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BIENNIAL REPORT

OF THE

State Agricultural College,

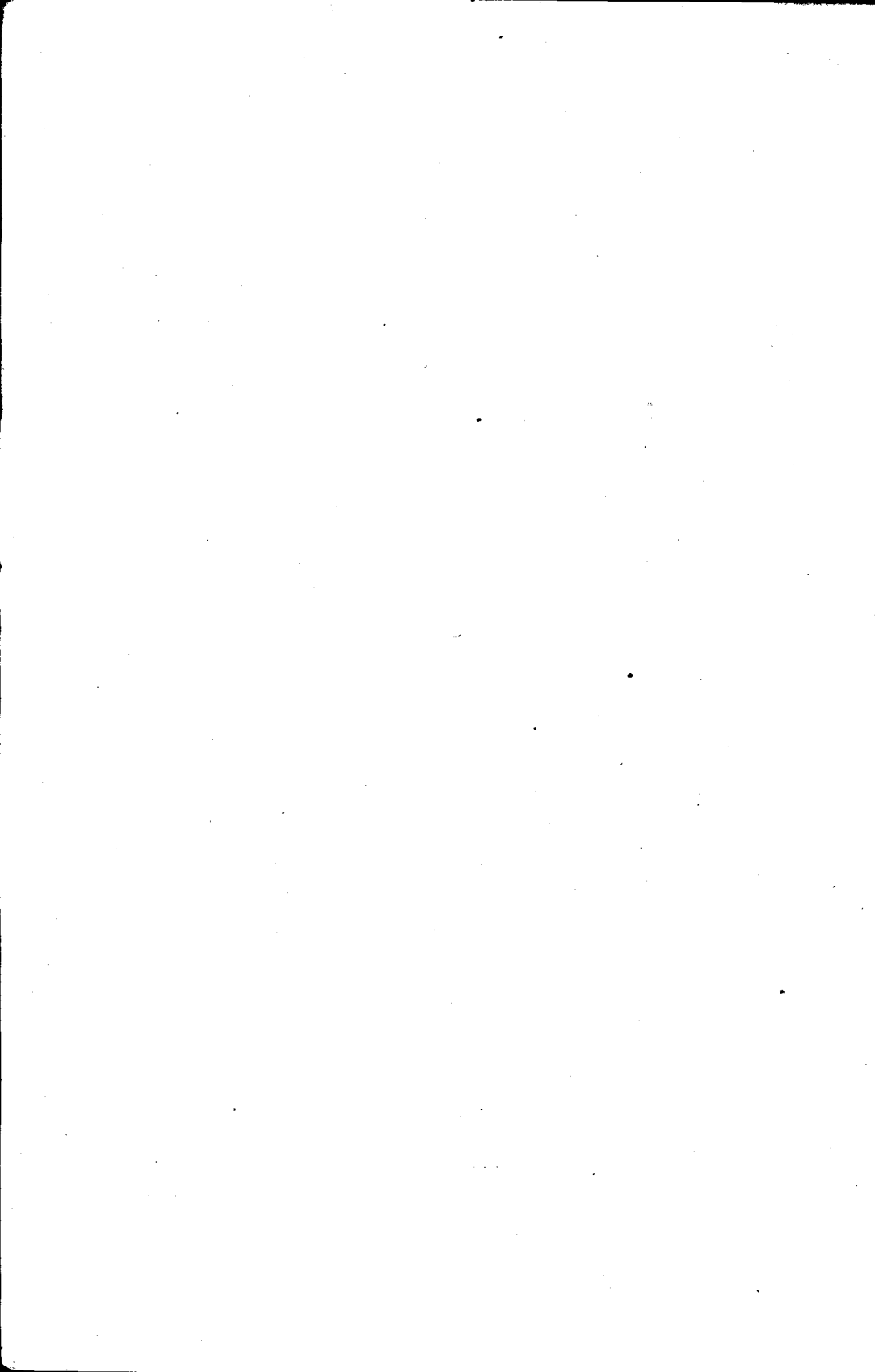
LOCATED AT

DISCARD
CORVALLIS, OREGON

—••—
ELEVENTH REGULAR SESSION—1880.
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SALEM, OREGON:
W. P. KEADY, STATE PRINTER.
1880.



