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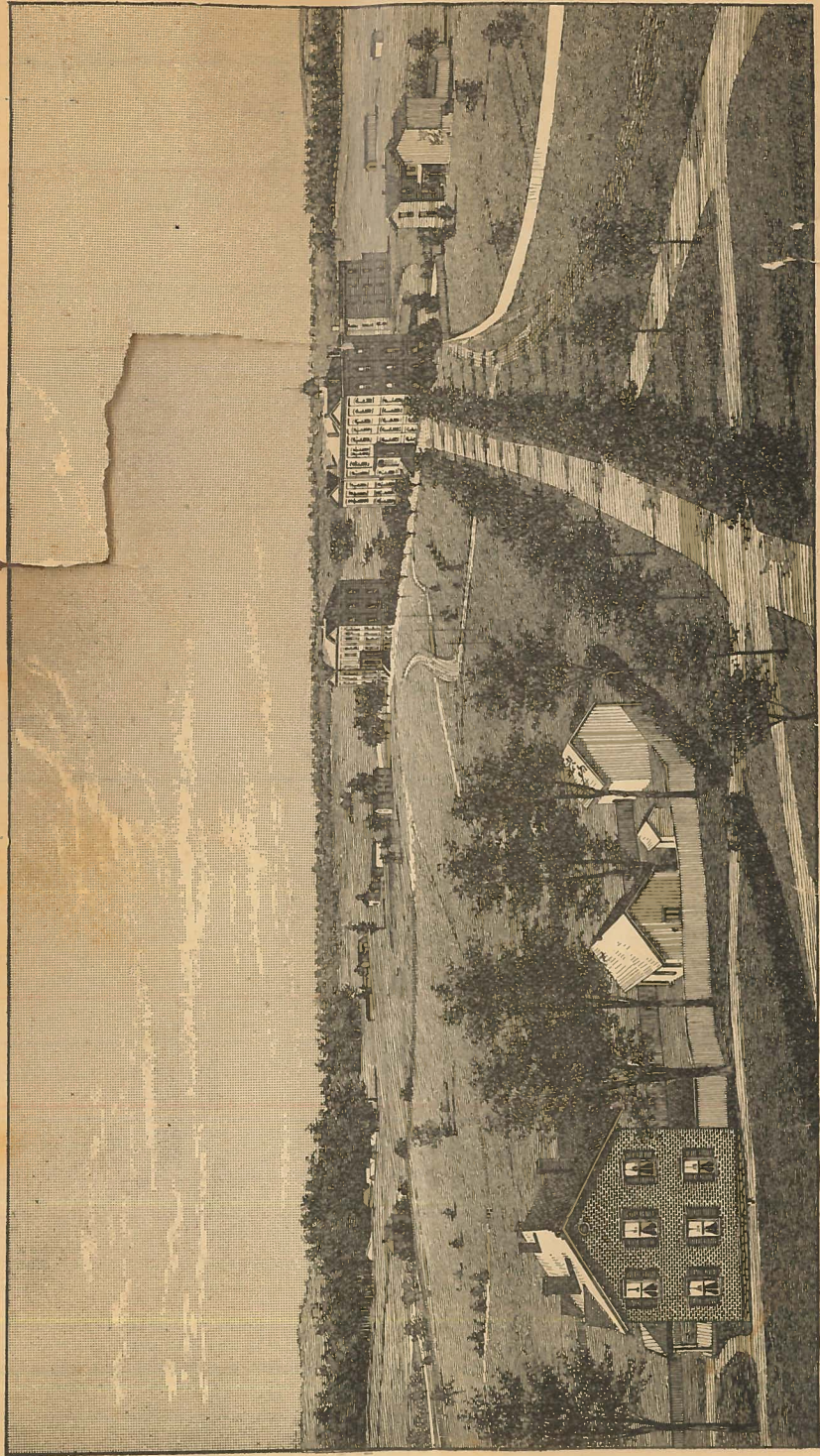
Russell Davis
V. A. & M. Co.
Blacksburg
Va

Virginia

Agricultural and Mechanical
College.

1891-'92.

Russell Davis
Va. A. & M. College
Blacksburg
Virginia



BIRD'S-EYE VIEW OF GROUNDS AND BUILDINGS.

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CATALOGUE

OF

The Virginia Agricultural and
Mechanical College.

1891-'92.

BLACKSBURG, VIRGINIA.

RICHMOND, VA.:
EVERETT WADDEY CO., PUBLISHERS AND PRINTERS.
1892.

CALENDAR

SESSION OF 1891-'92.

1891.

First Term begins Monday, September 21.
Christmas Holidays begin Thursday, December 24.

1892.

Christmas Holidays end Sunday, January 3.
Intermediate Examinations end Monday, February 1.
Second Term begins Tuesday, February 2.
Final Examinations end Friday, June 17.
Baccalaureate Sermon Sunday, June 19, 11 A. M.
Sermon before Young Men's Christian Asso'n. Sunday, June 19, 8 P. M.
Address before Literary Society Monday, June 20, 11 A. M.
Celebration of Lee Literary Society Monday, June 20, 8 P. M.
Alumni Address Tuesday, June 21, 11 A. M.
Celebration of Maury Literary Society Tuesday, June 21, 8 P. M.
Commencement Day Wednesday, June 22.

Next Session (1892-'93) begins Wednesday, September 21, 1892.

BOARD OF VISITORS.

RECTOR.

C. E. VAWTER, Crozet, Albemarle Co.
(Term expires January 1st, 1894.)

HON. JOHN E. MASSEY, Superintendent
of Public Instruction (*ex officio*) Richmond, Henrico Co.
H. L. CARTER, Richmond, Henrico Co.
A. R. VENABLE, JR., Farmville, Prince Edward Co.
J. M. CLOYD, Dublin, Pulaski Co.
(Terms expire January 1st, 1894.)
J. M. BARTON, Kernstown, Frederick Co.
J. THOMPSON BROWN, Brierfield, Bedford Co.
T. B. FITZGERALD, Danville, Pittsylvania Co.
F. M. PAYNE, Newport, Giles Co.
(Terms expire January 1st, 1896.)

SECRETARY OF THE BOARD.

C. T. JORDAN, Crozet, Albemarle Co.

EXECUTIVE COMMITTEE.

C. E. VAWTER, Chairman, Crozet, Albemarle Co.
J. THOMPSON BROWN, Brierfield, Bedford Co.
A. R. VENABLE, Farmville, Prince Edward Co.
J. M. McBRYDE, President of the College
(*ex officio*), Blacksburg, Montgomery Co.

FACULTY AND OFFICERS.

JOHN M. MCBRYDE, PH. D., LL. D.,
President and Professor of Agricultural Chemistry.

JOHN E. CHRISTIAN, A. M.,
Professor of Mathematics and Civil Engineering.

JAMES H. FITTS (Annapolis),
Professor of Mechanical Engineering.

WILLIAM B. ALWOOD,
Professor of Horticulture, Entomology and Mycology.

EDWARD E. SHEIB, PH. D. (Leipsic),
Professor of English, History and Political Economy.

ELLISON A. SMYTH, JR., A. M.,
Professor of Biology.

THEO. P. CAMPBELL, A. M.,
Adjunct Professor of Modern Languages.

WILLIAM E. ANDERSON,
Adjunct Prof. of Physics and Electrical Engineering, and Director of Shops.

ROBERT C. PRICE,
Adjunct Professor of General Chemistry, Mineralogy and Geology.

D. O. NOURSE, B. S.,
Adjunct Professor of Agriculture.

JOHN A. HARMAN (2d Lieut. 7th U. S. Cavalry),
Assistant Professor of Mathematics, Professor of Military Science and Tactics, and Commandant of Cadets.

ROBERT J. DAVIDSON, A. M.,
Adjunct Professor of Analytical Chemistry.

E. P. NILES, D. V. M.,
Adjunct Professor of Veterinary Science.

R. T. BRAY, MECH. E.,
Instructor in Wood Work.

W. N. CUNNINGHAM,
Instructor in Iron Work.

W. W. HURT,
Instructor in Mathematics and Book-keeping.

HON. JOHN GARDNER,
Treasurer.

W. W. HURT,
Secretary of Faculty.

ALFRED W. DRINKARD,
Librarian.

KENT BLACK, M. D., AND W. F. HENDERSON, M. D.,
College Physicians.

REV. G. T. GRAY, REV. R. H. WILSON AND REV. C. N. A. YONCE,
Chaplains.

STUDENTS OF SESSION OF 1891-'92.

GRADUATE STUDENTS.

NAME.	POST-OFFICE.	COUNTY.
MCBRYDE, CHARLES N.,	Blacksburg,	Montgomery.
(B. S., University of South Carolina.)		
MURRILL, ASHBY,	Blacksburg,	Montgomery.
PRICE, ROBERT H.,	Blacksburg,	Montgomery.
WATSON, THOMAS L.,	Chatham,	Pittsylvania.

UNDER-GRADUATE STUDENTS.

Seniors.

CONNER, GEORGE W.,	Max Meadows,	Wythe.
CONNER, WILLIAM G.,	Max Meadows,	Wythe.
MASSIE, JOSEPH A.,	Gaines' Cross Roads,	Rappahannock.
PORCHER, C. GADSDEN,	Eutawville,	Berkeley Co., S. C.

Juniors.

COX, T. BRANSFORD,	Manchester,	Chesterfield.
DRINKARD, ALFRED W.,	Mt. Athos,	Campbell.
FINCH, ADAM T.,	Boydton,	Mecklenburg.
FRITH, WILLIAM O.,	Sydnorsville,	Franklin.
MINER, EDWARD P.,	Suffolk,	Nansemond.
MINOR, WILLIAM H.,	Charlottesville,	Albemarle.
OSBORNE, JAMES W.,	Charlotte,	Mecklenburg County, N. C.
STULL, JOHN W.,	Rich Patch,	Alleghany.
WRIGHT, JOSEPH,	Pullens,	Pittsylvania.
WRIGHT, ROBERT E.,	Rexburg,	Essex.

Sophomores.

CROXTON, LEWIS,	Manquin,	King William.
DACHENHAUSAN, ALEX. VON,	Washington,	District of Columbia.
EAKIN, BYRON W.,	Blacksburg,	Montgomery.
ELLET, WALTER B.,	Christiansburg,	Montgomery.
ESKRIDGE, ALLEN T.,	Christiansburg,	Montgomery.
GORMLEY, H. S.,	Charlotte,	Mecklenburg County, N. C.
GREEN, ASHBY B.,	West Point,	King William.
HARVEY, URBAN,	Washington,	District of Columbia.
HUBBERT, HENRY S.,	Blacksburg,	Montgomery.

JERRELL, LESLIE W.,	Brokenburg,	Spotsylvania.
KNIBB, JOSHUA R.,	Cardwell,	Goochland.
LEWTON, THEODORE G.,	De Land,	Florida.
LOVENSTEIN, S. VANCE,	Richmond,	Henrico.
OSBORNE, PATRICK H.,	Keysville,	Charlotte.
PALMER, ARTHUR H.,	Roanoke,	Roanoke.
PAYNE, WILLIAM A.,	Chatham,	Pittsylvania.
PRATT, HENRY B.,	New York City,	New York.
QUIMBY, E. M. C.,	Suffolk,	Nansemond.
WHITE, JOSHUA W.,	Eureka Mills,	Charlotte.
WHITEHEAD, LANGHORNE,	Chatham,	Pittsylvania.
WHITTLE, RICHARD P.,	Norfolk,	Norfolk.
WILSON, FRANK D.,	Chatham,	Pittsylvania.
WRIGHT, ROBERT L.,	Castleton,	Rappahannock.

Freshmen.

