pipes in second conduit	525.00	
Repairs to boilers (grate bars, and arch liners)	120.00	
Miscellaneous plumbing repairs	100.00	770.00

ESTIMATES OF REQUIREMENTS

225

Mining Laboratory—

Repairing roof	\$ 35.00	
Cement facing on all outside walls needs new coat of cement (rain seeps through walls).....	110.00	
Porch roof over front door to keep rain from beating in under door	20.00	
One new window cut through wall into furnace room	25.00	190.00

Pharmacy Building—

Entire building given two coats of paint	\$ 275.00	
Papering, tinting, and painting interior of building (patch work)	20.00	295.00

Cauthorn Hall—

Patching floors	\$ 45.00	
New walks in rear of building repaired.....	25.00	
Roof over back kitchen porch	25.00	
Basement doors and windows	30.00	
30 rooms to be papered and tinted	150.00	
New roof on cellar—shingled and painted.....	60.00	
Repairs to heating plant (old plant practically worn out)	500.00	
Rewiring entire building:		
Wiring, switches (for each floor and room), fuse box, flooring replaced, plaster replaced and painted.....	\$ 540.00	
Ceiling rosettes, cord, socket, and lamps (for all rooms)	65.00	
Four fixtures for dining room (and two for reception room).....	60.00	665.00
		2,165.00

Mechanic Arts Building—

Refitting windows and rehangng doors	30.00
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Waldo Hall—

Painting room and fire escapes.....	\$ 400.00	
Slat window shades taken out and new cloth shades put in their place	400.00	
Floors finished	350.00	
Refitting windows and rehangng doors	30.00	
Repairs on water and drain pipes.....	200.00	1,380.00

Barns—

Painting old barn and hog house.....	\$ 300.00	
Carpenter repair work around old barn.....	200.00	
Changing cupolas on old barn to agree with those on new barn	55.00	555.00

Horticultural Drying House—

New front porch	\$ 20.00	
Painting entire building	75.00	
Chimney repaired	8.00	103.00

GENERAL IMPROVEMENTS.

Cauthorn Hall Sewer—

890 feet 8" T. C. pipe at 24c.....	\$ 213.00	
Freight on one car from Portland	33.80	
Drayage on pipe, cement, etc.	10.00	
Excavating and backfilling 354 yds. at 30c.....	106.20	
Flush tank complete	79.50	
Three manholes, complete	80.00	
Labor laying pipe	18.00	
Cement and sand not included in above.....	5.25	
Superintendence (12 days at \$3.00 per day).....	36.00	
Incidentals	40.00	622.35

Cost of connecting present plumbing to new sewer..... 50.00

Campus Drain Pipe—

Laying large drain pipe across campus and filling present ditch:		
770 feet 24" pipe (@ \$2.50 less 30 per cent) ..	\$1,347.50	
Cement mixed	53.90	
Freight at \$2.80 per ton	129.40	
Drayage at \$1.00 per ton	46.00	
Cost of excavating and laying	205.00	
Cost of opening up the ditch below campus in order to get good out-fall.....	100.00	
Incidentals	100.00	1,981.80

Mechanic Arts Building—

New porch extending in front of both doors en- tering woodwork machine room	\$ 20.00
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ESTIMATES OF REQUIREMENTS

227

New over-head floor in woodwork class room, or in old carpenter room, in order to get more room for lumber supply	40.00	
Wire screens for 12 windows in front of lathes and machines in woodwork department.....	30.00	90.00

Barns—

Completing new barn ceiling, interior hard oiling, cement floor in root cellar, and partition in seed room.....	1,800.00
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Farm—

New fence for entire farm.....	2,000.00
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Fire Protection—

3 Hose carts @ \$120.....	\$ 360.00	
1500 feet Keystone hose @ 90c.....	1,350.00	
6 Underwriter's play nozzles @ \$9.....	54.00	
100 Galvanized iron fire buckets @ \$1.....	100.00	
Ladders for principal buildings	136.00	
10 Hydrants @ \$45	450.00	
6 Split T's (6") @ \$10.....	60.00	
3 L's (4") @ \$2.25	6.75	
4 T's (4") @ \$3.50	14.00	
1725 feet wood pipe (4").....	431.25	
800 feet wood pipe (6").....	240.00	
Labor, superintendence, drayage, etc.....	250.00	3,451.00

EXPERIMENT STATION.

Additional Assistance—

Assistant in Dairy Husbandry to co-operate with dairymen of the State in an investigation of milk solids, testing and the manufacture of special classes of cheese, and expenses of op- erating dairy	\$2,000.00	
Assistant in Agricultural Chemistry	1,500.00	
Field assistant for plant breeding in department of Agronomy	1,500.00	
Field assistant for co-operative work in the de- partments of Horticulture and Entomology....	1,500.00	6,500.00

Land—

100 acres additional farm land	\$20,000.00	
Land for Horticultural department.....	7,000.00	27,000.00

Supplies—

Chemicals and other supplies for work in Agricultural Chemistry		500.00
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SUMMARY.

Maintenance—(Two Years)—

Additional professors, instructors, and assistants, including Industrial Pedagogy, Veterinary Science, Irrigation and Drainage, and Highway Engineering		\$95,550.00
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Repairs:

Departmental	\$ 3,564.00	
General	10,132.00	13,696.00

Supplies:

Departmental (The student laboratory and shop fees cover the cost of departmental supplies)	23,848.00	
Miscellaneous (including stock for printing plant)		8,055.00
Heat (Less Cauthorn, Waldo, and Shepard Halls)	\$12,292.00	
Light and Power	4,410.00	
Campus (Including labor and supplies for maintenance of greenhouses)	6,540.00	
Janitorial work (excluding salary head janitor)	7,700.00	
Furniture (Including recitation chairs, etc.)	2,000.00	
College Exhibits at state and other agricultural fairs	1,685.00	
Nightwatchman	1,200.00	
Printing and Advertising	4,800.00	
Telephone, telegraph, water tax	3,200.00	
Assistance in Registrar's Office, Business Office, and postage and stationery; traveling expenses (departmental and general)	6,430.00	
Contingent	5,000.00	55,257.00

SALARY LIST

229

Books:

Library	12,451.00
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Improvements—

General	\$ 9,995.00	
Miscellaneous	3,829.00	13,824.00

Equipment—

Departmental	\$80,614.00	
Miscellaneous	9,208.00	89,822.00

For Experiment Station summary, see preceding page.

SALARY LISTS.

Below are given lists of employees of the Oregon Agricultural College, with salaries, for the years 1906-1907, 1907-1908, and 1908-1909, showing the division of salaries between college and station funds. These totals, in some few cases, are more than amount actually received—due to resignation or the fact that some instructors may have been employed for only ten months of the year.