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CALENDAR FOR 1880-1881.



September 1, 1880,	- - - - -	Session begins.
December 1, 1880,	- - - - -	Second Term begins.
March 1, 1881,	- - - - -	Third Term begins.
June 1, 1881,	- - - - -	Commencement Day.

BIENNIAL REPORT.

To His Excellency, Gov. Thayer, Salem, Oregon :

SIR:—I have the honor to submit the fourth annual report of the Agricultural College.

The last Legislature made an important change in the condition of this institution. Previously the college had been supported chiefly by an annual appropriation of five thousand dollars ; this was cut off by the last legislature, and the college was thrown upon the interest of the Agricultural College Land Fund for its support. The uncertain condition of this fund as to amount and availability, rendered it doubtful whether the institution could be sustained or not ; but by rescinding every expenditure beyond such as were absolutely necessary to keep the school alive, we have succeeded in keeping clear of debt and are pleased to say that our July interest, has paid all outstanding warrants and left a handsome surplus in the treasury ; and as matters now stand, if the legislature would give us some twelve hundred dollars a year we could add it to this surplus and employ an additional professor, and this would greatly increase the efficiency of the school. I desire some change in the manner of appointing students to the college. It is best to permit the faculty to appoint a certain number from each county and not trouble the senators with the matter.

The school has been well attended during the last two years, and it is gratifying to say that there have been no cases of discipline.

I give here the course of study adopted by the legislature in 1872.

PREPARATORY CLASSES.

Mathematics—Arithmetic and Algebra.

English—Reading, Spelling, Geography, English Grammar, Penmanship, Composition, Elocution, History of the United States.

Natural Science.—Natural History, Philosophy, Physiology.

Languages.—Latin Grammar, Latin Reader, Greek Reader, Greek Grammar, French Grammar and Reader, German.

Military Exercises.—Tactics, Drill.

Agriculture.—Practical Instruction on the Farm.

FRESHMAN CLASS.

Mathematics—Algebra, Geometry.

English—Rhetoric, Composition, History, Book-keeping.

Natural Science—Inorganic and Organic Chemistry, Qualitative Analysis, Structure and Physiology of Plants, Water, Atmosphere and Soil in their relation to vegetable production, Meteorology, Zoology, Botany, Physical Geography.

Languages—Ancient Geography, Roman Antiquities, Virgil, Cicero, Greek Antiquities, Greek Testament, Homer, French, German.

Agriculture—Theory and Practice of Agriculture, Principles of Tillage, Drainage, Landscape Gardening.

Military—Tactics, Drill.

Excursions—Botanical and Zoological.

SOPHOMORE CLASS.

Mathematics.—Trigonometry, (plane and spherical) Navigation, Mensuration, Surveying, Drawing, Maps of Farms, etc.

English.—Rhetoric, Logic, Composition, Elocution, Book-keeping, Universal History.

Natural Science—Analysis of Minerals, Ores, Soils, Manures, Ashes of Plants, Mineral Waters, etc., etc., Practice in Mineralogy, Entomology, Geology, Botany.

Languages—Roman and Greek Antiquities, Sallust, Horaces' Odes Epodes, Greek Testament, Homer, French, German.

Agriculture.—Theory and Practice of Agriculture, Horticulture, Farm Implements and Drainage, Stock-breeding.

Excursions.—Geological and Botanical.

JUNIOR CLASS.

Moral Philosophy—Evidence of Natural and Revealed Religion, Moral Philosophy, (ethics), Political Economy.

Mathematics.—Analytical Geometry, Differential and Integral Calculus, Practical Surveying and Engineering.

English.—Mental Philosophy, English Literature.

Natural Science.—Qualitative and Quantitative Analysis, Mineralogy, Chemistry, (general), Geology, Organic Analysis.

Languages.—Livy, Horace's Satires, Epistles, etc., Odyssey, De Corona, Latin and Greek Composition, French, German.