ANDERSON, CLIFFORD W.,	Richmond,	Henrico.
BARTON, WILLIAM E.,	Alexandria,	Alexandria.
BEVERLY, EDWARD P.,	Broad Run,	Fauquier.
BEVERLY, ROBERT, JR.,	Broad Run,	Fauquier.
BLACKMORE, JOHN A.,	Hampton,	Elizabeth City.
BOOZE, GEORGE W.,	Springwood,	Botetourt.
BROCE, WILLIAM E.,	Blacksburg,	Montgomery.
BROWNE, FLETCHER,	Accomac,	Accomac.
BUDD, WILLIAM,	Petersburg,	Dinwiddie.
BUTLER WILLIAM S.,	Lowmoor,	Alleghany.
CAMERON, ANDREW W.,	Deerfield,	Augusta.
CARPER, JOSEPH B.,	Gala,	Botetourt.
CONWAY, ALFRED T.,	Blacksburg,	Montgomery.
COWARDIN, ROBERT W.,	Richmond,	Henrico.
DAVIS, THOMAS R.,	Raccoon Ford,	Culpeper.
DENOON, HUGH,	Richmond,	Henrico.
DILLARD, FRANK B.,	Salem,	Roanoke.
EDMONDSON, EUGENE B.,	Charleston,	Kanawha County, W. Va.
GLENN, EMANUEL G.,	South Boston,	Halifax.
GRAHAM, JOHN W.,	Belfast Mills,	Russell.
GUIGNARD, CHRISTOPHER G.,	Springfield,	Aiken County, S. C.
GUNST, SAMUEL,	Richmond,	Henrico.
HALE, JOHN S.,	Callaway's,	Franklin.
HALE, LORENZO M.,	Blacksburg,	Montgomery.
HARLESS, ISAAC B. B.,	Long's Shop,	Montgomery.
HURT, HARRY A.,	Rocky Mount,	Franklin.
JORDAN, NOBLE M.,	Michaux,	Powhatan.
KINZER, JOHN M.,	Blacksburg,	Montgomery.

KIPPS, JOSEPH M.,	Blacksburg,	Montgomery.
KLINE, LESLIE D.,	Vaucluse,	Frederick.
KOONTZ, C. E.,	Verbena,	Page.
KOONTZ, WILMER F.,	Alma,	Page.
LANCASTER, LESLIE H.,	Blacksburg,	Montgomery.
LINKOUS, HOUSTON M.,	Blacksburg,	Montgomery.
MOORE, ROBERT E.,	Roanoke,	Roanoke.
MURRILL, HOWARD A.,	Blacksburg,	Montgomery.
NEWLEE, JOHN,	Blacksburg,	Montgomery.
PERRY, WARREN A.,	Wileysburg,	Charlotte.
PRESTON, JOHN L.,	Rapidan,	Culpeper.
PRICE, JAMES G.,	Blacksburg,	Montgomery.
PUGH, HARRY,	Blacksburg,	Montgomery.
REINACH, SAMUEL A.,	Petersburg,	Dinwiddie.
ROOP, REDMOND I.,	Childress,	Montgomery.
ROSSER, WALTER C.,	Rustburg,	Campbell.
SAMPLE, JOHN W.,	Charlotte,	Mecklenburg Co., N. C.
SLUSSER, WALTER B.,	Blacksburg,	Montgomery.
SMITHER, FREDERICK W.,	Richmond,	Henrico.
ST. CLAIR, JOSEPH,	Coyner's Springs,	Botetourt.
STEEL, JOHN W.,	Petersburg,	Dinwiddie.
STUART, ROBERT C.,	Rural Retreat,	Wythe.
SWAN, E. D.,	Richmond,	Henrico.
TATUM, CLAUDIUS N.,	Madison Mills,	Madison.
THOMPSON, WILLIAM C.,	Burk's Garden,	Tazewell.
TIMBERLAKE, WILLIAM H.,	Studley,	Henrico.
TOMS, ZACH,	Norfolk,	Norfolk.
TROUT, JOSEPH O.,	Long Glade,	Augusta.
WALSH, JAMES A.,	Richmond,	Henrico.
WARE, HARRY H.,	Ware's Wharf,	Essex.
WHEELER, CHARLES A.,	High Rock,	Wythe.

SPECIAL STUDENTS.

APPERSON, ALFRED H.,	Marion,	Smyth.
BLACK, JOHN L.,	Stewart's Draft,	Augusta.
CLAY, ANDREW J.,	Burton's Creek,	Campbell.
CROCKETT, THOMAS B.,	Wytheville,	Wythe.
CREWS, ROBERT N.,	News Ferry,	Halifax.
DODD, WILLIAM E.,	Clayton,	Johnston Co., N. C.
HUGHES, EDWIN B.,	Sweet Springs,	Monroe Co., West Va.
JOHNSON, WILLIAM D.,	Marion,	Marion Co., S. C.
MORTON, DAVID F.,	Eureka Mills,	Charlotte.
PORTLOCK, CLYDE W.,	Knoxville,	Knox Co., Tenn.
ROOP, FRANK S.,	Childress,	Montgomery.

SMITH, FRENCH A.,	Marion,	Marion Co., S. C.
SMYTH, ROBERT A.,	Charleston,	South Carolina.
STRAUSS, JOHN F.,	Pulaski City,	Pulaski.
TARRY, GEORGE,	Tarry's Mills,	Mecklenburg.
WADDY, WOODSON P.,	Richmond,	Henrico.

RECAPITULATION.

Graduate students,	4
Under-graduate students:	
Seniors,	4
Juniors,	10
Sophomores,	23
Freshmen,	59
	— 96
Special students,	16
	— 116
Total,	116

Those that have mark /
are back again

Those marked x left before
School closed

GENERAL STATEMENT.

In 1862 Congress donated to the several States large bodies of the public lands for the endowment of Colleges giving special prominence to instruction in Agriculture and the Mechanic Arts.

This grant was accepted by the General Assembly of Virginia in 1872, and the VIRGINIA AGRICULTURAL AND MECHANICAL COLLEGE was opened to students in the fall of the same year.

In 1887 Congress gave to each State \$15,000 annually for the establishment and support of an Agricultural Experiment Station. In 1888 the Station was made, by act of Assembly, a department of the College.

In 1890 the College was allowed two-thirds of the additional amount annually appropriated by Congress to each State for the further endowment of its Land Grant College.

The sciences, especially those related to Agriculture and the Mechanic Arts, hold at this College, in strict accordance with the acts of Congress from which it derives its income, the foremost place. Large provision is made for instruction in their principles and applications to the industries of life.

In order to meet the wants of different classes of students, nine distinct courses of study are offered—seven courses of four years each, leading to the degree of Bachelor of Science, and two shorter courses for certificates. All are grouped under the two general heads of **Agricultural** and **Mechanical**. Under the first head are included the degree courses of Agriculture, Horticulture and Applied Chemistry and the shorter course of Practical Agriculture; under the second, the degree courses of Civil Engineering, Mechanical Engineering, Electrical Engineering and General Science, and the shorter course of Practical Mechanics. The first or Freshman years of all the courses are very nearly the same, and include the fundamental studies—Mathematics, History and

English, as well as Physiology and Book-keeping. The courses begin to diverge in the Sophomore year and the differentiation is complete in the Junior year.

Every course includes a certain element of general or liberal culture in addition to the special or technical studies appropriate to it; the aim being to give the student a practical as well as theoretical knowledge of the sciences related to the profession or pursuit he proposes to follow, and at the same time to fit him intelligently to discharge the duties of citizenship. To this end he is made to study the constitutional history of his country and the general questions affecting its material interests, and is taught the correct and ready use of his mother tongue. The general or liberal studies required in every degree course are Mathematics, English, French, German, General and Constitutional History, Psychology, Political Economy and Ethics.

A course of preparatory or sub-collegiate study, covering one year, has been arranged for applicants unable to meet the requirements for admission to the Freshman class.

The method of instruction adopted combines theory with practice. Laboratory or practical work is required in every department. In English and Modern Languages compositions and other written exercises are required; in Physics, Chemistry, Mineralogy, Mycology, Botany, Zoology and Physiology, laboratory work; in the different branches of Engineering, shop or field work and mechanical drawing; in Agriculture and Horticulture, shop and field work; in Veterinary Medicine, dissecting and clinics. Such practical work is intended to illustrate, emphasize and apply the principles and theories propounded in the lecture room.

The drills and other military exercises required in every course, in connection with the shop and field work, develop the bodily powers of the student and greatly contribute to his physical well-being.

The courses of study are so arranged as to give the student sixteen hours of class work or recitation, and fifteen hours of laboratory, shop or field work, a week. The lecture or recitation con-

tinues one hour; the exercises or work in the laboratory, shop or field, three hours.

All required work in the shop or field is held to be instructive and is not paid for. The College provides, as far as its means permit, unproductive work or manual labor for students needing pecuniary assistance. Such work is paid for at rates proportioned to the value of the labor performed. By our schedule of lectures a student has at his own disposal about fifteen hours a week, which he can, if he chooses, devote to such labor. It is possible for an industrious student to earn from \$2 to \$4 per month or \$25 to \$40 during the session.

COURSES OF STUDY.

A. Regular courses for degree of BACHELOR OF SCIENCE (B. S.). Four years each.

I.—Agricultural Courses.

These courses have the following studies in common: Mathematics, Surveying, Book-keeping, English, Modern Languages, General and Constitutional History, Mental and Moral Science, Political Economy, General and Analytical Chemistry, Physics, Botany, Physiology, Shop and Field Work, Military Tactics, etc.

1. COURSE OF AGRICULTURE.

(The figure after each study denotes the number of hours assigned to it weekly.)

Freshman Year.—History (2) 1st term, 1st Agriculture (2) 2d term; Physiology (3) 1st term, Book-keeping (3) 2d term; 1st English (5); 1st Mathematics (6); Military Science and Tactics (4); Wood Work (9); Field Work (6).

Sophomore Year.—2d Agriculture (2) 1st term, Surveying (2) 2d term; Structural Botany (2) 1st term, Systematic Botany (4) 2d term; Physics (3); Inorganic Chemistry (3); 2d English (3); 2d Mathematics, A (3); Military Science and Tactics (4); Machine Work (9); Field Work (6).

Junior Year.—3d Agriculture (3) 1st term, Pomology (3) 2d term; General Horticulture (2) 1st term, Zoology (2) 2d term; Organic Chemistry (2); 1st Veterinary Science (3); Constitutional History (3) 1st term, Psychology (3) 2d term; 1st French (3); Military Science and Tactics (4); Qualitative Analysis (9); Field Work (6).

Senior Year.—Mycology (2) 1st term, 4th Agriculture (2) 2d term; Agricultural Chemistry (3); Landscape Gardening (1) 1st term, Entomology (2) 1st term, Vegetable Physiology (3) 2d

term; 2d Veterinary Science (2); Political Economy (3) 1st term, Ethics (3) 2d term; 1st German, A (3); Military Science and Tactics (4); Quantitative Analysis (9); Field Practice (6) 1st term, Laboratory Mycology (6) 2d term.

2. COURSE OF HORTICULTURE.

Freshman, Sophomore and Junior Years same as in preceding course.

Senior Year.—Mycology (2) 1st term, Economic Zoology (2) 2d term; Agricultural Chemistry (3); Landscape Gardening (1) 1st term, Entomology (2) 1st term, Vegetable Physiology (3) 2d term; 2d Veterinary Science (2); Political Economy (3) 1st term, Ethics (3) 2d term; 1st German, A (3); Military Science and Tactics (4); Quantitative Analysis (15) 1st term, Laboratory Mycology (6) 2d term, Laboratory Horticulture (9) 2d term.

3. COURSE OF APPLIED CHEMISTRY.

Freshman and Sophomore Years same as in Course of Agriculture.

Junior Year.—Organic Chemistry (2); Metallurgy (3) 1st term, 1st Industrial Chemistry (3) 2d term; Mineralogy (3); Electricity (2); 1st French (3); Constitutional History (3) 1st term, Psychology (3) 2d term; Military Science and Tactics (4); Qualitative Analysis (15) 1st term, Quantitative Analysis (15) 2d term.

Senior Year.—2d Industrial Chemistry (2); Agricultural Chemistry (3); Geology (2); Political Economy (3) 1st term, Ethics (3) 2d term; 2d French, A (3); 1st German, A (3); Military Science and Tactics (4); Organic Analysis, etc.; (15) 1st term, Assaying (15) 2d term.

II.—Mechanical Courses.

These courses have the following studies in common: Mathematics, Surveying, Descriptive Geometry, Mechanics, Book-keeping, Physiography, English, Modern Languages, General and Constitutional History, Mental and Moral Science, Political

Economy, General Chemistry, Physics, Geology, Physiology, Mechanical Drawing, Shop and Field Work, Military Tactics, etc.

