BIENNIAL REPORT

OF THE

State Agricultural College,

AT

CORVALLIS, OREGON.

TWELFTH BIENNIAL SESSION.

SALEM, OREGON:
W. H. ODELL, STATE PRINTER.
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CALENDAR FOR 1882–1883.

September 4, 1882,	Session begins.
December 1, 1882,	Second Term begins.
March 1, 1883,	Third Term begins.
June 4, 1883,	Meeting Board of Trustees.
June 6, 1883,	Commencement Day.

BIENNIAL REPORT.

To His Excellency, Gov. W. W. Thayer:

SIR:—I have the honor to submit the following Biennial Report of the Agricultural College, for the years 1881–2:

The people seem to require a fuller statement than we have heretofore given; I shall, accordingly, be more minute.

Rational Agriculture proposes to teach the young farmers of the country three things:

I. The nature, quantity and sources of plant-food.

II. The methods which have been established by experience for changing this food into plants.

III. The best uses of these plants; that is to say, how the plants can be used to produce the greatest amount of human happiness. Hence there are three distinct classes of subjects required in a complete course of Scientific Agriculture.

I. *Class first* treats of the nature, quantity and sources of Plant-food.

The sciences relative to this are:

1. Chemistry.
2. Mineralogy.
3. Geology.

These studies belonging here are distributed into three classes:

I. *Junior Class.*—The study of this class is General Chemistry (inorganic).

II. *Intermediate Class.*—General Chemistry (organic), Mineralogy, and Agricultural Chemistry.

III. *Senior Class.*—Analytical Chemistry, Agricultural Chemistry and Geology.

II. Class second treats:

1. Of the methods of changing plant-food into plants.

Here belong:

1. The methods of rendering *Potential Plant-food Actual*, or of preparing the food for the plant (such methods are, *vest*, *fallow*, *rotation*, *green crops*, *mechanical improvement*, *&c.*, *&c.*).
2. Drainage.
3. Botany.

4. Entomology [insects injurious to *vegetation*, and such as are useful to man, &c.].
5. Meteorology.
6. Forestry.

These studies are distributed into three classes:

I. *Junior Class.*—Soils and methods for rendering potential plant-food actual. Botany.

II. *Intermediate Class.*—Same subjects continued. Grasses, fruit culture.

III. *Senior Class.*—Drainage, Meteorology, Entomology (including Bee Culture), Forestry.

III. Class third treats of the use of plants and considers the best methods for such use. Here belong:

1. Harvesting and preservation of crops.
2. Stock-breeding (including Phyiology and Zoology).
3. Farm engineering (including drawing and construction of farm buildings).
4. Landscape gardening.
5. Political economy.

These studies are divided into three classes:

I. *Junior Class.*—Methods of harvesting and preserving crops, Farm Engineering, Phyiology.

II. *Intermediate Class.*—Drawing, Zoology and Stock-breeding in particular.

III. *Senior Class.*— Drawing, Stock-breeding, Landscape Gardening, Political Economy.

Preparation Needed for Entering these Courses.—Algebra and Geometry and all the Elementary Courses necessary to these subjects (Geometry and Algebra).

Remark.—A course of Scientific and Literary Study is provided.

STATEMENT OF WORK DONE BY EACH TEACHER OF THE SCHOOL.

The following is assigned to me:

1. Chemistry, both general and analytic.
2. Agricultural Chemistry.
3. Drainage.
4. Meteorology.
5. Physics.
6. Natural Philosophy.

7. Moral Science, including Logic, Mental Philosophy, Ethics, Political Economy.
8. Drawing (mechanical).
9. Landscape Gardening.

During the past year I have given instruction in all of these subjects except Meteorology, Drawing and Landscape Gardening. I have made such arrangements as will enable me hereafter to teach Mechanical Drawing.

BOTANY, FRUIT CULTURE AND LANGUAGES.

B. J. HAWTHORNE, TEACHER.

President B. L. Arnold:

SIR:—Following is the report of my work for the past two years:

From the great number of subjects I have to teach, it is found impossible to give that time to each separate study which is necessary in order to carry theory into practice to its fullest extent.

A multiplicity of recitations—teaching from 9 o'clock in the morning until 4 o'clock in the evening—leaves very little time for outdoor experiments and original research. For the last two years, I have taught Latin, Greek, German, Anglo-Saxon, English, Botany and Fruit Culture.

BOTANY.