Agriculture.—Theory and Practice of Agriculture, Training and Culture of Fruit Trees, the Vine, Small Fruits, Culture of Flowers.

Military.—Tactics and Drill.

SENIOR CLASS.

Moral Philosophy.—Evidence of Natural and Revealed Religion—continued.

Mathematics.—Mechanics, Astronomy, Civil Engineering.

Natural Science.—Chemistry, completed, Quantitative Analysis.

Languages.—Juvenal, Cicero, Tacitus, Alcestis, (Euripides), Thucydides, Demosthenes.

Agriculture.—Theory and Practice of Agriculture, Laying out of lawns, Ornamenting Grounds, etc.

Military.—Tactics, Drill.

From this list of studies we selected and classified such as our teaching force would suggest as most important. We distributed them into schools as follows :

- I. School of Mathematics.
- II. School of Language (ancient).
- III. School of Language (modern).
- IV. School of Chemistry.
- V. School of Natural Philosophy.
- VI. School of Moral Philosophy.
- VII. School of Agriculture.
- VIII. School of History and Literature.

The Special report of each teacher will show how this work is divided among the teachers.

I.—SCHOOL OF CHEMISTRY.

B. L. ARNOLD, TEACHER.

This school has three classes :

- a. General Chemistry.
- b. Analytical Chemistry.
- c. Agricultural Chemistry.

a. GENERAL CHEMISTRY.

Here the student studies :

1. The General Principles of Chemical Physics.
2. History, Properties and Classification of the Elements and their Compounds.
3. The Carbon Compounds.

b. ANALYTICAL CHEMISTRY.

Here the student learns to separate and classify the common metals

according to the method of Elliot & Storer. He then studies the salts by the same method, and lastly, learns to treat the more refractory oxides, and applies his knowledge to agricultural analysis and the identification of ores, &c. Chemical Philosophy is all along taught and the solution of chemical problems forms a prominent feature of the course.

c. AGRICULTURAL CHEMISTRY.

Here the student studies the following subjects :

1. The origin of the various soils, their physical and chemical characters.
 2. Methods of preparation for crops.
 3. The means of preventing the deterioration of soils.
 4. The means used to restore worn soils.
 5. The sources, management and action of manures.
 6. Meteorology in its relation to crops.
 7. The application of crops to feeding.
 8. General farm economy.
-

II.—SCHOOL OF NATURAL PHILOSOPHY.

B. L. ARNOLD, TEACHER.

Here the student applies himself to the subject of matter as effected by force.

The subject includes, Kinematics, Kinetics, Energy, Undulations, Motion and Equilibrium, and the application of the principles here developed to Light, Heat, Electricity, and Sound. These subjects are taught in the light of the principle of Conservation of Energy.

III.—SCHOOL OF MORAL SCIENCE.

B. L. ARNOLD, TEACHER.

This school includes :

1. Logic.
2. Psychology.
3. Mental Philosophy.
4. The Application of the principles of these sciences to Ethics, Rhetoric, Political Economy and Sociology.

All along through the course the subjects are so arranged, that each higher study requires a review of lower principles.

I find that it is necessary to have students study Algebra and Geometry before they enter upon any of the subjects in my departments.

It is highly gratifying to me to state that the students have greatly aided me in discipline by their gentlemanly deportment.

EXPERIMENTS.

So limited have been our means and so uncertain the amount of money which we should receive, that it has been impossible to do any thing beyond giving analysis of experiments. Accordingly, I have afforded the classes in agriculture fine opportunities to study the experiments of Lawes and Gilbert, and many others.

Experimenting to be of any benefit and value must extend over several years; and should there be a regular supply of funds in sufficient amount, we propose to enter upon experiments to test the value of fallowing land, of rotation of crops, to ascertain what grasses and clovers are best suited to Oregon, and other kindred subjects. I call attention to some investigations of Prof. Hawthorne in relation to Lucerne; should his observations be correct, the State will derive immense benefit from his labors in this field.