OFFICERS OF ADMINISTRATION AND INSTRUCTION
DURING YEAR 1906-1907.

<i>Name and Official Position.</i>	<i>Salary.</i>		<i>Total.</i>
	<i>Station.</i>	<i>College.</i>	
THOMAS M. GATCH, A. M., Ph. D., President		\$3,000	\$3,000
JAMES WITHYCOMBE, M. Agr., Director of Experiment Station, Professor of Agriculture	\$ 300	1,700	2,000
FREDERICK BERCHTOLD, A. M., Professor of English Literature.....		1,600	1,600
MARGARET COMSTOCK SNELL, M. D., Professor of Household Science.....		1,200	1,200
GRANT ADELBERT COVELL, M. E., Professor of Mechanics and Mechan- ical Engineering		1,600	1,600

JOHN B. HORNER, A. M., Litt. D., Registrar, Professor of History and Latin.....	1,600	1,600
GORDON VERNON SKELTON, C. E., Professor of Mathematics, Civil and Mining Engineering	1,600	1,600
ARTHUR BURTON CORDLEY, M. S., Professor of Zoology and Entomology	1,600	1,600
EDWARD RALPH LAKE, M. S., Professor of Botany and Forestry....	540	1,060
ABRAHAM LINCOLN KNISLEY, M. S., Professor of Chemistry	1,700	1,700
HELEN VIRGINIA CRAWFORD, B. S., Professor of Elocution	1,000	1,000
GEORGE COOTE, Prof. of Floriculture and Gardening	300	780
JOHN FULTON, B. Agr., B. S., Professor of Mineralogy and Geology	1,400	1,400
THOMAS HENRY CRAWFORD, A. M., Professor of Commerce	600	900
CLAUDE ISAAC LEWIS, B. S., Professor of Horticulture	1,600	1,600
IDA BURNETT CALLAHAN, B. S., Dean of Women and Assistant Pro- fessor of English	1,000	1,000
FRED LEROY KENT, B. Agr., Associate Professor of Agriculture and Dairying	1,040	360
CHARLES LESLIE JOHNSON, B. S., Assistant Professor of Mathematics	1,020	1,020
EMILE FRANCIS PERNOT, M. S., Professor of Bacteriology	1,360	240
CLARENCE MELVILLE MCKELLIPS, Ph. C., Assistant Professor of Pharmacy	1,400	1,400
FRANK EDWARDS, B. M. E., M. S., Commandant, Instructor in Chemistry	300	900
WILLIAM THOMAS SHAW, B. Agr., M. S., Instructor in Biology	1,200	1,200
JOHN COLBURN BRIDWELL, B. S., Instructor in Biology	1,200	1,200
MARK CLYDE PHILLIPS, B. M. E., Instructor in Mechanical Drawing and Ironwork	1,020	1,020
FARLEY D. McLOUTH, B. S., Director of Art Department.....	900	900
HELEN LUCILE HOLGATE, B. S., Instructor in Stenography and Type.	540	540
MARK DOW McALLISTER, B. S., Instructor in Woodwork	900	900

SALARY LIST

231

CHARLES EDWARD BRADLEY, M. S., Instructor in Chemistry	1,080	.....	1,080
GERARD TAILLANDIER, Director of Music, Instructor of German .....	.....	540	540
NICHOLAS TARTAR, B. S., Instructor of Mathematics .....	.....	780	780
MARY E. SUTHERLAND, B. S., Instructor in Dressmaking .....	.....	360	360
WILLIAM O. TRINE, Physical Director .....	.....	1,020	1,020
HARRY BEARD, B. S., Band Master, Assistant in English .....	.....	780	780
LOREN BURTON BALDWIN, A. M., Instructor in English .....	.....	600	600
EARLE VINCENT HAWLEY, B. S., Assistant in Mechanical and Electri- cal Engineering .....	.....	840	840
GRACE GATCH, A. B., Assistant in Latin and History.....	.....	600	600
JUANITA ROSENDORF, B. S., Assistant in Typewriting and Ste- nography .....	.....	540	540
RICHARD JEFFREY NICHOLS, B. S., Librarian .....	.....	720	720
EDNA SHEEHY, Instructor in Vocal Music (Depends upon fees received from students)	.....	.....	.....
WILLIAM MCCAULEY PORTER, Instructor in Blacksmithing.....	.....	660	660
FRANK MCREYNOLDS, Instructor in Stringed Instruments.. (Depends upon fees received from students) .....	.....	.....	.....
BERT GILBERT HARTSON, Assistant in Physical Education.....	.....	1,200	1,200
GEORGE B. KEADY, Printer	360	840	1,200
ARTHUR W. KEADY, Assistant Printer	300	480	780
WALTER JAMES KENT, Foreman Farm	600	.....	600
JOHN ANDERSON SPANGLER, Foreman Heating and Power Plant..	60	600	660
ELLSWORTH ERWIN, Head Janitor .....	.....	1,000	1,000
ROBERT CLEMENT WILLS, Carpenter .....	.....	900	900
WILLIAM WICKS, M. S., Assistant in Horticulture.....	720	.....	720

ARTHUR GEORGE BOUQUET, B. S., Assistant in Floriculture	540	.....	540
	\$13,000	\$30,580	\$43,580

OFFICERS OF ADMINISTRATION AND INSTRUCTION
DURING YEAR 1907-1908.

<i>Name and Official Position.</i>	<i>Salary.</i>		<i>Total.</i>
	<i>Station.</i>	<i>College.</i>	
WILLIAM JASPER KERR, D. Sc., President		\$5,000	\$5,000
THOMAS MILTON GATCH, A. M., Ph. D., Prof. of Political and Mental Science		1,700	1,700
JAMES WITHYCOMBE, M. Agr., Director of Experiment Station, Professor of Animal Husbandry.....	\$1,700	300	2,000
FREDERICK BERCHTOLD, A. M., Professor of English Language and Literature		1,600	1,600
MARGARET COMSTOCK SNELL, M. D., Professor of Household Science and Hygiene		1,200	1,200
GRANT ADELBERT COVELL, M. E., Professor of Mechanical Engineering		1,600	1,600
JOHN B. HORNER, A. M., Litt. D., Registrar, Professor of History and Latin.....		1,600	1,600
GORDON VERNON SKELTON, C. E., Professor of Civil Engineering.....		1,600	1,600
ARTHUR BURTON CORDLEY, M. S., Prof. of Zoology and Entomology....	1,500	200	1,700
EDWARD RALPH LAKE, M. S., Professor of Botany and Forestry....		1,600	1,600
ABRAHAM LINCOLN KNISLEY, M. S., Professor of Agricultural Chemistry	1,800	.....	1,800
HELEN VIRGINIA CRAWFORD, B. S., Professor of Elocution		1,000	1,000
GEORGE COOTE, Prof. of Floriculture and Gardening..	200	800	1,000
JOHN FULTON, B. Agr., B. S., Professor of Chemistry		1,600	1,600
THOMAS HENRY CRAWFORD, A. M., Professor of Commerce, Clerk and Purchasing Agent.....	600	900	1,500
CLAUDE ISAAC LEWIS, B. S., Professor of Horticulture	1,275	425	1,700