4. COURSE OF CIVIL ENGINEERING.

Freshman Year.—First Mathematics (6); History (2) 1st term, Physiography (2) 2d term; Physiology (3) 1st term, Book-keeping (3) 2d term; 1st English (5); Military Science and Tactics (4); Wood Work (9); Mechanical Drawing (6).

Sophomore Year.—2d Mathematics, A (3); 2d Mathematics, B (2); Descriptive Geometry (2) 1st term, Surveying (2) 2d term; Physics (3); Inorganic Chemistry (3); 2d English (3); Military Science and Tactics (4); Machine Work (9); Mechanical Drawing (6).

Junior Year.—Geodesy (3); 3d Mathematics (3); 2d Electricity (2); Mechanics (2); Constitutional History (3) 1st term, Psychology (3) 2d term; 1st French (3); Military Science and Tactics (4); Field Practice (9); Mechanical Drawing (6).

Senior Year.—Civil Engineering (3); Thermodynamics (3); Astronomy (2); Geology (2); Political Economy (3) 1st term, Ethics (3) 2d term; 1st German, A (3); Military Science and Tactics (4); Field Practice (9); Civil Engineering Drawing (6).

5. COURSE OF MECHANICAL ENGINEERING.

Freshman and Sophomore Years same as in Course of Civil Engineering, except 1st Electricity in place of Surveying in 2d term of Sophomore year.

Junior Year.—Mechanics (2); Principles of Mechanism (3) 1st term, 1st Applied Mechanics (3) 2d term; 2d Electricity (2); 3d Mathematics (3); Constitutional History (3) 1st term, Psychology (3) 2d term; 1st French (3); Military Science and Tactics (4); Laboratory Physics (9) 1st term, Machine Work (9) 2d term; Mechanical Drawing (6).

Senior Year.—2d Applied Mechanics (3) 1st term, Designing (3) 2d term; Thermodynamics (3); 2d Industrial Chemistry (2); Geology (2); Political Economy (3) 1st term, Ethics (3) 2d term; 1st German, A (3); Military Science and Tactics (4); Machine Work (9); Mechanical Engineering Drawing (6).

6. COURSE OF ELECTRICAL ENGINEERING.

Freshman and Sophomore Years same as in Course of Civil Engineering, except 1st Electricity instead of Surveying in 2d term of Sophomore year.

Junior Year.—Mechanics (2); Principles of Mechanism (3) 1st term, 1st Applied Mechanics (3) 2d term; 2d Electricity (2); 3d Mathematics (3); Constitutional History (3) 1st term, Psychology (3) 2d term; 1st French (3); Military Science and Tactics (4); Laboratory Physics (9); Qualitative Analysis (6).

Senior Year.—Electrical Engineering (3); Thermodynamics (3); 2d Industrial Chemistry (2); Geology (2); Political Economy (3) 1st term, Ethics (3) 2d term; 1st German, A (3); Military Science and Tactics (4); Laboratory Electricity (9); Electrical Engineering Drawing (6).

7. COURSE OF GENERAL SCIENCE.

Freshman Year same as in Course of Civil Engineering.

Sophomore Year.—2d Mathematics, A (3); Descriptive Geometry (2) 1st term, Surveying (2) 2d term; Physics (3); Botany (2); Inorganic Chemistry (3); 2d English (3); Military Science and Tactics (4); Machine Work (9); Mechanical Drawing (6).

Junior Year.—3d Mathematics (3); Mechanics (2); Constitutional History (3) 1st term, Psychology (3) 2d term; 1st French (3); 1st German, A (3); 1st German, B (2); Military Science and Tactics (4); Laboratory Physics (9); Qualitative Analysis (6).

Senior Year.—Geology (2); Astronomy (2); Biology (1); Political Economy (3) 1st term, Ethics (3) 2d term; 2d French, A (3); 2d French, B (2); 2d German (3); Military Science and Tactics (4); Qualitative and Quantitative Analysis (15) 1st term, Laboratory, Shop or Field Work (15) 2d term.

B. Special courses for CERTIFICATES. Two years each.

1. COURSE OF PRACTICAL AGRICULTURE.

First Year.—Same as Freshman year of Course of Agriculture, except Farm Work every afternoon (Saturday excepted).

Second Year.—1st and 2d Agriculture (5) 1st term, Surveying (2) 2d term, Pomology (3) 2d term; Inorganic Chemistry (3); Structural Botany (2) 1st term, Systematic Botany (4) 2d term; 1st Veterinary Science (3); Political Economy (3) 1st term, Ethics (3) 2d term; Military Science and Tactics (4); Farm Work every afternoon except Saturday.

2. COURSE OF PRACTICAL MECHANICS.

First Year.—Same as Freshman year of Civil Engineering Course.

Second Year.—Shop work daily, except Saturday, from 8 A. M. to 11 A. M. and from 1 P. M. to 4 P. M.; Military Science and Tactics (4). On Monday, Tuesday, Thursday and Friday nights from 7 P. M. to 9 P. M., Mechanical Drawing (4); Elementary Mechanics (2); Mechanical Technology (2).

Announcement—A Preparatory Course, covering one year of sub-Freshman study, will be offered next session.

SCHEDULE OF LECTURES, ETC.

	8—9	9—10	10—11	11—12	1—4
DAILY	1 Mathematics (B). 1 Mathematics (A).		1 English.		
DAILY, except Saturday			Physics. Mineralogy. 3 Mathematics. 3 Agriculture.* Pomology.†	Mil. Science, etc.	Wood Work. 1 Machine Work. Qual. Analysis. Quant. Analysis. Field Practice. Lab. Physics. 2 Machine Work. Lab. Horticult.†
MONDAY	2 Mathematics (A).	Physiology.* Book-keeping.† 1 Chemistry. Con'l History.* Psychology.† Civil Engineering. Elec. Engineering. 2 App'd Mechanics.	Thermodynamics. Agricul. Chemistry. 2 German.		Organic Anal.* Assaying, etc.† Lab. Electricity.
WEDNESDAY	1 French.	2 App'd Mechanics. 2 French (A). Entomology.* Veg. Physiology.†			
FRIDAY	Pol. Economy.* Ethics †				
TUESDAY	2 English. Chem. Technology. Geodesy.				
THURSDAY	1 Vet. Science. Prin. of Mechanism.*				
SATURDAY	1 App'd Mechanics.† 1 German (A).				
TUESDAY	Same as in preceding group.	1 History.* Physiography.† 1 Agriculture.† 2 Agriculture.* Surveying.† Descrip. Geom'ry.* Horticulture.* Zoology.†	Botany. 2 Mathematics (B). Mechanics. 2 Chemistry.* Mycology.† 4 Agriculture.† 2 French (B).	Optional Classes. Phonography. Botany.† Lab. Physics.* Econ. Zoology.† Astronomy. Indus. Chemistry.	Agri. Practice. Mech. Drawing. Qual. Analysis. Quant. Analysis. Field Work. Lab. Mycology. Civ. Eng. Drawing. Mech. Eng. Drawing. Elect. Eng. Drawing.
THURSDAY		Electricity. 1 German (B). Geology. 2 Vet. Science.			
SATURDAY	Biology.	Mil. Science, etc.			

NOTE.—Prayers daily, except Sunday, at 7:45 A. M.

* First Term only.

† Second Term only.

DEPARTMENTS OF INSTRUCTION.

DEPARTMENT OF AGRICULTURAL CHEMISTRY.

President McBryde.

In this department there is one class :

Agricultural Chemistry.—Plant growth and nutrition ; chemical composition and properties of soils ; chemical composition and nature of manures, natural and artificial ; composition and requirements of field crops ; fertility and soil exhaustion ; constituents of animal body ; animal nutrition ; composition and digestibility of foods ; feeding rations ; chemistry of milk, etc. Instruction by lectures and text-books, together with solution of problems.

Text-books and Works of Reference.—Lloyd's Science of Agriculture, Warrington's Chemistry of the Farm, Storer's Agriculture in Some of its Relations with Chemistry, Liebig's Laws of Husbandry, Bousingault's Rural Economy, Papers of Lawes and Gilbert, etc.

(Class meets three times a week throughout the session.)

DEPARTMENT OF GENERAL CHEMISTRY, MINERALOGY AND GEOLOGY.

Professor Price.

I. **General Chemistry.**—In this branch there are six classes :

INORGANIC CHEMISTRY.—Fundamental principles of the science ; relation of chemistry to physics ; the laws of chemistry (chemical combination by weight and by volume) ; symbols ; the chemical nomenclature ; classification of the elements ; the atomic theory ; phenomena accompanying chemical action ; descriptive chemistry of the elements (non-metals and metals) and their compounds, and their most important applications. Analogies be-

tween properties of substances and between chemical reactions are particularly studied. Regular weekly practice in the solution of problems of a chemical nature is also given.

The lectures are illustrated by experiments and specimens.

Text-book.—Remsen's Inorganic Chemistry—advanced course.

(Class meets three times a week throughout session.)

ORGANIC CHEMISTRY.—Lectures on the most important and best known members of the different classes of carbon compounds ; also, the relations existing between the different classes. Special attention is given to processes of artificial production of these compounds.

Text-book.—Remsen's Organic Chemistry.

(Class meets twice a week throughout the session.)

METALLURGY.—The course in this branch of Chemical Technology includes : Mineralogical and geological occurrence of the ores ; preparation of the ores for smelting ; fuels ; refractory materials ; furnaces ; chemical principles involved in the extraction of the metals ; detailed descriptions of the most useful metals and alloys, and their applications ; alteration of the surfaces of metals.

Text-book.—Metals : Bloxam and Huntington.

(Class meets three times a week during first term.)

FIRST INDUSTRIAL CHEMISTRY.—The study of Chemical Technology is continued in this class, and includes : Products of chemical industry, salts, acids, explosives, bleaching powder, soap, inks ; manufacture of lime, mortars and cements.

Text-book.—Wagner's Chemical Technology.

(Class meets three times a week during second term.)

SECOND INDUSTRIAL CHEMISTRY.—The class completes the study of Chemical Technology, covering the following subjects : Manufacture of glass, earthenware and porcelain ; vinegar ; oils ; paints ; tanning ; dyeing ; calico printing.

Text-book.—Wagner's Chemical Technology.

(Class meets twice a week throughout session.)

ASSAYING.—*Wet Assaying.*—Practice in making rapid assays of ores, of iron, zinc, copper, manganese, etc. *Fire Assaying.*—The assay laboratory is now being arranged for fire assaying. It will be provided with crucible furnaces and furnaces for scorification and cupellation, and all reagents and appliances required by the assayer. Special attention will be given to the methods of assaying gold, silver and lead ores.

Text-book.—Notes on Assaying—Ricketts.

(Class meets five times a week during second term, spending three hours at each meeting in the laboratory.)

II. Mineralogy and Geology.—In this branch there are two classes :

MINERALOGY.—Lectures on the chemical and physical properties of minerals and crystallography. These are followed by practical work in Determinative Mineralogy.

Text-books.—Dana's Manual of Mineralogy and Lithology; Erin's Mineralogy, simplified.

(Class meets three times a week throughout session.)

GEOLOGY.—*Dynamical, Structural and Historical Geology.*—Special attention is given to the occurrence and origin of mineral veins, coal, natural gas, and petroleum.

Text-book.—LeConte's Elements of Geology.

(Class meets twice a week throughout session.)

Laboratory and Equipment.—This department occupies two large, well-ventilated and well-lighted rooms. One, used as a lecture room, is furnished with cases for apparatus, chemicals and specimens. The mineral cabinet contains a large number of mineral specimens and a fair geological collection. The adjoining room is used for work in blow-piping, determinative mineralogy and wet assaying. The department is well equipped for this work. The desks are supplied with gas and water.

The laboratory will be furnished as speedily as possible with apparatus for gas analysis, and for special work pertaining to Industrial Chemistry.

DEPARTMENT OF ANALYTICAL CHEMISTRY.

Professor Davidson.

In this department there are three classes :

Qualitative Analysis.—This class is divided into two sections. Section A meets three times a week throughout the session. Section B meets five times a week for the first term. On each of these days three hours are spent in the Laboratory in studying the flame reactions, the use of the blow-pipe, and the methods of testing for the most important and more common chemical substances. The remainder of the course is devoted to a series of analyses of minerals, ores, waters, guano, and testing for poisons. There are also lectures and recitations weekly through a part of the session.