The subject of fertilizers is an important matter and one that should early occupy the attention of our farmers. So far as I have traveled along the sea coast, I have made observations to ascertain the extent of marl in the State, at least on the sea coast of the State, and I find that there is marl of excellent quality and in some quantity which will be of great value, as soon as there shall be railroad communication with the coast.

THE MECHANICAL DEPARTMENT.

We are making arrangements to open this department at an early day, and have a young man preparing to take charge of it. We fully recognize its importance. Very respectfully,

B. L. ARNOLD.

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, Mechanics and Astronomy.

Special attention is given to the mental development of the student, and the discipline of his intellectual 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. Lectures are given on the history of Mathematics, and the two methods of reasoning, analytical and synthetical, explained.

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

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

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

SCHOOL OF AGRICULTURE

Zoology and stock-breeding. I delivered a course of lectures, extending through the entire year, on Domestic Animals ; their Origin, Utility, Methods of Improving and Taking Care of Stock, etc. etc.

These lectures were attended by all the agricultural students in the Collegiate Department.

CABINET.

A large number of geological and mineralogical specimens have

been added to our Cabinet during the last two years, greatly facilitating class-room work in this department.

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

July 28th, 1880.

JOSEPH EMERY.

BOTANY, FRUIT CULTURE, AND LANGUAGES.

B. J. HAWTHORNE, TEACHER.

President B. L. Arnold:

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

Botany has been taught by means of text-books and lectures. For illustration, Oregon plants, as far as possible, are brought before the classes. The students are urged to become familiar with the plants of our own State—those by which they are continually surrounded.

All the information on grasses, that can be had, is used. Which grass is best adapted to a given locality; which is most nutritious; which is best for grazing; which for hay. Some experiments have been made in order to ascertain whether any grass will remain green in the Willamette valley, throughout the entire summer and fall. Thus far, Alfalfa (Lucerne, Medicago Sativa) has stood the test. It is as green in midsummer as it is in May. In good rich loam it grows five feet high, and it will stand several mowings during one season. The fodder is of a good quality for stock. Provision has been made for more extensive experiments with grasses during the following year.

The different kinds of wheat, oats, and corn will be tested.

Text Books: Gray's series.

From studying the general principles and habits of plants, we pass to the special subject of

FRUIT CULTURE.

Methods of producing, cultivating, and preserving fruit trees now engage our attention. Which fruits are best adapted to our State? How can they be made most profitable? Shall we raise all wheat and no fruit? These are some of the questions arising.

It is proposed to have each member of the class practice grafting, budding, cross-breeding, transplanting, and pruning, and observe the results. If a tree begins to decline, try to learn the cause and apply the remedy.

Text Book: Downing's Selected Fruits.

SCHOOL OF LANGUAGE.

This school is divided into two departments :

A.—Ancient Language.

B.—Modern Language.

LATIN.

Introductory Class.—Grammar, Reader, Exercise-book.

Junior.—Cæsar, Virgil, Cicero de Senectute, Exercises.

Intermediate.—Horace, Livy, Cicero's Orations, Exercises.

Senior.—Cicero de Officiis, Persius, Tacitus, Exercises.

GREEK.

Introductory.—Grammar, Xenophon.

Junior.—Herodotus, Xenophon.

Intermediate.—Demosthenes, Plato, Homer, Exercises.

Senior.—Thucydides, Sophocles, Exercises.

Grammar, Greek.—Goodwin's Liddell and Scott's Lexicon.

Latin.—Gildersleeve's Grammar and Exercise-book. Freund's Lev-
erett's Lexicon.

Graduation in Latin is necessary for B. S.

Graduation in Latin and Greek is necessary for A. B.

B—MODERN LANGUAGE.

This course comprehends French, German, and Anglo-Saxon.

1. *German.*—Whitney's Grammar and Reader; besides the Reader, such authors and parts of authors will be read as the teacher may deem fit.

2. *French.*—DeVere's Grammars and Readers; besides Readers, such authors and parts of authors will be read as the teacher may deem fit.

3. *Anglo-Saxon.*—Grammar, March; Reader, March; Corson's Hand-book.

Graduation in German and Anglo-Saxon is required for the degree of A. M., in addition to graduation in the Ancient Languages.