SALARY LIST

233

IDA BURNETT CALLAHAN, B. S., Dean of Women and Assistant Pro- fessor of English		1,000	1,000
FRED LEROY KENT, B. Agr., Professor of Dairy Husbandry.....	1,100	300	1,400
CHARLES LESLIE JOHNSON, B. S., Professor of Mathematics		1,200	1,200
EMILE FRANCIS PERNOT, M. S., Professor of Bacteriology	1,500	200	1,700
CLARENCE MELVILLE MCKELLIPS, Ph. C., Professor of Pharmacy		1,400	1,400
U. G. MCALEXANDER, Capt., 13th Inf., U. S. A., Commandant, Prof. Military Science and Tactics..		600	600
JAMES DRYDEN, Professor of Poultry Husbandry.....	600	1,200	1,800
THOMAS MOONEY GARDNER, M. M. E., Professor of Electrical Engineering..		1,800	1,800
HENRY MARTIN PARKS, B. S., E. M., Professor of Mining Engineering.....		2,000	2,000
HENRY DESBOROUGH SCUDDER, B. S., Professor of Agronomy	600	900	1,500
GERARD TAILLANDIER, Professor of Modern Languages, Director of School of Music		840	840
JOHN COLBURN BRIDWELL, B. S., Instructor in Zoology		1,200	1,200
MARK CLYDE PHILLIPS, B. M. E., Instructor in Mechanical Drawing and Ironwork		1,200	1,200
FARLEY D. McLOUTH, B. S., Director of Art Department.....		900	900
HELEN LUCILE HOLGATE, B. S., Instructor in Stenography and Type- writing	450	225	675
MARK DOW McALLISTER, B. S., Instructor in Woodwork		900	900
CHARLES EDWARD BRADLEY, M. S., Instructor in Chemistry	1,080		1,080
NICHOLAS TARTAR, B. S., Instructor of Mathematics		900	900
Mary ELIZABETH SUTHERLAND, B. S., Instructor in Dressmaking		480	480
HARRY BEARD, B. S., Instructor in Mathematics		900	900
LOREN BURTON BALDWIN, A. M., Instructor in English		900	900
WILLIAM AUTHUR JENSEN, Secretary to the President		1,200	1,200

CHARLES ARTHUR COLE, M. S., Instructor in Horticulture.....	900	100	1,000
GRACE GATCH, A. B., Instructor in History and Latin.....		600	600
ROY E. HEATER, Instructor in Physical Culture.....		900	900
HERMAN V. TARTAR, B. S., Instructor in Chemistry		900	900
ELMER POLIC JACKSON, B. S., Instructor in Woodwork.....		1,200	1,200
EARL VINCENT HAWLEY, B. S., Instructor in Physics		700	700
JUANITA ROSENDORF, B. S., Assistant Registrar		525	525
RICHARD JEFFREY NICHOLS, B. S., Librarian	200	400	600
WILLIAM MCCAULEY PORTER, Instructor in Blacksmithing		550	550
E. L. ADAMS, Instructor in English		350	350
ARTHUR GEORGE BOUQUET, B. S., Assistant in Horticulture		540	540
	<u>\$12,605</u>	<u>\$49,115</u>	<u>\$61,720</u>

OTHER OFFICERS.

GEORGE B. KEADY, Foreman Printing Plant	\$ 480	\$ 720	\$1,200
ARTHUR W. KEADY, Assistant Printer	360	420	780
JOHN ANDERSON SPANGLER, Foreman Heating and Power Plant..	60	640	700
ELLSWORTH ERWIN, Head Janitor	420	580	1,000
A. APPLEWHITE, Farm Foreman	720		720
	<u>\$2,040</u>	<u>\$2,360</u>	<u>\$4,400</u>

OFFICERS OF ADMINISTRATION AND INSTRUCTION
DURING YEAR 1908-1909.

Name and Official Position.	Salary.		Total.
	Station.	College.	
WILLIAM JASPER KERR, D. Sc., President		\$5,000	\$5,000
JAMES WITHYCOMBE, M. Agr., Director of Experiment Station, Professor of Animal Husbandry.....	\$1,300	700	2,000

SALARY LIST

235

ARTHUR BURTON CORDLEY, M. S., Dean School of Agriculture, Prof. of Zoology and Entomology.....	800	1,000	1,800
GRANT ADELBERT COVELL, M. E., Dean School of Engineering and Mechanic Arts, Professor of Mechanical Engineering		1,800	1,800
JULIET GREER, A. B., Dean School of Domestic Science and Art, Professor of Domestic Science.....		2,000	2,000
JOHN ANDREW BEXELL, A. M., Dean School of Commerce, Professor of Business Administration, Financial Secretary		2,000	2,000
FREDERICK BERCHTOLD, A. M., Professor of English Language and Literature		1,600	1,600
JOHN B. HORNER, A. M., Litt. D., Prof. of History and Political Science, Registrar		1,600	1,600
GORDON VERNON SKELTON, C. E., Professor of Civil Engineering		1,700	1,700
EDWARD RALPH LAKE, M. S., Professor of Forestry and Botany....		1,700	1,700
GEORGE COOTE, Professor of Floriculture and Gar- dening (On leave of absence).....			
JOHN FULTON, M. S., Professor of General and Analytical Chemistry		1,700	1,700
THOMAS HENRY CRAWFORD, A. M., Professor of Commercial Law.....		1,500	1,500
CLAUDE ISAAC LEWIS, M. S. A., Professor of Horticulture.....	1,100	700	1,800
FRED LEROY KENT, B. Agr., Professor of Dairy Husbandry.....	1,000	400	1,400
CHARLES LESLIE JOHNSON, B. S., Professor of Mathematics.....		1,500	1,500
EMILE FRANCIS PERNOT, M. S., Professor of Bacteriology	1,400	300	1,700
CLARENCE MELVILLE MCKELLIPS, Ph. C., Professor of Pharmacy		1,500	1,500
GERARD TAILLANDIER, Professor of Modern Languages.....		1,600	1,600
U. G. MCALEXANDER, Capt., 13th Inf., U. S. A., Commandant, Prof. Military Science and Tactics....		900	900
JAMES DRYDEN, Professor of Poultry Husbandry.....	1,000	800	1,800