Text-book.—Fresenius' Qualitative Analysis.

Quantitative Analysis.—This class is also divided into two sections. Section A meets three times a week throughout the session. Section B meets five times a week for the first term. On each of these days three hours are spent in the Laboratory. After acquaintance is gained with the general methods of Quantitative Analysis the student devotes the remainder of his time to some line of work specially adapted to his particular course of study.

Text-books.—Bolton's Quantitative Analysis; Classen's Quantitative Analysis; Church's Laboratory Guide; Agricultural Chemical Analysis, by Frankland; Fresenius' Quantitative Analysis.

Volumetric and Organic Analysis.—This class meets five times a week for the first term. Three hours are devoted each day to work in volumetric analysis and organic analysis.

Text-book.—Volumetric Analysis, by Sutton. *Book of Reference.*—Allen's Commercial Organic Analysis.

The Laboratory will be open every day, except Saturday, until 5 P. M., and on Saturday until noon, for students who wish to devote special attention to chemistry.

The Laboratories are large, well-ventilated and well-lighted rooms, with desks, apparatus, reagents, etc., for a number of students. The balance-room contains five fine balances suitable for all kinds of work.

DEPARTMENT OF AGRICULTURE.

Professor Nourse.

In this department there are eight classes :

First Agriculture.—*General farm management, including culture and care of farm crops, agricultural implements, fences, buildings, etc.* Under these headings are studied the individual peculiarities of each kind of farm plant; the most approved methods of cultivating and preserving the same; also, in a general way, the influence of such crops in the farm economy.

The implements are taken up in their turn, and, as far as possible, classified according to the work expected of them. The aim is to place before the students plans of farm buildings of most approved patterns, and to modify the same to the special kinds of farming. To sum up briefly, the year's work is of a practical nature; to illustrate the management of the farm with its many details; the proper proportions of grass, tillage and pasture lands; the fences, implements and buildings needed, with necessary modifications, according to locality, etc.

(Class meets twice a week during second term.)

Second Agriculture.—*Drainage, Irrigation and Dairying.*—These subjects are taught entirely by lectures. A few of the main points covered are: Drainage—kinds and situation of soils needing drainage; articles that may be used in the construction of drains, as planks, stone, tile, etc.; depth of drains and distance apart; methods of excavation, of laying tile, covering joints, finding grade of bottom of ditch, making silt basins, protecting outlets, mapping for future reference, etc. Irrigation—influence on crops of a controlled supply of water; methods of conducting water, and sources of supply. Dairying—with composition and peculiar properties of, how influenced by food, climate, exposure to air, by foul odor, etc. Cream—composition of, and treatment for churning. Butter—color, texture and character of good article; methods of coloring, working, packing and marketing. In fact, the process is followed from the growing of crops

until same are converted into the marketable products. Discussion is also made of the merits of the co-operative system, the various methods adopted, and the different equipments in the way of separators, extractors and creameries.

(Class meets twice a week during first term.)

Third Agriculture.—*Stock-breeding.*—A few lectures are devoted to the history of the domestic animals, the influences, such as food, habit and climate that have operated to produce the characteristic of each breed or kind and their adaptabilities. The principles of stock-breeding are next taken up, and using Miles' Stock-Breeding as a text-book, its several subdivisions are discussed in the following order: Breeding as an art; heredity of normal and acquired characters and of diseased atavism; law of correlation, variation, fecundity; in and in and cross-breeding breeding; relative influence of parents; influence of previous impregnation; intra-uterine influences; sex; pedigree; form of animals as index of qualities; selection.

(Class meets three times a week during second term.)

Fourth Agriculture.—*Soils; Stable and Artificial Manures; Rotation of Crops, and History of Agriculture.*—The lectures are intended to run parallel with the work in the department of Agricultural Chemistry. The discussion is, therefore, confined to the physical and mechanical properties of soils and manures; the action of soluble plant-food in the soil, under various conditions; soil classification; sources of deterioration and improvement, and the influence of crop rotation in all of its bearings.

(Class meets twice a week during second term.)

First and Second Field Work.—These classes are required to spend six hours (two afternoons of three hours each) each week throughout the session in farm and laboratory work. This feature is made *educational*, and is intended to illustrate the morning lectures. Each student follows the general farm work in detail, but more particular stress is placed upon such operations as may not be easily learned on an ordinary farm.

Third Field Work.—Two afternoons (of three hours each) each week throughout the session are devoted to illustrated lectures on dairying, stock-breeding, etc.

Fourth Field Work.—This class keeps in touch with the experiment work of the department, viz.: Stock-feeding, dairying, experiments with fertilizers, with corn, wheat, tobacco and the ordinary farm crops. It also aids in performance of same when practicable.

(Class meets two periods of three hours each [in afternoon] a week throughout session.)

Books of Reference.—Beal's Grasses of North America, Flint's Grasses and Forage Plants, Tanner's Elementary Lessons in Agricultural Science, Allen's American Farm Book, Flint's American Farmer, Willard's Practical Butter Book, Willard's Practical Dairy Husbandry, Allen's American Cattle, French's Farm Drainage, Waring's Drainage for Profit, Miles' Stock-Breeding, Miles' Silos, Ensilage and Silage, Armsby's Manual of Cattle Feeding, Darwin's Origin of Species, Darwin's Animals and Plants under Domestication, Darwin's Moulds and Earth Worms, Storer's Agriculture, Johnson's How Crops Grow, Johnson's How Crops Feed, Master's Plant Life on the Farm, Warington's Chemistry of the Farm, Harris' Talks on Manures, Lloyd's Science of Agriculture, Grove's Correlation and Conservation of Forces.

In the two years' course of Practical Agriculture the same subjects are taught as in the regular course, but additional instruction is given in special lines, such as dairying, stock-breeding, etc. Such farm work is also included as is considered necessary to train good, practical farm managers.

Farm.—The farm consists of 338 acres of fine, slightly rolling land, nearly all of which is under cultivation or used as pasture. A small portion through which runs a creek needs under-draining, and this serves for the present to illustrate the morning lectures upon this subject. The farm herd is made up of three breeds, viz.: Shorthorns, Holsteins and Jerseys. These, with the optical lantern and fine collection of slides on hand, offer abundant facilities for illustrating the lecture courses. Barns for dairy animals, horses and young stock, with silo, granaries and out-houses, comprise the farm buildings. These are equipped with hay carriers, engine, feed cutter and grist mill, wagon and plat-

form scales, together with hay-ricker, mowers, tedder and the many implements usual to a farm. The entire farm is considered a laboratory in its fullest sense, to broaden and develop in the student a desire to investigate the mysteries of nature.

DEPARTMENT OF HORTICULTURE, ENTOMOLOGY AND MYCOLOGY.

Professor Alwood.

I. Horticulture.—In this branch there are four classes:

GENERAL HORTICULTURE.—Discussion of Horticulture as an art, with elucidation and application of the scientific data upon which its successful practice is based. Olericulture—Special lectures upon the growth and culture of vegetables.

Works of Reference.—Origin of Cultivated Plants, by Alphonse DeCandolle; The Vegetable Garden, by Vilmorin and Andrieux; Dictionary of Gardening, and Horticultural Literature.

(Class meets twice a week during first term.)

POMOLOGY.—Consideration of the growth and culture of the larger fruits; viticulture; small fruits, etc.

Instruction by lectures with laboratory work.

Works of Reference.—Downing's Fruits and Fruit Trees of America; Thomas' American Fruit Culturist; Barry's Fruit Garden.

(Class meets three times a week during second term.)

LABORATORY HORTICULTURE.—Culture of plants under glass; studies in germination, propagation, etc.; artificial pollination; green-house heating, lighting, etc.

Works of Reference.—Experiment Station Publications.

(Class meets three periods of three hours each a week during second term.)

LANDSCAPE GARDENING.—Lectures and practical work on the College campus.

Works of Reference.—Downing's Landscape Gardening; Scott's Suburban Grounds; The Trees of N. E. America, by Newhall.

(Class meets one hour a week during first term.)

II. **Entomology.**—In this branch there is but one class :

ENTOMOLOGY.—A systematic study of the class *Insecta* combined with laboratory work on the anatomy of the several orders of insects, and special studies in the life histories of injurious species ; preparation and application of remedies ; discussion and work illustrative of the theories of protective and remedial treatment of plants.

Students are required to collect and mount fifty species of insects.

Works of Reference.—Packard's Guide to Study of Insects ; *Insecta*, by Hyatt and Arms ; Comstock's Introduction to the Study of Entomology ; U. S. Government and Experiment Station Publications.

(Class meets twice a week during first term.)

III. **Mycology.**—In this branch there are two classes :

MYCOLOGY.—Systematic study of the Fungi. Lectures with laboratory work.

(Class meets twice a week during first term.)

LABORATORY MYCOLOGY.—Study of the Fungi as pathogenic organisms causing diseases of cultivated plants. Cultures on media ; infections on living plants ; theories of preventive and remedial treatment, with work in preparing and applying the various preparations used to protect plants from fungous diseases.

The student is required to collect and mount 25 species of fungi and prepare a thesis dealing with one or more diseases of cultivated plants.

(Class meets two periods of three hours each a week during second term.)

Works of Reference for both Classes.—Comparative Morphology and Biology of the Fungi, etc., by DeBary ; Cryptogamic Botany, by Bennett and Murray ; Saccardo's *Sylloge Fungorum* ; Plowright's Monograph of *Uredineæ* and *Ustilagineæ* ; Burrill's Monograph of the *Uredineæ* and *Erysipheæ* ; U. S. Government and Experiment Station Publications.

NOTE.—In addition to the foregoing courses the Department has facilities for giving advanced courses in Pomology, Viticulture, Vegetable Pathology, Economic Entomology, and Apiculture.

Laboratories, Grounds and Equipment.—The rooms occupied by this department include an office and library, a laboratory and

lecture-room, a special laboratory and photographic-room, and a store-room. The laboratory is supplied with microscopes and modern appliances for work in the courses of instruction offered. The department has a general collection of several thousand species of insects, representing all the orders, and considerable material representing the immature or adolescent stages of insect life. It has also a collection of specimens of diseased plants, embracing about one thousand species of parasitic fungi.

In the line of horticultural work the department is in possession of about thirty-five acres of the College farm, which are wholly devoted to fruit and vegetable culture. The permanent plantations contain some 700 varieties of fruits ; 300 to 600 varieties of vegetables are annually grown. There is also a well-built green-house of modern construction, which furnishes opportunity for work in forcing and propagating under glass. A nursery of fruit and ornamental plants has been recently established, where practical work relating to Pomology and Landscape Gardening will be illustrated.

DEPARTMENT OF BIOLOGY.

Professor Smyth.

In this department there are eight classes :

Physiology.—The aim is to teach physiological facts rather than anatomical details. The course embraces the general anatomy of the human body ; the musculo-nervous system, with especial regard to its physiology ; physiology of digestion, circulation, excretion, etc. Instruction is given chiefly by lectures. The department owns a series of physiological and anatomical models, charts, and a good human skeleton. There is also deposited a fine collection of histological microscopic preparations to illustrate the various tissues of the body.

Text-book.—Martin's Human Body.

(Class meets three times a week during first term.)

For students in advanced classes, wishing more extended work, the following is offered :

Advanced Physiology.—This presupposes a prior course in General Physiology. The different systems are taken up in detail, both as to Anatomy and Physiology, but more especially as to Histology. The course can be so arranged as to include practical microscopic technique, the staining, imbedding, sectioning, mounting and finishing of microscopical preparations, in addition to the study of the tissues as prepared.

Books of Reference.—Gray's Anatomy; Foster's Physiology; Prudden's Histology; Parker's Zootomy; Whitman's Microscopical Methods, etc.