My plan is to teach the subject as far as practicable with living specimens. Accordingly, I take the class into the forest and require each member to collect plants for himself—to study, to name and to preserve.

Last year the Agricultural Department at Washington, D. C., was kind enough to donate to the State Agricultural College of Oregon, a box of valuable specimens of plants, representing nearly every quarter of the globe, and numbering about one thousand.

The Census Department, also, presented a large number of beautiful specimens of wood, collected in various parts of the United States when the last census was taken. I have added about five hundred specimens of Oregon plants, which I, myself, have collected, mostly in the Willamette valley and along the sea coast, west of here. This work was done principally in vacation.

My thanks are due the authorities of the West Side Railroad for reduced rates of fare along the whole line, granted me while engaged in collecting plants. Prof. L. F. Henderson, of Portland High School, has courteously aided me in botanizing.

The students are taught that success in this department depends almost wholly upon their industry, activity and observation.

They have worked faithfully and zealously.

GRASSES.

During a part of last session, I taught a class that recited every other day on the subject of grasses. The principal kinds of grasses—those suitable for hay, those best for pasture, those that live through the winter, those that resist drought, how to prepare the land for a permanent meadow, what is the best soil for a particular kind of grass, for grasses in general, what is a good mixture of grasses for dry land, for wet land, for medium—all these questions and many others were discussed in the lecture-room.

I have plats of grasses, containing thirty-seven kinds, from which I shall save specimens and gather seeds. The seeds of grasses are kept on exhibition in the class-room; thus, the students may become familiar with the forms of the seeds.

TESTING SEEDS.

It is respectfully recommended that a seed-testing station for the State be established. In his report of 1880, that distinguished botanist, Dr. Beal, of the Michigan Agricultural College, says:

"I have found the greatest frauds in grass seeds. One of the best firms in New York sent me some seeds of grass, which were rotten or had been cooked. At another time the firm was about to buy what was called 'Bermuda grass.' The material consisted of the chaff or hulls of Bermuda grass, every one of which proved to be empty or in flower. Not one good seed was found. 'Adulterations were discovered [at a testing station in Europe], most ingenous in character, harmful in effect, and remarkable in amount.'

Enough has been done in this country to convince almost any sensible person that seed-testing stations could be made economical investments."

In a letter to an agricultural paper, a farmer states that he bought forty bushels of blue grass seeds, prepared his land well, and sowed them carefully—and not one seed came up.

I am now giving some attention to this subject of testing seeds; and I will do all that I can hereafter to prove by experiments the best plans for determining which are good seeds and which are not.

FRUIT CULTURE.

The class has been drilled in the manual operation of grafting and budding. Following are some of the points discussed: How to pre-

pare the grafts, the age of the stocks, the right kind of buds, whether fruit-buds or wood-buds, cross-breeding, layering, training, pruning, preparation of the soil, transplanting, whether the soil of the orchard should be stirred or allowed to produce grass and weeds, without any ploughing.

BORERS.

In some parts of the State, plum borers have been killing the trees. They are similar to the common apple borers; but they do not seem to be identical with them. They work around the collars of the plum trees in Spring, and soon kill the trees. I know of no preventive against them; but the trees attacked may be examined, and the borers may be killed while at work.

FORESTRY.

Next session I will organize a class in Forestry, and make such experiments as circumstances will permit.

Respectfully submitted,

B. J. HAWTHORNE.

OREGON STATE AGRICULTURAL COLLEGE, July 21, 1882.

SCHOOL OF MATHEMATICS.

JOSEPH EMERY, TEACHER.

President B. L. Arnold:

SIR:—I have the honor to present the following biennial report of this department:

The course is divided into four classes:

FRESHMAN.

Higher Algebra and Geometry.

SOPHOMORE.

Trigonometry, Surveying and Engineering.

JUNIOR.

General Geometry and Differential Calculus.

SENIOR.

Integral Calculus, and the application of the Calculus in tracing curves, and *Astronomy.*

Special attention is given to the mental development of the student, and the discipline of his mental powers, for which the study of Mathematics excels all others.

The practical utility of this branch of science is constantly impressed upon the student, and, as far as possible, taught and illustrated by some useful application in the field of practical life.

The adjustment of the compass and theodolite is fully explained, and field practice given in Surveying and Engineering.

Text-books—Olmstead, Davies and Olney; Courtney and Todhunter for reference.