HENRY DESBOROUGH SCUDDER, B. S., Professor of Agronomy	850	850	1,700
HENRY MARTIN PARKS, B. S., E. M., Professor of Mining Engineering.....		2,000	2,000
CHARLES EDWARD BRADLEY, M. S., Professor of Agricultural Chemistry	1,500		1,500
EMMETT DUNN ANGELL, Director of the Gymnasium, Professor of Physical Education.....		1,800	1,800
WILLIAM FREDERICK GASKINS, B. S., Professor of Music (Depends on fees received from students for salary)			
WILLIAM ARTHUR JENSEN, Recorder of the Faculties, Secretary of the President.....		1,400	1,400
IDA BURNETT CALLAHAN, B. S., Assistant Professor of English Lan- guage and Literature		1,100	1,100
FARLEY D. MCLOUTH, B. S., Assistant Professor of Art.....		1,200	1,200
MARK CLYDE PHILLIPS, B. M. E., Assistant Professor of Mechanical Engineering		1,350	1,350
IDA ANGELINE KIDDER, A. B., Librarian	200	800	1,000
NICHOLAS TARTAR, B. S., Instructor of Mathematics		1,000	1,000
JOHN COLBURN BRIDWELL, B. S., Instructor in Zoology and Entomology	300	900	1,200
HARRY L. BEARD, B. S., Director of Cadet Band, Instructor in Mathematics		1,000	1,000
LOREN BURTON BALDWIN, A. M., Instructor in English		1,000	1,000
EARL VINCENT HAWLEY, B. S., Instructor in Electrical Engineering		800	800
GRACE GATCH, A. B., Instructor in History and Latin.....		800	800
WILLIAM MCCAULEY PORTER, Instructor in Forging		720	720
CHARLES ARTHUR COLE, M. S., Instructor in Horticulture	600	400	1,000
HERMAN V. TARTAR, B. S., Instructor in Chemistry		1,000	1,000
ELMER POLIC JACKSON, B. S., Instructor in Carpentry		1,350	1,350
ROY E. HEATER, Instructor in Physical Education.....		900	900
MARION SUDDUM VAN LIEW, Instructor in Domestic Science.....		1,000	1,000

SALARY LIST

237

ARIEL M. EWING, Instructor in Domestic Art.....	1,000	1,000
HELEN HYDE TOBIN, Instructor in Domestic Art.....	1,200	1,200
ERWIN L. POTTER, B. S., Instructor in Animal Husbandry.....	400 600	1,000
C. L. KNOFF, M. E., Instructor in Mechanical Engineering	1,000	1,000
RALPH D. HETZEL, A. B., LL. B., Instructor in Public Speaking and Debating	1,200	1,200
WINIFRED MAUDE WILLIAMS, B. Ph., Instructor in English and Physical Culture for Women	1,100	1,100
EDWARD B. BEATY, B. S., Instructor in Mathematics	900	900
WILLIBALD WENIGER, Ph. D., Instructor in Physics	1,200	1,200
SIMON N. CACERES, C. E., Instructor in Spanish and Mathematics	1,000	1,000
H. LEW MATHRE, Instructor in Commerce	900	900
ARTHUR L. PECK, B. S., Instructor in Floriculture and Land- scape Gardening	1,400	1,400
GEORGE ROBERT HYSLOP, B. Sc., Instructor in Agronomy	500 700	1,200
EARL PAUL HARDING, B. S., Instructor in Pharmacy and Chem- istry	800	800
GENEVIEVE BAUM-GASKINS, Instructor in Music (Depends on fees for salary)		
ADMA GREEN, Instructor in Art.....	800	800
EZRA S. DIXON, Instructor in English	550	550
WILLIAM R. BOONE, Instructor in Piano (Depends upon fees received from students).....		
NETTIE M. FLINN, Instructor in Mandolin, Piano and Violin (Depends upon fees received from students).....		
ARTHUR GEORGE BOUQUET, B. S., Assistant in Horticulture (On leave of absence)		
RALPH WILMER ALLEN, B. S. Assistant in Horticulture.....	720	720

CLARENCE CORNELIUS VINCENT, B. S., Assistant in Horticulture.....	720	.....	720
FRED CLARK EWING, B. S., Assistant in Entomology	720	.....	720
CLAUDE CLIFTON CATE, B. S., Assistant in Plant Pathology.....	720	.....	720
OTTO GERALD SIMPSON, B. S., Assistant in Dairy Husbandry.....	.....	400	400
FRED L. GRIFFIN, B. S., Assistant in Zoology and Entomology	300	300	600
LAURA HILL, B. S., Assistant in Zoology and Entomology	200	280	480
SAMUEL HERMAN GRAF, B. S., Assistant in Mechanical Engineering	.....	300	300
WILFORD W. GARDENER, C. E., Assistant in Civil Engineering.....	.....	300	300
HERBERT EDWARD COOKE, B. E., Assistant in Mining Engineering.....	.....	600	600
BENTON KIRKWOOD BRODIE, B. S., Assistant in Chemistry .....	.....	250	250
HELEN MARGARET GILKEY, B. S., Assistant in Botany .....	.....	200	200
GLEN DEHAVEN, B. S., Assistant in Bacteriology	300	.....	300
FRANCES HUSTON, Assistant in Physical Education for Women .....	.....	150	150
	\$14,630	\$68,500	\$83,130

OTHER OFFICERS AND EMPLOYEES.

A. APPLEWHITE, Foreman of College Farm.....	\$ 720.00	.....	\$ 720.00
GEORGE B. KEADY, Foreman of Printing Plant .....	.....	\$1,200.00	1,200.00
HELEN LUCILE HOLGATE, B. S., Station Clerk and Stenographer.....	825.00	.....	825.00
JUANITA ROSENDORF, B. S., Assistant Registrar .....	.....	757.50	757.50
JOHN ANDERSON SPANGLER, Foreman Heating and Power Plant...	60.00	740.00	800.00
ELLSWORTH ERWIN, Head Janitor .....	.....	1,000.00	1,000.00
W. HORACE KERR, Clerk Business Office	300.00	600.00	900.00
ARTHUR W. KEADY, Assistant Printer	400.00	600.00	1,000.00
	\$2,305.00	\$4,897.50	\$7,202.50

TREASURER'S REPORT, 1907.

Corvallis, Oregon, July 17, 1907.

To the Honorable the Board of Regents,

Oregon Agricultural College.

Gentlemen:—Herewith I submit my report for the year ended June 30, 1907. The vouchers and other evidences of payment are on file in the office of the Clerk and Purchasing Agent.

Very respectfully,

B. F. IRVINE,

Treasurer.

BALANCES ON HAND JULY 1, 1906.

State Interest	\$ 464.86	
Improvement	479.28	
Local Station	399.89	
Laboratory	1,955.64	
Special	1,346.84	\$ 4,646.51

INCOME FOR THE YEAR.