Zoology.—SYSTEMATIC AND STRUCTURAL ZOOLOGY.—Classes of animals and their relationships. The object of the course is to give the student a practical knowledge of the details of structure of some typical animal or animals in each group, by means of laboratory dissections, and by comparison of the main systems of the animal under dissection with those of the animal previously dissected. In the lecture-room the facts so gained are collected, and a comprehensive view of the group to which the animal belongs is presented, with a comparison of the preceding group, and the deduction of generalized principles from this special work. The department has deposited with it a collection of alcoholic specimens for dissection, illustrating the more important forms of marine life, and also dried specimens for exhibition, covering the groups of Cœlenterates, Echinoderms, Molluscs, Arthropods, etc.; also microscopic slides exhibiting details of structure in many of the groups. There is also a collection of butterflies and moths, native and exotic, illustrating some two thousand species.

Books of Reference.—Colton's Practical Zoology; Claus and Sedgwick's Zoology; Holder's Zoology; Packard's Zoology, etc.

(Class meets twice a week during second term.)

Economic Zoology.—Study of animals, more especially birds, beneficial or injurious to man, with determination of species. A collection of bird skins and mounted birds, six hundred in number, and a collection of nests and eggs, are accessible to the stu-

dent in this course, and are used freely for purposes of comparison and determination.

(Class meets once a week during second term.)

Structural Botany.—The organs of plants and their modifications; vegetable anatomy. The course is on the basis of Dr. Gray's interpretation of the term, and is intended to prepare the student for the course in systematic work. For this reason the microscopical anatomy, the histology, of plant life is merely touched on, the class being occupied with the gross anatomy. Instruction is chiefly by lectures.

Text-book.—Bastin's College Botany.

(Class meets twice weekly during first term.)

Systematic Botany.—Classification of plants and the determination of species; the latter portion of the course being practical laboratory work upon the plants of the neighborhood. Each student is required to analyze and determine for himself the species submitted to him and to acquaint himself with the characteristics of each order investigated. Herbarium of two or three thousand species of plants is in the laboratory, to which access is granted for comparison and study. Field work will form a valuable part of this course.

Text-book.—Wood's New Class Book of Botany, and Manual.

(Class meets twice weekly during second term, spending two hours in laboratory work at each meeting.)

Vegetable Physiology.—Study of plant life; microscopic investigation of plant structure; vegetable histology. Work is almost entirely practical. The Laboratory is fitted with compound microscopes, running water for delicate water plants, apparatus for growing specimens of the Thallophyta, etc.

Books of Reference.—Gœbel's Outlines of Classification; Bower's Practical Botany; Gray's Physiological Botany; Bessey's Botany.

(Class meets three times a week during second term.)

Biology.—A discussion of the general laws of life, both vegetable and animal, and so much detail of structure and habit as will serve to illustrate fundamental principles.

Text-books.—Nicholson's Biology; Sedgwick and Wilson's Biology.

(Class meets once a week throughout session.)

In all the foregoing courses theory will be made as much as possible subservient to practical work. The collections of plants, animals, insects, etc., and the facilities for laboratory work, both gross and microscopic, enable the department to make effective the courses of instruction mapped out.

DEPARTMENT OF VETERINARY SCIENCE.

Professor Niles.

In this department there are two classes:

First Veterinary Science.—**VETERINARY ANATOMY.**—The anatomy of the horse is a subject of special study. The structural differences of the domestic animals are carefully explained and illustrated by a large number of natural and artificial specimens, consisting of skeletons, diseased and normal bones; models of various organs, among which may be mentioned the stomachs of the cow and horse, showing their entire structure and internal arrangement, and model of foot of horse, showing entire structure of the foot with its blood vessels and nerves. All the foregoing specimens and others are used in illustrating the subject taught, and are placed at the disposal of the student for reference. Dissections, also, in a room specially fitted up for the purpose, are made to illustrate the course.

Text-book.—Steel's Outlines of Equine Anatomy.

VETERINARY MEDICINE.—A few lectures on therapeutics are followed by the discussion and study of the nature, cause (including the bacteriology of contagious diseases), symptoms and treatment of the diseases common to domestic animals. The constant treatment of a large number of patients at the Veteri-

nary Infirmary gives the student an excellent opportunity for studying the action of medicines upon diseased animals, as well as for observing the progress and course of the various diseases to which domesticated animals are subject. Post-mortem examinations are made, whenever possible, in order to give the student familiarity with the pathology of the various diseases.

Book of Reference.—Law's Farmers' Veterinary Adviser.

(Class meets three times a week throughout session.)

Second Veterinary Science.—**VETERINARY SURGERY.**—Lectures on the principles and practice of veterinary surgery. These are illustrated by clinics and by operations performed during the course of practice and on dead subjects. The student is familiarized with the pathogenic bacteria met with in surgery, and also with the various instruments used in its practice. The department is well supplied with surgical knives of all kinds, dental and hoof instruments, a complete set of instruments for operations on the eye, probangs, amputating-case, combination injecting and stomach-pump, and many other instruments of the latest and most improved make.

Works of Reference.—Williams' Principles and Practice of Veterinary Surgery and Fleming's Operative Veterinary Surgery.

VETERINARY OBSTETRICS.—Lectures on fetal development; the proper procedure in parturition, including mal-presentations and the diseases incidental to parturition. The various mal-presentations met with in the lower animals are described in full and illustrated by charts and drawings, making their diagnosis easy. Practical illustrations are given when opportunity offers.

Work of Reference.—Fleming's Veterinary Obstetrics.

(Class meets twice a week throughout session.)

The department aims so to train agricultural students as to enable them properly to care for stock, and to treat the simpler forms of disease when the services of a veterinarian are not available. To this end an extensive course of instruction has been adopted, embracing the most improved methods of theoretical and practical teaching.

Laboratories and Equipment.—The department occupies three rooms, one of which is used for office and lecture-room and as a general laboratory, and one as a bacteriological laboratory, where many of the pathogenic bacteria are cultivated and their action upon the lower animals studied, thereby giving the students an opportunity to become acquainted with the different forms of disease-producing germs, as well as the methods of cultivation and examination.

A veterinary infirmary is located near the station. It contains several stalls (both box and single), operating-room, dissecting-room, drug and instrument-room, and a special compartment for experimental animals. This affords the student abundant material to familiarize himself with all of the different branches taught in this department.

Free Clinics are held, which the students are required to attend and assist in all operations and the treatment of diseased animals. Post-mortems are held in all fatal cases, by means of which the students acquire a knowledge of the pathology of diseased animal tissue. In the dissecting-room the students are made familiar with the differences and location of all of the different structures of the domestic animals.

DEPARTMENT OF MATHEMATICS AND CIVIL ENGINEERING.

Professor Christian, Assistant Professor Harman, Instructor Hurt.

I. Mathematics.—In this branch there are five classes :

FIRST MATHEMATICS (B).—Arithmetic reviewed ; Algebra completed through Quadratic Equations ; Plane Geometry and Solid Geometry, except the Sphere ; Plane Trigonometry through the Solution of Triangles.

In Geometry and Trigonometry particular attention is paid to exercising the class in original theorems and problems.

Text-books.—Venable's Arithmetic ; Wentworth's Algebra ; Wentworth's Geometry ; Schuyler's Trigonometry.

(Class meets six times a week throughout session.)

FIRST MATHEMATICS (A).—Algebra, Plane and Solid Geometry, Plane Trigonometry.

Particular attention is given to exercising the class in original theorems and problems.

Text-books.—Wentworth's Algebra ; Wentworth's Geometry ; Schuyler's Trigonometry.

(Class meets six times a week throughout session.)

SECOND MATHEMATICS (A).—Analytical Geometry (Loomis').

(Class meets three times weekly throughout session.)

SECOND MATHEMATICS (B).—Spherical Trigonometry (Schuyler's) ; Calculus (Loomis').

(Class meets twice a week throughout session.)

THIRD MATHEMATICS.—Calculus (Loomis') concluded ; Method of Least Squares (Merriman's).

(Class meets three times a week throughout session.)

The course in this branch is at once theoretical and practical. The objects sought to be attained are mental discipline and a thorough knowledge of the practical applications of Mathematics. The method of instruction is by lecture combined with the study of approved text-books.

II. Civil Engineering.—In this branch there are six classes :

SURVEYING.—Land surveying ; use of transit, level, etc.

Text-book.—Davis' Surveying.

(Class meets twice a week during second term.)

GEODESY.—Railway curves, etc.

Text-book.—Johnson's Geodesy.

(Class meets three times a week during session.)

CIVIL ENGINEERING.—Roofs, trusses, bridges ; strength of materials, etc.

Text-books.—Gillespie's Roads and Railroads ; Wheeler's Civil Engineering ; Wood's Bridges and Bridge Building.

(Class meets three times a week throughout session.)

CIVIL ENGINEERING DRAWING.—Class meets twice a week throughout session, spending three hours at each meeting in designing and drawing bridges, etc.

FIELD PRACTICE.—Surveys of land; topography, etc.; laying out curves, earthworks and masonry. Nine hours a week (three periods of three hours each per week) for two sessions are devoted to this work.

The subjects studied in this branch include Engineering, Engineering Construction, Lines of Communication, Resistance of Materials, Stability of Structures and Hydraulic Engineering. The student is drilled in the methods of measuring and estimating distances, altitudes and angles. This work is supplemented by field practice and use of instruments.

The department is supplied with magnetic compass, transit with solar attachment, level, etc.

DEPARTMENT OF MECHANICAL ENGINEERING.

Professor Fitts.

There are twelve classes in this department:

Descriptive Geometry.—Solution of problems on the point, line and plane; projection and intersection of solids; shades and shadows; isometric and scenographic projection. In addition to the lecture-room work a large number of practical problems are worked out by the class in Second Mechanical Drawing.

Text-book.—Faunce's Descriptive Geometry.

(Class meets twice a week during first term.)

Mechanics.—Study is made of the fundamental principles of dynamics and statics; the relations between force, mass and acceleration; laws of motion; resultant of two or more forces; principle of moments and the conditions of equilibrium of bodies; centre of gravity, areas and volumes, and moments of inertia; fluid pressure and centres of pressure; flow of fluids.

Text-books.—Goodeve's Mechanics; Lanza's Applied Mechanics.

(Class meets twice a week throughout session.)

Principles of Mechanism.—This subject embraces the various methods by which motion is transmitted from one piece to another, and the velocity ratios between connected points in any system. Beginning with composition and resolution of motions and velocities, the class then takes up the conversion of circular into reciprocating motion and reciprocating into circular; transmission by wrapping connectors and gearing; link work; aggregate motion and epicyclic trains; miscellaneous contrivances.

Text-book.—Goodeve's Elements of Mechanism.

(Class meets three times a week during first term.)

First Applied Mechanics.—Strength of materials and the theory of structures; determination of stresses in pieces under various loads, and proper proportioning of the parts of structures. Prominence is given to a critical examination of tests which have been made, and the inferences to be drawn therefrom.

Text-books.—Mechanics of Materials; Lanza's Applied Mechanics.

(Class meets three times a week during second term.)

Second Applied Mechanics.—The mechanics of machinery is studied under this head; also the kinematics of machines by Reuleaux's methods (though not strictly a branch of Applied Mechanics).

Text-book.—Kennedy's Mechanics of Machinery.

(Class meets three times a week during first term.)

Machine Design.—In this class the student brings together the scientific principles already acquired, and applies them in designing machines to perform given functions and in proportioning their parts to resist deformation. He is also given opportunity to become familiar with successful existing designs.

Text-book.—Unwin's Machine Design.

(Class meets three times a week during second term.)

Thermodynamics.—Under this head are included steam and other heat engines, air compressors and refrigerating apparatus. Study is first made of the laws of thermodynamics and the theo-

retically perfect heat engine ; the steam-engine is treated both as an apparatus for the conversion of heat into work and as a machine, and a thorough investigation made of the various types of simple and multiple expansion engines ; construction of steam boilers with reference to economical combustion of fuel, proper circulation and safety, and chimney draft ; pumping-engines ; gas, oil and hot-air engines, refrigerating apparatus. Engine and boiler trials are conducted by this class, determining evaporative efficiency of boiler and dryness of steam, indicated and break-horse power of engine, and efficiency of engine by feed-water test.

Text-books.—Holmes' Steam Engine ; Peabody's Thermodynamics ; Unwin's Machine Design, Part II. ; Thurston's Engine and Boiler Trials.

(Class meets three times a week throughout session.)

Astronomy.—A general course in Astronomy.