In addition to the above, I have taught Mineralogy and Geology. Text-books—Dana and LaConte. And in the

SCHOOL OF AGRICULTURE

Zoology and Stock-breeding. I have delivered annually a course of lectures on Domestic Animals; their Origin, Utility, Methods of Improving and Taking Care of Stock, etc., etc.

All the Agricultural Students in the College Department are required to attend these lectures.

CABINET.

A large number of Geological and Mineralogical specimens have been added to our Cabinet during the last two years; these have been collected principally from the Geological Strata of Oregon, at no little expense of time and travel by the teacher in this department.

We earnestly solicit contributions to our Cabinet from friends of education throughout the State.

Very respectfully,

JOSEPH EMERY.

July 18, 1882.

GRADUATES.

1870.

James K. P. Currin, B. S.....Cottage Grove.
Robert McVeatch, B. S.....Cottage Grove.

1871.

George F. Burkhart, B. S.....Lebanon.
James D. Fountain, B. S.....Jacksonville.
W. R. Privett, B. S.....Corvallis.

1872.

Thomas B. Alexander, B. S. ..... Benton County.
*John Eglin, B. S. ..... Benton County.
Alonzo J. Locke, B. S. ..... Corvallis.
James K. P. Weatherford, B. S. ..... Linn County.

1873.

Leander N. Liggett, B. S. ..... Albany.
William F. Herrin, B. S. ..... Jacksonville.
Oscar L. Isom, B. S. ..... Baker City.

1874.

John R. Bryson, B. S. ..... Brownsville.
Thomas H. Crawford, B. S. ..... Norton's.
Emmet H. Taylor, B. S. ..... Corvallis.
George A. Grimes. ..... Harrisburg.
William C. Crawford ..... Norton's.

1875.

Reuben A. Fuller, B. S. ..... Corvallis.
Philip E. Linn, B. S. ..... Eagle Creek.

1876.

Franklin Cauthorn, A. M ..... Corvallis.
*Isaac Jacobs, B. S. ..... Corvallis.
George P. Lent, B. S. ..... East Portland.
Newton A. Thompson, B. S. ..... Benton County.

1878.

S. Thomas Jeffreys, A. B. ..... Independence.
Frederick W. Vincent, B. S. ..... Corvallis.
Elvin J. Glass, B. S. ..... Corvallis.
Moses Neugass, B. S. ..... Corvallis.

1879.

*Ernest White, A. M. ..... Albany.
Bartholomew T. Soden, B. S. ..... Hubbard.
Marion Elliott, B. S. ..... Corvallis.
Dayton Elliott, B. S. ..... Corvallis.

1880.

William E. Yates, A. M. ..... Corvallis.

Shubel G. McCann, A. B.....Corvallis.
Edgar Grimm, B. S.....Marion County.

1881.

Elmer E. Charman, A. B.....Oregon City.
T. Leonard Charman, B. S.....Oregon City.

1882.

William Y. Masters, A. M.....Portland.

*Deceased.

CATALOGUE OF STUDENTS.

Average each year, about sixty.

Edwin J. Abby.
James H. Alexander.
Alonzo W. Allen.
Judson Avery.
Frank Batcheller.
Henry L. Bents.
Arthur Bowersox.
Vineyard C. Brock.
Andrew S. Buchanan.
Robert G. Buchanan.
William A. Buchanan.
William G. Campbell.
Henry E. Carter.
William D. Casteel.
J. Luther Caton.
Elmer E. Charman.
T. Leonard Charman.
Benjamin F. Collins.
James H. Collins.
Charles E. Cone.
Homer Cone.
Albert E. Cook.
Edwin L. Davis.
Virgil A. Davis.
William H. Edmunds.
James L. Eglin.
Elda J. Elliott.
James Mc. Emery.
Charles W. Fisher.
Frank L. Fisher.
A. C. Ford.
David H. Glass.
R. F. Guilliam.
Burres S. Hastings.
Henry G. Hastings.
A. F. Hershner.
Arthur E. Holgate.
Isaac L. Holman.
William H. Holman.
Charles Horning.
Baxter F. Howard.
Jefferson D. Howard.
Andrew J. Hodges.
Geo. B. Hovenden.
Geo. F. Hughes.
Edwin D. Jackson.
Edgar Jackson.
Orville O. Jennings.
Judge P. Johnson.
William W. Johnson.
Andrew T. Keesee.
Herbert Kittredge.
Ernest A. Korthauer.
John Læbo.
Plutarch Lewis.
George Lilly.