Station	\$ 15,000.00	
College	25,000.00	
State Interest	11,299.76	
Improvement	854.84	
Local Station	1,939.68	
Laboratory	3,917.50	
Special	25,000.00	
Adams	7,000.00	\$ 90,011.78
Total to be accounted for		\$ 94,658.29

DISBURSEMENTS.

Station	\$ 15,000.00	
College	25,000.00	
State Interest	11,764.62	
Improvement	1,320.36	
Local Station	2,314.19	
Laboratory	3,601.22	
Special	23,338.65	
Adams	7,000.00	\$ 89,338.95
Balance		\$ 5,319.34

BALANCE BY FUNDS.

Improvement	\$ 13.76	
Local Station	25.47	
Laboratory	2,271.92	
Special	3,008.19	\$ 5,319.34

MISCELLANEOUS RECEIPTS (Included above).

Source.	Amount.	Local Station.	Impov.
Agriculture	\$ 1,153.20	\$ 1,153.20	
Dairy	776.48	776.48	
Horticulture	10.00	10.00	
Miscellaneous	854.84		854.84
Totals	\$ 2,794.52	\$ 1,939.68	\$ 854.84

1906-1907.

DISBURSEMENTS BY SALARIES-INCIDENTALS AND TOTALS.

<i>Item.</i>	<i>Salaries.</i>	<i>Incidentals.</i>	<i>Totals.</i>
Printing	\$ 1,879.80	\$ 1,954.55	\$ 3,834.35
Agriculture	3,320.05	4,327.97	7,648.02
Horticulture—Coote	1,080.00	3,128.83	4,208.83
Botany	1,600.00	467.86	2,067.86
Chemistry	3,620.20	4,133.11	7,753.31
Bacteriology	1,600.00	77.78	1,677.78
Entomology	2,595.20	2,240.03	4,835.23
Mechanics	5,032.50	1,711.46	6,743.96
Household economy	1,560.00	116.87	1,676.87
Pharmacy	1,320.05	458.90	1,778.95
Library	600.00	706.91	1,306.91
Horticulture—Lewis	1,600.00	1,782.25	3,382.25
Mining	1,985.00	257.73	2,242.73
Salaries outside departments....	18,924.85	.....	18,924.85
Sanitary .....	.....	211.00	211.00
Furniture .....	.....	1,587.50	1,587.50
Traveling expenses .....	.....	1,349.89	1,349.89
Advertising .....	.....	99.33	99.33
Fuel .....	.....	2,535.70	2,535.70
Postage .....	.....	441.10	441.10
Freight .....	.....	780.69	780.69
Telephones and telegrams .....	.....	268.48	268.48
Scientific apparatus .....	.....	1,422.04	1,422.04
Tools and machinery .....	.....	1,461.47	1,461.47
Building, general repairs .....	.....	1,410.76	1,410.76
Building, repairs Station .....	.....	97.85	97.85
Miscellaneous labor .....	.....	696.40	696.40
Miscellaneous supplies .....	.....	613.30	613.30
Extra janitors .....	.....	1,030.23	1,030.23
J. A. Spangler .....	.....	655.00	655.00
R. C. Wills .....	.....	900.00	900.00
E. P. Erwin .....	.....	879.90	879.90
Military .....	.....	299.12	299.12
Vacation tour, Cordley and Shaw .....	.....	136.70	136.70
Cauthorn Hall .....	.....	441.78	441.78
Miscellaneous and current .....	.....	2,825.35	2,825.35
Alpha Hall .....	.....	36.75	36.75
Livestock .....	.....	752.20	752.20
Building, new, Adams .....	.....	324.51	324.51
Totals	\$ 46,717.65	\$ 42,621.30	\$ 89,338.95

REPORT OF FINANCE COMMITTEE.

Corvallis, Oregon, July 17, 1907.

To the Honorable, the Board of Regents of the
Oregon Agricultural College.

Gentlemen:—We, your Finance Committee, would respectfully report that we have examined the books and vouchers in the office of Clerk and Purchasing Agent of the College and Station and find the same well kept, neat and correct.

We find that the balances on hand July 1, 1906, to be accounted for by the Treasurer were as follows:

State Interest	\$ 464.86	
Improvement Fund	479.28	
Local Station Fund	399.89	
Laboratory Fund	1,955.64	
Special Fund	1,346.84	\$ 4,646.51

TREASURER'S REPORT

241

We find the revenue for the year to have been:

Station—Hatch Act	\$ 15,000.00		
Adams Act	7,000.00		\$ 22,000.00
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College—Morrill Act	\$ 25,000.00		
State Interest	11,299.76		
Improvement Fund	854.84		
Local Station	1,939.68		
Laboratory	3,917.50		
Special	25,000.00	\$ 68,011.78	\$ 68,011.78
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Total Amt. to be acctd. for			\$ 94,658.29

We find the disbursements to have been:

Station—Hatch	\$ 15,000.00		
Adams Act	7,000.00	\$ 22,000.00	
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College—Morrill Act	\$ 25,000.00		
State Interest Fund	11,764.62		
Improvement Fund	1,320.36		
Local Station Fund	2,314.10		
Laboratory Fund	3,601.22		
Special Fund—1901	23,338.65	\$ 67,338.95	\$ 89,338.95
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Balance on hand			\$ 5,319.34

BALANCE BY FUNDS.

Improvement Fund	\$ 13.76		
Local Station Fund	25.47		
Laboratory Fund	2,271.92		
Special Fund—1901	3,608.19		\$ 5,319.34
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Finance Report.

We have examined the report of the Treasurer of the Board for the year ended June 30, 1907, and find it correct as to the amount of money accounted for, namely, \$94,658.29.

There is nothing in the reports either of the Treasurer of the Board or the Clerk of the College to disclose the amount that has been received or expended of the Institute Fund or the Building Fund.

We have checked up the drafts and receipted bills on file and find them correct as set forth in the report of the Clerk and Treasurer except the following:—No. 143, G. E. Stechert & Co., \$14.16; No. 131, S. A. Brown, \$8.25; No. 544, Forest McGinnis, \$6.00; No. 545, Jesse Robinetts, \$4.50. These are in transit and as soon as returned will be placed on file.

We would respectfully report that we estimate the income for the ensuing year as follows, in addition to the balances shown:

Morrill Act	\$20,000.00	
State Interest (estimated)	10,000.00	
Special—Acts 1901 and 1907	37,500.00	
Local Station Fund—Farm (estimated)	2,500.00	
Hatch and Adams	24,000.00	\$104,000.00
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Out of the above amount will have to be paid the appropriation made

by the Board to aid in the construction of the woman's building, amounting to \$10,000.00.

In addition to the above amounts there was an appropriation for the betterment of the College and Station of \$125,000.00—\$65,000 of which is available this year and \$60,000 that can be expended next year.