Text-book.—Young's General Astronomy.

(Class meets twice a week throughout session.)

Mechanical Drawing.—Each class meets twice a week throughout the session, the periods being three hours each.

FIRST.—Use of instruments, lettering, easy, working drawings, and conventional signs, tracing and printing.

SECOND.—Descriptive geometry problems ; shading with pen and brush ; isometric and perspective drawing.

THIRD.—Studies in screw threads, gearing, couplings and other connections ; working drawings made from sketches of machines in the shop.

FOURTH.—Machine design, estimates and specifications. Before graduating each student makes a complete design of a machine, for which the requisite data are given.

Equipment.—The mechanical engineering department is equipped with steam-engine indicators, dynamometers, calorimeters, water meters, apparatus for testing steam-gauges, models and sectional parts of gauges, valves, engine and boiler fittings, pumps in section, with various articles used by engineers, as dif-

ferent kinds of belting, pipe-covering, packing, etc. The shop equipment is made use of whenever necessary. Numerous drawings, photographs, plates, catalogues and hand-books of manufacturers serve to illustrate and make the student familiar with the best modern engineering practice.

The draughting-room is large and well-lighted, and is equipped with drawing-boards and T-squares of the best make ; substantial and convenient trestles ; instruments for general use, such as beam compasses, irregular curves, etc. ; blue print frame and bath tray ; water supply for washing purposes.

This department has been the recipient of donations from a number of manufacturers and others, of which a list is given on pages 70-72.

DEPARTMENT OF PHYSICS AND ELECTRICAL ENGINEERING.

Professor Anderson.

I. Physics.—In this branch there are two classes :

PHYSICS.—Fundamental conceptions, force and mass ; elementary mechanics, including the principle of conservation of energy ; gravitation ; molecular mechanics ; mechanics of fluids ; heat ; magnetism and electricity ; sound ; light.

The course is intended to present the fundamental principles of physics, and wherever practicable, to establish them experimentally before the class ; also, without entering into a detailed description of commercial methods and machines, to illustrate the practical applications of these principles. Special attention is paid to the exact measurement of the quantities studied, and problems bearing upon the points discussed are given for solution. An illustration of each physical law is sought in some familiar phenomenon. Students are encouraged to perform simple experiments for themselves. It is attempted to show that the science of physics treats not only of unfamiliar things, but also explains ordinary natural occurrences.

Instruction is given by lectures, experimentally illustrated, text-book, notes, solution of problems, written discussions of the experiments performed before the class, and recitations.

Text-book.—Gage's Physics.

(Class meets three times a week throughout session.)

LABORATORY PHYSICS.—Measurement of length, mass and time; experiments in the mechanics of solids and fluids; acoustics; heat; optics; electricity and magnetism.

This course follows and supplements the preceding one, the aim being to give the student a clearer insight into the general subject. It consists for the most part of quantitative measurements. Special attention is given to subjects having a distinctively practical value. The experiments are accompanied by instruction in methods, and the student is taught to draw correct conclusions from his observations.

Text-Book.—Practical Physics, by Glazebrook and Shaw. *Works of Reference.*—Kohlrausch's Introduction to Physical Measurements, Pickering's Elements of Physical Manipulations.

(Class meets three times a week throughout session, spending three hours at each meeting in the Laboratory.)

II. **Electrical Engineering.**—In this branch there are four classes:

The general aim of the several courses offered in this branch is to give a good knowledge of the theory and applications of electricity and magnetism, and to train the student in the measurement of electrical and magnetic quantities, and also in the construction and management of apparatus for their generation, transmission, storage and utilization. The consideration of the latter topics in a strictly professional and commercial way is reserved for the graduate courses. As electrical laws are more clearly apprehended when illustrated by experiment, in all the courses, several hours are spent weekly in the laboratory.

FIRST ELECTRICITY.—The course is arranged to give the student an exact working knowledge of electric currents; difference of potentials; resistance; electro-motive force, quantity, capacity

and power; also of the instruments used in the measurement of the same; in other words, a knowledge of electrical testing in all its forms. Careful attention is given to the construction, action, care and value of different forms of primary and secondary batteries and condensers. Instruction is given by lectures, text-book, recitation, solution of problems and laboratory practice.

Text-book.—Practical Electricity, by Professor Ayton.

(Class meets twice a week during second term.)

SECOND ELECTRICITY.—Fundamental principles of magnetism, electro-magnetism and current induction and their applications in commercial apparatus; construction, action and care of electric bell, telegraph, telephone, dynamo, electric motor, transformer, etc. Different kinds of electro-magnetic apparatus are constructed in our shops, and the student takes part in their manufacture, adjustment, starting and testing. Methods of instruction same as in preceding course.

(Class meets twice a week throughout session.)

THIRD ELECTRICITY.—Mathematical discussion of the topics covered in the two preceding courses. Comprehensive view taken of whole subject. Methods of instruction same as in preceding courses, except parallel reading required in addition.

Text-book.—Mathematical Theory of Electricity and Magnetism, by Clerk Maxwell.

(Class meets three times a week throughout session.)

LABORATORY ELECTRICITY.—Use of instruments of precision; scientific determinations; experiments bearing upon obscure points.

(Class meets three periods a week of three hours each throughout session.)

Equipment.—This department occupies two rooms. The large lecture-room is well lighted and ventilated and supplied with steam, gas and electricity. Abundant provision is made for experiments on light. It is furnished with excellent seats, lecture table, cases, etc. The laboratory is similar in size

to the lecture-room. Continual additions of apparatus, manufactured for the most part in our own shops, are being made to the equipment. Connection with the electric light dynamo furnishes to both rooms any current from $\frac{1}{100}$ of an ampere to 200 amperes.

DEPARTMENT OF SHOP-WORK.

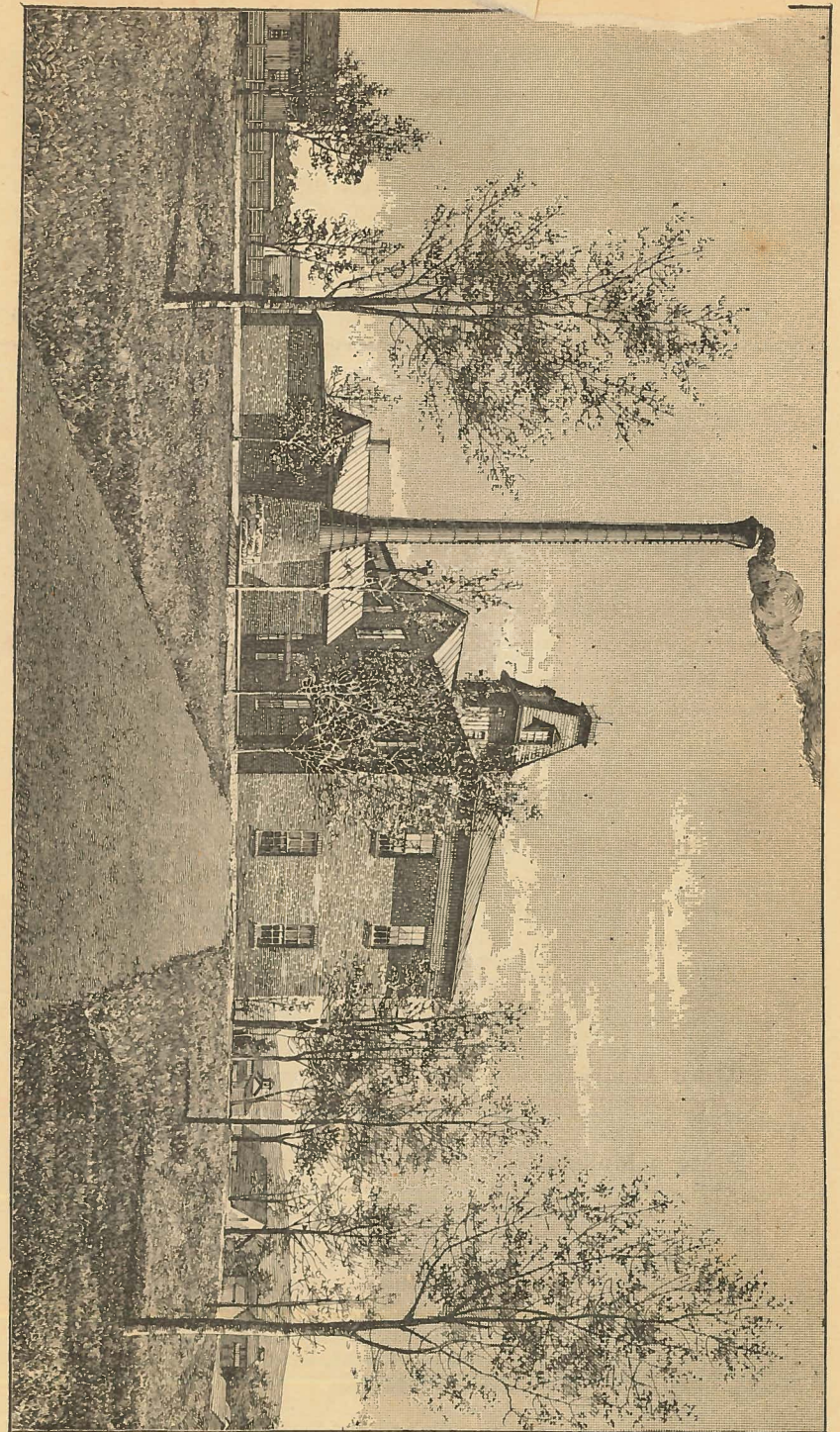
Director Anderson. Instructors Cunningham and Bray.

In this department there are six classes :

Of the courses of instruction offered in this department some aim to impart to students offering for the several engineering degrees a clear understanding of the principles and methods of the most important branches of mechanical industry; and others to give students completing the course of Practical Mechanics the mastery of some trade. In each course the theory and construction of the tools used, properties of the materials handled, and the principles underlying the subjects discussed are first taken up and next the application of these principles to the construction and use of the tools and machines required in more difficult operations. The subjects are treated in a purely descriptive way, as questions relating to Mathematical Mechanics and the theory of construction are assigned to another department of instruction.

The method of instruction combines lectures and practical work. Before any operation is begun it is fully discussed from every standpoint, and the lectures and recitations are made to illustrate the principles advanced and the methods employed. The hours given to lectures are to those given to practice in the proportion of one to five. Wherever practicable, articles of use are assigned as exercise, and the importance of accuracy and attention to detail is stressed. The methods adopted approximate those of a first-class manufacturing establishment as closely as possible.

Wood-Work.—Ten weeks are given to elementary bench work, in which the construction and use of ordinary bench tools, the properties of woods and the principles of joinery are treated



MECHANICAL BUILDING.

and illustrated by a carefully graded series of exercises; ten weeks are devoted to wood-turning, in which the construction and use of the lathe and lathe tools are treated, and a course of illustrative exercises given; the remainder of the session is given to general construction and instruction in the use and construction of the machine tools in the shop. The engineering students take as their construction work pattern-making; the other students take carpentry or cabinet-making.

(Class works nine hours a week throughout session.)

First Machine Work.—Fifteen weeks assigned to study of ordinary bench tools and practical instruction in their use, including laying out work, chipping, filing, scraping, polishing, tapping, cutting threads, calipering, accurate measuring, etc. Fifteen weeks assigned to study of engine lathe and lathe tools, their work and uses. The exercises are made to illustrate the different kinds of work. The remainder of the session is devoted to simple instruction in iron and the study of its properties.

Book of Reference.—Rose's Modern Machine Shop Practice.

(Class works nine hours a week throughout session.)

Second Machine Work.—Study of planer, shaper, and milling machine, and exercises in their use for half term. Construction in brass and other alloys, and study of their properties remaining half term.