Leslie Lilly.
James K. Locke.
William T. Locke.
William C. Logan.
Isaac Looney.
William Y. Masters.
Barney S. Martin.
Frank S. Mattoon.
George W. Miller.
W. E. Newton.
Edward Palmer.
William H. Powell.
Frank L. Priest.
Edward L. Rayburn.
Moses Robnett.
William Robnett.
W. F. Ryals.
Chester W. Skeels.
Hugh W. Simpson.
George W. Simpson.
Leo I. Stock.
Sol. Stock.
Arthur A. Stout.
Richard Taylor.
James Trafzer.
Henry Weiman.
Geo. C. Will.
Dandridge M. Williamson.
Jacob L. Williamson.
John N. Williamson.
Robert N. Williamson.
George D. Wood.
Samuel M. Wood.
Otto Wrenn.
Fred L. Wright.
Fred J. Yates.

Total ..... 92.

DEGREES.

There are two degrees for Agricultural Students, that is, for such as pass the course of Agriculture.

FIRST DEGREE, B. F.—BACHELOR OF FARMING.

This degree is conferred on those who complete the course prescribed above.

SECOND DEGREE, M. F.—MASTER OF FARMING.

This degree is conferred on such as have obtained the degree of B. F., and shall have worked on a farm under the directions of some good farmer, for two years.

Remarks.—It is not pretended that a boy who studies this course of instruction will be a better farmer than a man who, though he has never studied it, has been farming for twenty years; but it is contended that a boy who has studied the subjects here laid down, will be after twenty years of farming, a better farmer than one who, though he has farmed for twenty years, has never studied this or a similar course of instruction in Agriculture.

MEDALS.

THE STATE GRANGE MEDAL.

The State Grange, at its last meeting, passed the following resolution:

Resolution No. 10, by Mary J. Harris, was adopted as follows:

Resolved, That the Worthy Master of our State Grange be authorized to award a prize to the best student in the graduating class on general agriculture, to be awarded on recommendation of the committee in connection with the faculty of the State Agricultural College.

The Grange of Oregon deserves great thanks from the College for its honest efforts in behalf of its prosperity. I call attention to the following report of the Grange Committee on Examinations:

REPORT

Of the Committee appointed by the State Grange to attend the Examinations of the Agricultural Students at the Agricultural College.

Bro. J. Minto proceeded to read the following report from the Committee appointed to visit the Agricultural College at Corvallis. Report adopted. Motion to reconsider lost:

Worthy Master, Officers and Members of the Oregon State Grange:

Your committee appointed at the last annual meeting of the Oregon State Grange to visit the Oregon State Agricultural College during the examinations had at the close of the school year in May last, beg leave to report: That we attended the school, and were present during the examination exercises of the Senior Class in Agriculture.

There were some half-a-dozen young men in the class, who each read an essay on a subject connected with agriculture as a science. Such as: The Formation of Soils; Geology as connected with Agriculture; Summer Fallowing and its Uses; Drainage and its Effects; Rotation of Crops, or Means of Preserving Fertility; Restoring Exhausted Land by Manures.

The treatment each of these respective subjects received from the student who made it his especial theme, and the answers given to the searching questions propounded to them by President Arnold and your committee, proved to us that it was no sham work that was being done in the school. Your committee saw little sign of any local interest taken in the College, and though we received evidence of the teachers being a body of devoted men, we must in candor say, we also received the impression that they do not receive that measure of encourage-

ment from public interest to which their labors or their influence on society entitle them.

On the question of the schools connected with, and the practical benefit to the agriculture of our State, it did not seem to your committee to be meeting the expectations which may be justly placed upon it, and its failure in that respect we are constrained to believe, is on account of a lack of public appreciation of, and interest in it as a school of Agriculture and Mechanical Arts.

The question was asked one of the young men who graduated, "if he expected to make use of the knowledge of agriculture he had received from his studies in practical farming?" He candidly answered that he did not, and his answer seemed to be the same that most, if not all of the students in the school expected, and would themselves have given.

With a desire to probe further into this indifference to joining scientific with practical agriculture, and thus to find some guide to a suggestion for its removal, a portion of your committee brought the subject to the attention of the Oregon State Agricultural Society at its last annual meeting, in a proposition to make recommendation to a cadetship in the State Agricultural College, a prize to be awarded to the most proficient student of a district school.