All of which is respectfully submitted,

J. T. APPERSON,
CLARA H. WALDO,
AUSTIN T. BUXTON,
Finance Committee.

TREASURER'S REPORT, 1908.

Corvallis, Oregon, July 15, 1908.

To the Honorable Board of Regents,

Oregon Agricultural College.

Gentlemen:—Herewith I submit my report for the year ended June 30, 1908. The vouchers and other evidences of payment are on file in the office of the Clerk and Purchasing Agent.

Very respectfully,
B. F. IRVINE,
Treasurer.

FINANCIAL STATEMENT—ACCOMPANYING TREASURER'S REPORT.

YEAR ENDED JUNE 30, 1908.

STATION FUNDS.

Balance on hand July 1, 1907—Local Station..	\$	25.47
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INCOME.

Hatch	\$	15,000.00	
Adams		9,000.00	
Local Station		2,584.48	\$ 26,584.48
Total			\$ 26,609.95

DISBURSEMENTS.

Hatch	\$	15,000.00	
Adams		9,000.00	
Local Station		2,564.37	\$ 26,564.37
Balance	\$		45.58

BALANCE BY FUNDS.

Local Station	\$	45.58
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TREASURER'S REPORT

243

COLLEGE FUNDS.

Balance on hand July 1, 1907:		
Improvement	\$ 13.76	
Special	3,008.19	
Laboratory	2,271.92	\$ 5,293.87

INCOME.

Morrill	\$ 30,000.00	
State Interest	11,550.87	
Improvement	629.70	
Special	43,750.00	
Laboratory	4,617.40	\$ 90,347.77
Total		\$ 95,641.64

DISBURSEMENTS.

Morrill	\$ 30,000.00	
State Interest	10,643.53	
Improvement	527.12	
Special	46,703.37	
Laboratory	6,889.32	\$ 94,763.34
Balance		\$ 878.30

BALANCE BY FUNDS (COLLEGE).

State Interest	\$ 707.14	
Improvement	116.34	
Special	54.82	\$ 878.30

BALANCES BY FUNDS (ALL FUNDS).

Station	\$ 45.58	
College	878.30	\$ 923.88

SUMMARY—ALL FUNDS.

Balance on hand July 1, 1907..	\$ 5,319.34	
INCOME.		
Station	\$ 26,584.48	
College	90,347.77	\$ 116,932.25
		\$ 122,251.59

DISBURSEMENTS.

Station	\$ 26,564.37	
College	94,763.34	\$ 121,327.71

Total balance—All funds.....	\$ 923.88
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MISCELLANEOUS RECEIPTS, INCLUDED ABOVE, AND THEIR DISTRIBUTION.

Source.	Amount.	Local Station.	Impt.	Labrty.
Agriculture	\$ 969.76	\$ 969.76	.....	.....
Dairy	1,125.32	1,125.32	.....	.....
Horticulture	489.40	489.40	.....	.....
Miscellaneous—Rents, etc	629.70	.....	629.70	.....
Miscellaneous—Diplomas.	420.00	.....	.....	420.00
Totals	\$3,634.18	\$2,584.48	\$ 629.70	\$ 420.00

COLLEGE FUNDS.

MORRILL, STATE INTEREST, SPECIAL, IMPROVEMENT, AND LABORATORY.

Departments.	Labor.	Supplies.	Salaries.	Totals.
Printing	\$ 173.23	\$ 1,380.94	\$ 1,375.00	\$ 3,929.17
Agriculture	489.00	107.09	441.85	1,037.94
Dairy	17.70	25.73	411.85	455.26

Horticulture—Coote...	2,589.88	158.15	700.10	3,448.13
Botany	103.20	350.91	1,600.00	2,054.11
Chemistry	527.90	2,177.08	2,350.00	5,054.98
Bacteriology	8.40	4.11	338.40	350.91
Entomology	117.40	278.41	1,417.10	1,812.91
Mechanics	798.71	2,335.61	5,870.05	9,004.37
House Economy.....	56.59	222.75	1,680.00	1,959.34
Pharmacy	50.15	584.30	1,400.00	2,034.45
Library	31.20	110.47	420.00	561.67
Horticulture—Lewis...	99.18	78.30	406.25	583.73
Mining	18.50	171.73	1,500.05	1,700.28
Poultry	222.40	162.20	1,300.00	1,684.60
Agronomy	51.90	205.55	790.40	1,047.85
Salaries outside.....			21,419.62	21,419.62
R. E. Heater			637.50	637.50
Ross Finley			68.75	68.75
P. C. Adams			411.76	411.76
Totals	\$ 5,355.34	\$ 9,363.33	\$ 44,588.68	\$ 59,257.35

MISCELLANEOUS.

Sanitary	\$ 211.00	
Furniture	72.35	
Traveling expenses	1,954.21	
Advertising	740.45	
Fuel	2,009.65	
Insurance	240.04	
Postage	558.60	
Freight	766.49	
Telephones and telegrams	502.29	
Tools and machinery	155.50	
Building repairs—General	4,285.52	
Miscellaneous labor	994.22	
Miscellaneous supplies	1,076.56	
Janitors—Extra	1,734.94	
J. A. Spangler—Engineer.....	640.00	
R. C. Wills—Carpenter	675.00	
E. P. Erwin—Head janitor.....	650.00	
Military—Including commandant	551.34	
Cauthorn Hall	128.10	
Waldo Hall—Including water and sewer.....	2,391.68	
Miscellaneous and current.....	5,590.55	
Waldo Hall—Snook & Burggraf—Finals.....	9,577.50	\$ 35,505.99
Totals		\$ 94,763.34

STATION FUNDS.

HATCH, ADAMS, AND LOCAL STATION.

Departments.	Labor.	Supplies.	Salaries.	Totals.
Printing	\$ 178.46	\$ 819.03	\$ 605.00	\$ 1,602.49
Agriculture	1,508.68	1,325.74	1,558.15	4,392.57
Dairy	755.95	163.97	988.15	1,908.07
Horticulture—Coote...	140.18	5.38	199.90	345.46
Agronomy	323.55	133.96	459.60	917.11
Chemistry	695.20	9.56	2,040.00	2,744.76
Bacteriology	11.20	16.22	1,361.60	1,389.02
Entomology	1,435.10	317.28	1,483.10	3,235.48
Poultry		6.85	350.00	356.85
Library		1,136.48	180.00	1,316.48
Horticulture—Lewis...	2,638.04	530.72	1,352.20	4,520.96
T. H. Crawford.....			550.00	550.00
H. L. Holgate.....			470.00	470.00
Totals	\$ 7,686.36	\$ 4,465.19	\$ 11,597.70	\$ 23,749.25

MISCELLANEOUS.