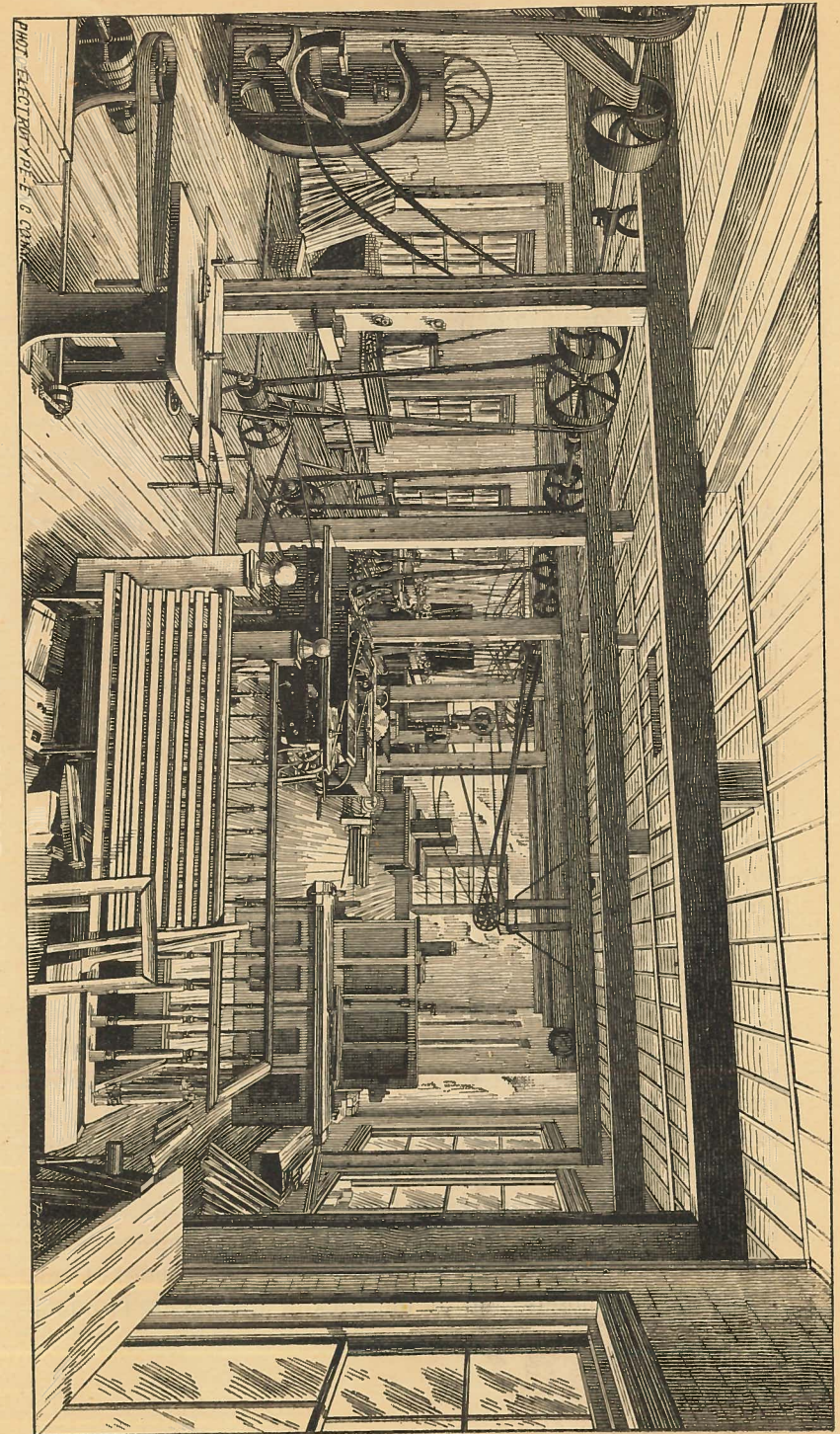
Book of Reference.—Rose's Modern Machine Shop Practice.

(Class works nine hours a week during second term.)

Third Machine Work.—Construction of engines, pumps, etc. (Class works nine hours a week throughout session.)

Pattern-Making.—Offered to students in second year of course of Practical Mechanics; thirty hours a week of shop work, with special instruction in the methods of pattern-making.

Machinists' Work.—Offered alternately with pattern-making, to students in second year of course of Practical Mechanics;



WOOD-WORKING SHOP.

PHOT. ELECTROTYPE BY C. C. COVINGTON

thirty hours a week of shop work, with special instruction in different branches of machine work.

Text-book.—Rose's Modern Machine Shop Practice.

The students in wood work will, during the present session, make new seats for the lecture rooms, new tables for the mess, and many other articles for the better equipment of the College, and the students in the machine shop, special tools for the shops, a small steam engine, a duplex steam pump and apparatus for the Department of Physics, etc.

Equipment.—The shops occupy a two-story brick building, with boiler and coal-house detached. The main building is 40 by 110 feet. The machine shop, the supply room and the engine room are on the first floor; the wood-working room is on the second floor, and the store rooms for lumber in the attic. The wash room is between the two floors. Power is furnished by a fifty-horse power Buckeye engine, which also drives the electric light dynamo. This is connected to the main head shaft by a friction clutch, so that the shafting of the shops can be started or stopped at pleasure without interfering with the engine. The shafting of each room is also connected with its head shaft by a clutch. Steam is generated by a battery of two sixty-power horizontal return tubular boilers, fitted with all modern appliances. One supplies sufficient steam for our needs and the other is kept in reserve. The shops throughout are heated by exhaust steam from the engine and lighted by incandescent electric lights.

The Wood-working room is 40x110 feet, and contains eighteen work-benches (described below); twelve 12"x5' turning lathes (described below); one large turning lathe, one combination rip and cut-off circular-saw, one large circular-saw, one hand-saw, one scroll-saw, one mortising and boring machine, a reversible shaper, one double-headed universal wood-worker, one 24" surface planer with tonguing and grooving attachment, one Daniel's planer, one steam glue-heater and one steaming-box. The work-benches are 8x2½ feet, strongly and neatly built of oak. Below are two closets, and at the back of the top are two tool-

cases, each case containing the following tools: One rip-saw, one panel-saw, one tennon-saw, one joint-plane, one jack-plane, one smoothing-plane, one block-plane, one claw-hammer, one mallet, one set of chisels, one set of gouges, one screw-driver, one scriber, one framing-square, one try-square, one bevel-square, one marking and mortise-gauge, one pair of compasses, one bit-brace, one set bits, one brad-awl, one oil-stone, one oil-can, one rule and one dust-brush. Each bench is fitted with a Massey's vise; one bench accommodates two students working on alternate days, each student having exclusive use of one set of tools and one closet. The turning lathes are equipped similarly to the benches, each lathe having two sets of tools. Each set is arranged on a system of boards, and kept when not in use in cases under the lathe; when used these boards are placed on the rear end of the lathe, where the tools can be easily reached by the student at work. A set of lathe tools includes three turning gouges, three turning chisels, one parting tool, one pair of calipers, one pair of dividers, one hammer, one oil-stone, one slip-stone, one oil-can, and one dust-brush. As with the benches, each lathe accommodates two students on alternate days, each student having a set of tools and a case to himself. Sixteen feet is cut off at one end of this room; a part of this space is used as the instructor's office. Among other things kept in this office is a complete set of tools not in such frequent demand as to necessitate their being included in the regular sets. The remaining part of the space is made dust proof, and used as a finishing-room.

The Machine Shop occupies a space 80x40 feet, and contains eleven work-benches (described below), one 14"x6' Flather engine lathe with taper attachment, two 14"x6' Flather engine lathes, three 17"x5' Muller engine lathes, one 16"x8' Reed engine lathe, one 10"x5' Reed engine lathe, one 12"x4' Diamond hand lathe, one 10" speed lathe, one 15" Walcott shaper, one 10"x10"x22" Hendy planer, one 24"x24"x5' Gray planer, one No. 15 Brainard universal milling machine, one 18" Reed drill press, one emery grinding machine, one grinding stone, one pipe vise and bench with tools for working pipe up to 3". In the instructor's office are kept for general use in the shop complete sets up

to one inch of twist drills and taps and dies, up to two inches of reamers and mandrils; an assortment of files of various sizes and shapes, of calipers, scales, squares, hammers, chisels, and many other tools. The work-benches are on the same plan as those of the wood-room. They are eight feet long and two and a half feet wide, and have a four and a half inch swivel jaw machinists' vise on each end; in the centre of rear edge are four cases of tools (two for each vise) and below are four closets. Each tool-case contains the following: One ball-pin hammer, two cold chisels, two cape chisels, one prick punch, six assorted files, one scraper, one 4" scale, one 3" machinists' square, one centre gauge, one scriber, one pair of 6" outside calipers, one pair of 5" inside calipers, one pair 3" outside spring calipers, one pair 5" spring-dividers, one 10" monkey-wrench, one screw-driver, one set of eight lathe cutting tools, one oil-stone, one oil-can, one file card, one pair of copper jaws for vise, and one dust-brush. Each bench will accommodate four students (two on alternate days), each student having a set of tools and a closet to himself. Each machine has a box under it, in which its attachments are kept, and a stool near it for the reception of tools when in use.

The Supply-Room is 14x22 feet, and is fitted up with shelves, racks, cases, etc., for the storage of supplies. A dry-kiln for drying lumber is situated over the boiler-room and heated by steam.

A forge-room and foundry are now in process of construction, and will be in operation by the beginning of the next session.

DEPARTMENT OF ENGLISH, HISTORY AND POLITICAL ECONOMY.

Professor Sheib.

In this department there are eight classes:

First English.—Only a small fraction of the time given to the work in this class is devoted to the theoretical study of English Grammar. Written exercises in some form are required daily. These exercises consist of dictations, reproductions, carefully pre-

pared compositions, and occasional original papers, for which no directions are supplied in the class-room. All papers must be written in ink. Clear thoughts and simple and correct expression are sought. All work is carefully corrected, returned and reviewed. All expression is traced to the idea which preceded it, and all connections are measured by the logical relation between the ideas. The rules of Grammar and the principles of Rhetoric are deduced from the written work of the students. Special attention is also given to proper articulation and the rational use of the organs of speech. Selections are read and mutual and self-criticisms are encouraged.

Text-books.—Dalglesch's Analysis and Bain's Logical Grammar.

(Class meets five times a week throughout session.)

Second English.—In this class the historical study of the English language is taken up. Attention is given to grammatical forms and constructions. The logical connections are contrasted with the idiomatic peculiarities of the language. The principles of Rhetoric are developed in connection with the written exercises. Rhetoric receives special attention during the second term. Select works from English literature are considered. In all of the written work, which constitutes an important part of the course, clearness of ideas and ease of expression are made the standards of criticism. Essays or selections from the poets are read in class each week. Essays are required on subjects which have been previously discussed in class, alternating with original papers. Outlines and summaries are prepared, and the students are exercised in taking notes during lectures.

Text-books.—Morris' Outlines of Historical English Grammar; Bain's Logical Grammar; Hill's Rhetoric; Hale's Longer English Poems.

(Class meets three times a week throughout session.)

Physiography.—The work of this class is intended to serve, in part at least, as an introduction to the study of other sciences, more especially as a preparation for the study of Geology, Botany and Zoology and somewhat more remotely to the study of Anthropology, Psychology and Political Economy. It reviews, there-

fore, the history of the formation of the earth's crust—the effects of fire and of water, the upheavals and the formation of continents. It is a special study of the fixed forms of the earth's surface; the geographical position and extension of continents. But whether tracing the formations historically, or presenting a descriptive account of its surface as it presents itself to us at present, the earth is regarded as a "cosmos," a living organism in which all parts are related, and in which every change extends to all parts. It is further studied as a part of the solar system, also as the seat of vegetable and animal life, and as the abode of man, upon whose development, physically, mentally and morally, elevation, latitude, fertility of soil and temporary isolation exercise an influence of the most persistent nature. Instruction by lectures, recitations and essays.

Text-book.—Geikie's Physical Geography. *Reference.*—Ritters' Geographical Studies.

(Class meets twice a week during the second term.)

History.—During the present year, the class studied the history of England, as the country more intimately related to the United States than all others. A proper appreciation of American institutions is not possible without a knowledge of English history. Bearing this in mind, it follows naturally that the work of the class should be directed to the elements which give to English society its peculiar form, the growth of its institutions, the gradual restriction of the power of its monarchs, its representative form of government and the struggles which lead to political and religious independence. The appearance of the country at different periods, the customs, dress, public and private life of the people, the literature, the institutions of learning, architecture and commerce are regarded as more important than the mere records of succession and the success of arms. Instruction by lectures and recitations.