During the discussion of this proposition, Bro. Apperson, State Senator for Clackamas county, informed the Society that he had been inquiring during his term of office for a youth in his own county who would accept his nomination to a cadetship in the Agricultural College, and failing to find one in Clackamas, he had taken some pains to find one in Marion county, but without success.

While this condition of indifference is manifested on the part of the general public, and the youth who are passing through the course of instruction, smile with amusement at the idea of urging scientific knowledge as an aid to practical farming;

While even members of our State Legislature use the results of instruction received at ordinary high schools, in holding up to farmers as a class for amusement the terms used to define the higher branches of mathematics in this College. There is probably not an editor connected with the agricultural press of the Pacific coast who could give at sight the correct botanical names of a dozen varieties of grains, grasses or forage plants. And while the columns of such papers are used as a means of controversy about the value and identity of grasses and grains which have long been known in general agriculture, by men grown gray and decrepit in the long and laborious process of gathering knowledge of farming, solely by personal experiment and experience, there has yet been no successful attempt made on this coast to prepare young men for the occupation of agriculture, as the lawyer

is instructed in the law school, and the physician in the medical school.

Your committee are aware that in the past, the cultivation of the soil has been conducted under such favorable circumstances in the western portion of the United States, that muscular labor with the most rudimentary knowledge of natural causes has been sufficient to insure a competence to the industrious, but, believing that the youth of to-day, who devote their manhood to tillage, will, before old age overtakes them, find themselves confronted by such a question as, "How best to maintain a fertile soil, or restore an exhausted one?" no time should be lost, no reasonable effort should be spared to arm the youth of the yeomanry of this Northwest coast during their student days, with all the knowledge of scientific aids to agriculture which the best equipped schools can furnish.

We would therefore recommend, as a course of action calculated to aid in the establishment of this school (founded for the instruction of farmers and mechanics), that the membership of our Order take an interest in its management, and help to enable it to meet the requirements of such an institution, by placing themselves in communication with its faculty of teachers whenever they have a question to solve that practice may reasonably ask of science. The members of the present faculty gave assurance to your committee, that they would deem it both a pleasure to themselves and a benefit to the College, to establish and cultivate more intimate relations with practical farmers. They have been forced by experience to the conclusion that they cannot successfully unite manual labor of students with school studies, and have therefore rented the farm attachment of the College. We would recommend, however, as a means of giving practical men an opportunity to judge for themselves of the value of this College to their calling, that prizes, both honorary and substantial, be offered to graduates who best pass an examination before a committee of practical men, and that an appeal be made to the Oregon State Agricultural Society, to co-operate with the Grange for that object.

Respectfully submitted,

D. S. K. BUICK,
C. E. MOORE,
JOHN MINTO,
Committee.

The State Grange, at the request of the Faculty, appointed a committee to visit the Agricultural College during the session, and particularly during the final examination of the classes. I beg leave, most respectfully, to request that the Legislature appoint a committee for the same purpose.

EXPERIMENTING.

We are experimenting with grasses, this being both the most desirable department of experimentature for Oregon at present, in our opinion, and also the only one allowed by our means. The Commissioner of Agriculture at Washington desires the agricultural colleges of the several States to undertake a series of "co-operative experiments." These he has indicated, but we have not the means to carry them out.

MANUAL LABOR.

The Faculty of the College have not been able to enforce manual labor as yet. Students, if they labor, must be paid, and there are no funds provided for this purpose.

WORKSHOP.

The Board of Trustees, at its last meeting, appointed a committee to consider the practicability and advisability of establishing a workshop. I have not received the report of this committee.

FUNDS.

The funds of the Agricultural College are in a sound condition, all outstanding warrants being paid, and a surplus left in the treasury. I should like much to get a small addition to this fund, so as to be able to employ another teacher. This would greatly increase our efficiency.

APPARATUS.

We have apparatus for illustration of all the fundamental principles of Chemistry and Natural Philosophy. We hope to add this year a level and seed-testing apparatus.

DONATIONS.

We acknowledge with thanks the following donations:

1. Numerous documents from Commissioner Education.
2. Documents and seeds from Commissioner of Agriculture.
3. Centennial map from Senator Slater.
4. Numerous documents from Hon. John Whiteaker.
5. Maps and volumes from Senator Grover.

6. A series of valuable reports from the Land Office at Washington.

7. A box of wood specimens from Census Office.

8. Botanical specimens from Agricultural Department, Washington, D. C.

9. The *Gazette* from the U. S. Patent Office.

10. We especially acknowledge the courtesy of our State officials and their clerks.