Traveling expenses	\$ 1,033.26
Freight	111.14
Scientific	484.86
Tools and machinery	149.32

TREASURER'S REPORT

245

Miscellaneous labor	171.42	
Miscellaneous supplies	40.10	
J. A. Spangler	60.00	
E. P. Erwin	350.00	
Miscellaneous and current	370.02	
Livestock	45.00	\$ 2,815.12
Total		\$ 26,564.37

EASTERN OREGON EXPERIMENT STATION.

YEAR ENDED JUNE 30, 1908.

Balance in bank at Union, June 30, 1907.....	\$ 1,128.19	
Received from State appropriation, five quarterly payments	9,375.00	\$ 10,503.19
Disbursements—11 months		\$ 4,352.25
Balance May 31, 1908.....		\$ 6,150.94

FARMERS' INSTITUTE FUND.

Amount of appropriation for the year 1908.....	\$ 2,500.00
Claims for expenses have been presented and allowed.....	219.40
Balance available June 30, 1908.....	\$ 2,280.60

APPROPRIATION OF 1907.

Appropriation		\$ 65,000.00
Cattle barn cost.....	\$ 15,614.90	
Mechanic arts building cost to date.....	42,314.80	
Miscellaneous equipment	6,842.47	\$ 64,772.17
Balance in fund		\$ 227.83

There is a balance due Mr. A. F. Peterson on contract the sum of \$1,000.00, for which we have the architect's certificate. This leaves a deficit in the fund of \$772.17, to be paid out of some other fund.

APPROPRIATION OF 1908.

Appropriation		\$ 65,000.00
BILLS ALLOWED BY SECRETARY OF STATE.		
Equipment	\$ 11,140.49	
Improvement	3,227.31	\$ 14,367.80
Balance at date.....		\$ 50,632.20

REPORT OF THE FINANCE COMMITTEE.

Corvallis, Oregon, July 15, 1908.

To the President and Members of the Board of Regents
of the State Agricultural College.

We, your Finance Committee, after having checked over the reports, vouchers and check books of the Accountant and Treasurer of the Board, would respectfully report as follows:

We find there are no vouchers on file in the State Interest Fund for check No. 3805, for \$325.00;

In the College Fund for checks No. 1836, for \$46.50; 1839, for \$167.50;

In the Local Station Fund for checks No. 625, 627, 628, 630, 631, and 632;

In the Laboratory Fund, checks No. 230, 233, 234, 236 to 241 inclusive, No. 246, 251, 254, 258, 259, 261, 262, 263, 265, 267, 268, 272, 275, 278, 284, 288, 300, 302, and 303.

These checks were all drawn for the month of June and the vouchers have not yet been returned.

We find that there was a balance on hand to the credit of the Experiment Station at beginning of the year July 1, 1907, the sum of \$25.47. The aggregate receipts during the year amount to \$26,584.48. Total to be accounted for, \$26,609.95.

We find that the aggregate disbursements on account of this fund during the year amounts to \$26,564.37, leaving a balance in the Local Station Fund to the credit of this account of \$45.58.

We find that there was a balance on hand to the credit of the College Account at the beginning of the year July 1, 1907, \$5,293.87. The aggregate receipts during the year from all sources, account of this fund, amounts to \$90,247.77, making total to be accounted for, \$95,641.64. There has been expended during the year from this account the sum of \$94,763.34, leaving a balance on hand at date to the credit of the different funds as follows:

State Interest	\$	707.14
Improvement		116.34
Special Maintenance		54.82
Making a total of.....	\$	878.30

We find from the accounts that there is due to the College from the Farmers' Institute Fund of the State of Oregon, for year ending December 31, 1908, the sum of \$2,500.00. From this fund there has been drawn \$219.40, leaving an unexpended balance of \$2,280.60.

There was appropriated by the State Legislature at the session of 1907, for the College and Station, for the year ending December 31, 1907, the sum of \$65,000. From this amount there has been constructed a cattle barn, at a cost of \$15,614.90; a mechanics arts building costing \$43,314.80; for miscellaneous equipment there has been expended \$6,842.47; total, \$65,772.37. This leaves a deficit to be provided for of \$772.37.

There was appropriated by the State Legislature at the session of 1907, for the College and Station, for the year ending December 31, 1908, the sum of \$65,000. There has been allowed and paid of this fund for equipment and improvement the sum of \$14,367.80, leaving a balance on hand of \$50,632.20. There are bills now pending, before the Secretary of State, against this fund amounting to \$1,088.08.

There was appropriated by the State Legislature at the session of 1907, for the running expenses of the Eastern Oregon Experiment Station from January 1, 1907, to December 31, 1908, the sum of \$15,000. As per account of the Treasurer of the Board, there has been drawn from this fund the sum of \$11,250, leaving a balance still due from this appropriation in the hands of the Treasurer amounting to \$3,750. It appears from the bank book of the Treasurer of the Board that there has been paid out of this fund, the sum of \$6,229.01; according to his bank account, this would leave a balance on hand to the credit of this fund amounting to \$5,020.99.

We find upon examination that the account of the Treasurer agrees with the accounts of the Clerk and Purchasing Agent of the College and Station, as to the amount of money received, and disbursements made.

Respectfully submitted,

J. T. APPERSON,

CLARA H. WALDO,

AUSTIN T. BUXTON,

Finance Committee.



INDEX

	<i>Page.</i>
Adams Act	37
Administration building	19
Administrative Council	22
Agriculture—	
Additional room required	49
Agronomy	48, 117
Animal Husbandry	50, 117
Chemistry, Agricultural	161
Co-operative work with Government	61, 65, 66, 67, 70
Cordley, Dean—Quoted	47
Cordley, Dean—School Report	107
Dairy building needed	52
Dairy Husbandry	51, 118
Dean's Report	107
Degree courses in	110
Departments in School of	117
Diversified farming	69
Drainage and Irrigation	58, 63
Dry-farming branch station	69
Durum wheat	68
Elementary courses in	109
Entomology	158, 160
Experiment Station	59, 60
Extension, College	71-75
Facilities, Need of increased	116
Farmers' Institutes	74
Government co-operates in branch station work.....	65-70
Horticulture	49, 119, 160
Industrial economics	59
Instructors increased	46
Irrigation and Drainage	58, 63
Irrigation, Branch station	64-68
Land needed	62
Live stock needed	50, 62
Poultry Husbandry	52, 120
Requirements	117, 118
Routine station work	61
Tuberculosis	54-57
Umatilla branch station	65-68