SCHOOL OF HISTORY AND LITERATURE.

1. *History.*—History, of Greece, of Rome, of England, of the United States.

2. *Literature.*—History of the English Language and Literature; English Grammar; a portion of Æsthetics; Anglo-Saxon form of Literature.

Text-Books.—Smith's Smaller Histories of Greece and Rome; Smith's Student's Gibbon's Decline and Fall, and the Student's Hume's History of England, by the same author; Taylor's Mannel of Modern History.

Text-Books in Literature.—Kame's Criticism; Brown's English Grammar; Hart's English Literature and American Literature; Shakespeare; Corson's Hand-book of Early English; Sprague's English Literature; Whitney's English Grammar, Life and Growth of Language.

Very respectfully,

B. J. HAWTHORNE.

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. Ison, 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 Canthorn, 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.

*Deceased.

LIST OF STUDENTS.

Following is the list of students. The most of them attended the whole of the last two years:

Morris Allen.	Thomas L. Charman.
William W. Baker.	Albert E. Cook.
William B. Bell.	Orville Cone.
Charles L. Bennett.	William D. Casteel.
E. H. Bennett.	Virgil A. Davis.
William L. Bradshaw.	T. H. Davis.
Vineyard C. Brock.	John Davis.
Andrew S. Buchanan.	William Davis.
William A. Buchanan.	Edwin L. Davis.
Alonzo Carlile.	George R. Dedman.
Orville E. Carter.	George F. Eglin.
J. Luther Caton.	Dayton Elliott.
Arthur J. Chapman.	Marion Elliott.
E. Elmer Charman.	William G. Emery.

James Ferguson.
Edgar Grimm.
Henry G. Hastings.
Thomas J. Henkle.
A. T. Hershner.
Arthur E. Holgate.
William Holman.
George Hovenden.
Baxter F. Howard.
Jefferson D. Howard.
Leroy Humphreys.
Ira Hunter.
Charles Horning.
John Jenkins.
Benjamin R. Job.
J. P. Johnson.
George Klaggett.
Charles L. Lambert.
Plutarch Lewis.
George Lily.
Isaac Looney.
W. York Masters.
Shubel G. McCann.
James A. McFadden.
Alfred Matthieu.
E. M. Mays.
Albert Mercer.
John F. Montgomery.
Harry McConnell.
Edwin Newton.

David A. Osburn.
Henry Owens.
Franklin Priest.
William W. Randall.
Michael Rickard.
William Rickard.
A. Harding Roberts.
William Robnett.
George W. Simpson.
Bartholomew T. Soden.
Jessee D. Stearns.
Leo Stock.
Richard Taylor.
Colinbus M. Tetherow.
Ferdinand Tracy.
James Trafzer.
Aaron Vinson.
John Walker.
B. F. Watkins.
R. A. Williamson.
J. H. Wilson.
James O. Wilson.
John W. Will.
Hiram A. Wood.
Charles L. Wood.
Samuel M. Wood.
Jasper N. Wood.
Ernest White.
Fred L. Wright.
William E. Yates.

Total. 88.

WEATHER RECORD.

STATE AGRICULTURAL COLLEGE,

CORVALLIS, OREGON. }

Latitude, about 44 deg. 33 min. Longitude, about 123 deg. 15 min.

Monthly Record of Temperature and Rainfall for the Year 1879.

THERMOMETER.				Rainfall inches.
MONTH.	Maximum.	Minimum.	Mean.	
January.....	46	19	32.5	2.00
February.....	52	25	33.5	5.92
March.....	66	32	49.0	7.31
April.....	67	32	49.5	2.40
May.....	72	33	54.0	4.38
June.....	73	42	57.5	.14
July.....	90	47	68.5	.50
August.....	83	48	65.5	1.00
September.....	84	41	63.0	1.50
October.....	64	32	48.0	2.00
November.....	55	22	38.0	4.75
December.....	56	8	32.0	4.50

Hottest day, July 26th—90 deg.

Coldest, December 23d—8 deg.

Rainfall for the year—36.40 inches.