	<i>Page.</i>
Agriculture (continued)—	
Union branch station	62, 172
Veterinary Science	120, 53-57
Agricultural building	91
Agronomy	48, 117, 193
Agronomy building	18
Alpha Hall	19
Animal Husbandry	50, 117, 194
Appropriation for buildings	15-18
Architecture	79, 132
Armory and drill hall	87, 90, 102
Art	86, 216
Athletic Association	90
Athletics	89-90
Athletic field	97
Attendance —	
For 1906-1907	149-152
For 1907-1908	152-156
Increase in	4
Auditorium and library building	93
Bacteriology	86, 211
Bailey, Dean—Quoted	29
Bexell, Dean, Report of	135
Botany	86, 207
Book Store	24
Blackman, Dr.—Quoted	35
Brown, U. S. Commissioner—Quoted	30, 36
Business methods followed	23
Business Office	24
Buildings and Improvements—	
Administration building	19
Agronomy building	18
Alpha Hall	19
Cauthorn Hall	19
Dairy barn	17
Mechanic Arts building	16
Mechanical Hall	19
Mining laboratory	20
Old barns removed	20
Poultry buildings	17
Shepard Hall	19
Waldo Hall	15
Campus	220
Carnegie Foundation	12
Oregon Agricultural College not eligible	15

Carnegie Foundation (continued)—	<i>Page.</i>
Pritchett, President—Quoted	13
Purpose of	14
Cauthorn Hall	19
Chemistry	21, 85, 210
Civil Engineering	21, 126
College Council	22
Cordley, Dean	47, 107
Covell, Dean—Report	125-132
Commerce, School of	82-83, 135, 206
Courses of Study—	
Adapted to needs of people	26
Changes in	24
Elementary	26, 130
Industrial Pedagogy	27
Revision of	25
Standard advanced	24
Sub-Freshman course abolished	25
Summer school	32
Dairy Barn	17
Dairy Husbandry	51, 118
Deans appointed	22
Departmental estimates of requirements.....	192-229
Domestic Science and Art	80-81, 121, 198
Drainage and Irrigation	58, 63
Drawing	86, 216
Dry-farming branch station	69
Durum wheat	68
Elementary courses	26, 109
Enrollment	4, 149-156
Engineering and Mechanic Arts	75-79, 130-132
Civil Engineering	21, 126, 203
Electrical Engineering	21, 127, 204
Importance of	44
Mechanical Engineering and Mechanic Arts.....	21, 128, 199
Requirements	132-134
English Language and Literature	86, 215
Entomology	158, 160
Equipment	20, 98, 101
Extension work	71, 75
Experiment Station—	
Director's report	157
Experimental work	36-38, 59-60, 97
Requirements	227

Faculty—	Page.
Carnegie Foundation	12
Division of work	9
Importance of permanency in positions of	12
Labored under adverse conditions	10
Number in	9
Organization of	22
Salaries of	10
Salary lists of	229-238
Statistics of	9
Strong faculty required	11
Farmers' institutes	74, 174, 179
Federal Acts	33, 34, 37
Finance Committee reports	240, 245
Finances, College, reports on (See "Salaries")	239-247
Forestry	83, 137, 207
Foundry and wheelwright shop needed	77, 95
Function and scope	45
Government co-operates in branch station work	65, 70
Graduates	8
Greer, Dean—Report	121
Hamilton, Hon. John—Quoted	71
Hatch Act	37
Heating plant	95-96, 185, 222
Highway engineering	78
History	86, 216
Home economics	44
Horticulture	49, 119, 160, 194
Horticultural building	91
Improvements	19, 98, 101, 226
Industrial courses, short	26
Industrial economics	59
Industrial Pedagogy—	
Bailey, Dean—Quoted	29
Professorship established	27-31
Purpose of	27
Summer school	32
Trained teachers needed	29-31
Brown, Commissioner—Quoted	30
Instructional corps	26, 46
Instructors, ratio of students to	10
Irrigation and drainage	58, 63
Irrigation, branch station for	64-68
Janitorial requirements	220
Lake, Prof. E. R.—Report	137

	<i>Page.</i>
Land-grant institutions—	
Business principles applied	41
Development of agriculture, etc.....	39-44
Disciplinary value of training	41
Distinctive technical work	39
Engineering, Importance of	44
Enrollment statistics	5
Home economics	44
Liberal education	39
Old and new education	43
Statistics	42
Land needed	62, 96, 97, 169
Library	90, 93, 144, 218
Latin	86
Light and Power	185, 222
Live Stock needed	50, 62
Maintenance	99-100
Mathematics	21, 86, 215
McKellips, Prof. C. M.—Report.....	141
Mechanic Arts building	19
Mechanical Engineering	21
Military Science and Tactics	86, 217
Mining Engineering	21
Mining laboratory	20
Modern Languages	86, 216
Morrill Acts	33-34
Movable schools	73
Music	87-88
Needs—	
Armory and Drill Hall	92
Auditorium and Library	93
Central Agricultural building	91
Equipment	999
Experiment Station	97
Foundry and wheelwright shop	94
Heating plant	94
Horticultural building	91
Improvements	98
Land	96
Maintenance	99
Nelson amendment	34-35
Oregon Agricultural College—	
Courses offered	45
Field of work	38
Function and scope	45

	<i>Page.</i>
Organization	21-23
Pharmacy	21, 84, 141, 209
Physical Education	89-90, 216
Physics	86, 212
Plumbing	94
Poultry buildings	17, 52, 120
Prichett, President	13
Printing plant	219
Purpose and Scope—	
Experimental work required	36
Adams Act	37
Hatch Act	37
State support	38
Wilson, Secretary James—Quoted	38
Federal Acts	33-34
Obligation of State to Government	35
Oregon Agricultural College	38
Scope defined	36
State Laws	33
Subjects classified	36
Railroads, assistance of	74
Repairs	98, 223
Registrar, Report of	149, 219
Requirements, Departmental estimates of ("See Needs")	192-229
Salaries of faculty members	11-12
No increase in	100
Salary list for 1906-1907	229
Salary list for 1907-1908	232
Salary list for 1908-1909	234
Schools established	22
Scope defined	36
Shepard Hall	78
Shops, New	16, 133
Short Industrial courses	26
Steam fitting	94
Standard advanced	24
State support	38
Stenographic assistance	219
Students—	
Age of	7
Attendance:	
Increase in	4
For 1906-1907	149-152
For 1907-1908	152-156

Students (continued)—	<i>Page.</i>
Book Store established for	24
Character of student body	8
Comparative statistics	5
Enrollment distribution	4
Graduates	8
Ratio of students to teachers	10
Self-supporting	7
Vocations represented	7
Sub-Freshman course abolished	25
Teachers, Demand for	29-31
Treasurer's Report, 1907	239
Treasurer's Report, 1908	242
Teachers, ratio of students to	10
Tuberculosis	54-57
Umatilla, branch station	65-68
Union Station	62, 172
United States Commissioner of Education	30-36
Veterinary Science	22, 53-57, 120
Vocations of students	7
Waldo Hall	15, 22
Wilson, Secretary James—Quoted	38
Withycombe, Dr. J.—	
Report Experiment Station	156
Report Farmers' Institutes	179
Zoology	85, 209