Text-book.—Montgomery's More Important Facts in English History. *For Reference.*—Green's History of the English People.

(Class meets twice a week during first term.)

Constitutional History.—The development of society and of the political body is traced historically, mainly with a view to impress upon the mind the conditions under which the existence of the State is made possible. In a course of lectures the ancient State as it existed in Greece and Rome, the feudal system and the English borough are described. The English constitutions receive special attention because of their influence upon the American form of government. The New England and the Virginia colonial governments are contrasted, and the relations of the older colonies to western territory are carefully noted. The evolution of State and National constitutions is traced. The Federal constitution is reviewed and criticised. The powers of the different departments of government and the duties of the officers of the respective branches are discussed. The constitution of the State of Virginia is specially considered, and the more important laws respecting county and town government, the rights and duties of citizens, the legislation regulating the transfer of property, the enforcement of order, the rate and collection of taxes, the suppression of crime and the responsibility of obligations are made the subjects of particular inquiry. Instruction is by lectures, discussions and recitations. Essays are required.

Text-book.—Fiske's Civil Government. *For Reference.*—Woodrow Wilson's The State; Code of Virginia.

(Class meets three times a week during first term.)

Political Economy.—The economic systems of the past are briefly reviewed, and their defects and failures are traced to the erroneous ideas upon which they were erected. The division of labor which accompanies the development of a complicated society leads historically and logically to the consideration of the philosophy of wealth. The influence which economic opinions exercise upon politics, legislation and the intercourse between nations, makes it all important that the principles of economy should be studied in accordance with methods as scientific as those which prevail in the laboratory and the dissecting-room. The necessity of deciding by the ballot economic questions involving the prosperity or the ruin of the nation, make it all important

that clear ideas should prevail respecting the relations between Production, Exchange, Distribution and Consumption. It is to the careful examination of the questions pertaining to labor, capital, money, rents and wages that the attention of the class is directed. Instruction is by lectures, recitations, discussions and essays.

Text-book.—Walker's Political Economy (Briefer Course). *For Reference.* Walker's Fuller Course; Gide's Political Economy and Mills' Political Economy.

(Class meets three times a week during first term.)

Psychology.—Proceeding from the observation of the simplest mental phenomena, the study of the organs of sense and the proper appreciation of the quality, intensity and distribution of sensation, it traces the gradual development of the higher types of psychical life. Avoiding the confusing and disputed metaphysical formulas in which the ordinary text-books abound, the historical and experimental methods are used for illustrating the laws of association and reproduction. The conditions under which thought is developed, intensified, modified and obscured are considered, and the effects of these changes on the formation of habits, the cultivation of the will, and the perfection of taste and the feelings are specially studied, because of their bearing upon the development of character and the growth of principles of morality. The instruction in this class is by lectures. Subjects may be presented for discussion. Essays are required during the session.

For Reference.—Preyor's The Senses and the Will; Lidner's Psychology; Bernstein's The Senses of Man; James' Briefer Psychology; Hoeffding's Outlines.

(Class meets three times a week during second term.)

Ethics.—The course in philosophical ethics proceeds from the discussion of æsthetic judgments to the consideration of the differences of the relative and the absolute values in morals. The universality and the absolute value of ethical verdicts is contrasted with the judgments which are peculiar to the departments

of speculative thought. The possible forms of ethical judgments are presented and the imperative nature of moral obligations which grow out of these judgments is demonstrated. The fundamental ideas of perfection, benevolence, justice, equity and moral freedom, as the embodiment of all that is commonly comprehended under the name of virtue and duty, are made the principal subjects of study in this class. The application of these principles to society, necessarily directs the attention to man's moral obligations as a member of society and his duties as a citizen. For the practical application of ethical principles, the psychological studies of the previous year are supposed to have made the necessary preparation. Instruction is by lectures, discussions and essays.

(Class meets three times a week during second term.)

DEPARTMENT OF MODERN LANGUAGES.

Professor Campbell.

There are six classes in this department:

First German (A).—Special attention is paid to pronunciation; daily drill being given in the vowel and consonantal sounds, both simple and compound, until the class masters them.

In grammar the class will be occupied mainly in work with the forms, article, noun, adjective, pronoun, verbs, strong, weak and mixed, with such principles of syntax as can be brought out in a course of one year, and in noting the resemblances and differences in word forms between German and English dictation. The work in composition consists of written exercises handed in to the Professor and corrected by him, and also in rendering English into German at sight. Especial stress will be laid upon this work.

The translation will consist of selections from the Reader and an easy play. A full course of notes on the selections to be translated will be given the class by the Professor from the mimeograph. The aim of these notes is to broaden the student's vocabulary,

and in them will be noticed idiomatic expressions, peculiarities of construction, peculiarities in the meanings of words and the influence of the prefixes and suffixes on original verb forms, etc.

It is believed that a proper use of these notes will be a great aid to the student in enabling him to acquire quickly and readily a reliable vocabulary.

Text-books.—Joynes-Meissner German Grammar (last edition); Joynes' German Reader; Schiller's *Der Neffe Als Onkel*.

(Class meets three times a week throughout session.)

First German (B).—The work in this class is only a broadening and extension of that in First German A.

More and fuller work in word forms, in syntactical construction, in composition and translation is both given and required. Dictation.

Text-books.—Same as in First German A, and in addition Schiller's *Jungfrau Von Orleans* and Toy's *Freytag's Die Journalisten*.

(Class meets twice a week throughout session.)

Second German.—Work in grammar, composition and word forms continued—application of Grimm's Law; preparation and submission for criticism of at least two original theses written in German; larger and more varied translation. The work of grammar and reader is largely supplemented by lectures and notes by the Professor.

Text-book.—Same grammar with Whitney's German Grammar (revised). *For Reference.*—Selections from Schiller, Lessing and Freytag, and Goethe's *Faust*, first part.

(Class meets three times a week throughout session.)

First French.—The work of this class corresponds in great measure with that of First German A. Daily drill in pronunciation, work in grammar, in forms, and as much as can be done in syntax. Lectures by the Professor supplement the work in grammar. Constant drill is given in rendering English into French, both at sight and by written compositions. Translation con-

sists in selections from the reader and the best authors. Dictation.

Text-books.—Whitney's Brief French Grammar; Böcher-Otto's or Whitney's French Reader; *Trois Coutes Choisis* par Daudet; *Jeanne d' Arc* par Lamartine. Materials for French composition par Grandguet. Part III. based on *La Siège de Berlin*.

(Class meets three times a week throughout session.)

Second French (A).—The work in grammar will be exclusively in syntax and will be taught largely by lecture. The work in composition is continued—that is, rendering English into French, both by written compositions and at sight. Translation from classic authors. Dictation. At least one original essay in French will be required in second term.

Text-books.—Böcher-Otto's French Grammar; *Sept Grands Auteurs au XIX^e Siècle* (Fortier), Racine's *Athalie*, Corneille's *Le Cid*, Hugo's *Hernani*, or substitutes therefor.

Second French (B).—The work is the same as in Second French A, but enlarged in translation, in composition, in sight rendering, and, in addition, a course of lectures by the Professor on the French language and literature from Corneille to Hugo is delivered in the second term. Dictation. At least three original essays in French are required during the session, to be submitted for criticism and comment.

Text books.—Same as in Second French A, and in addition Pylodet's *La Littérature Française Classique*, and selections from Sands, Molière and others.

(Class meets twice a week throughout session.)

In this course no attempt is made to teach students to speak French or German. It is the aim to give an accurate knowledge of pronunciation, and as far as possible of grammar; also ability to read with some degree of facility the best authors. The Professor is enabled by means of the mimeograph to give full and copious notes on all texts.

NOTE.—Graduate courses will be arranged upon application; also courses in the Latin language and literature.

DEPARTMENT OF BOOK-KEEPING AND PHONO-
GRAPHY.*Instructor Hurt.*

In this department there are two classes :

Book-keeping.—Elementary principles of double-entry book-keeping ; science of accounts ; uses of the different books ; admittance of new partners into a business. Closing the ledger and determining the profits and losses are especially dwelt upon. Practice is regularly given in journalizing and posting and drawing up statements showing condition and progress of the business. Attention is paid to the handwriting of the students.

Text-book.—Bryant and Stratton's Double-Entry Book-keeping.

(Class meets three times a week during second term.)

Phonography.—After mastery of the principles, constant practice is given the class by means of dictation, until a fair degree of speed is attained.

Text-book.—Munson's Complete Phonography. New classes are formed when required.

(Class meets twice a week throughout the session.)

Phonography can be taken as an extra or optional study in any of the prescribed courses.

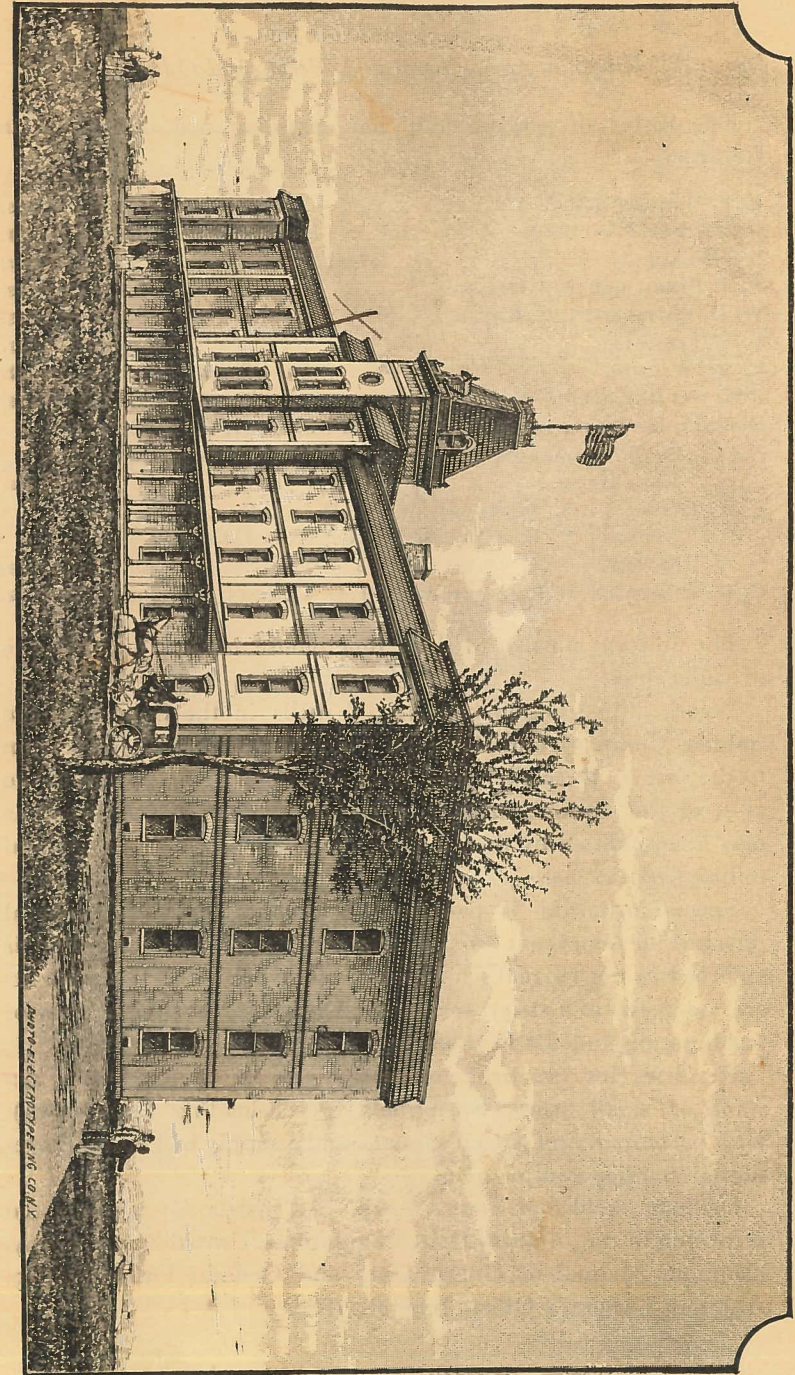
DEPARTMENT OF MILITARY SCIENCE AND TACTICS.

Commandant Harman.

The students are organized into a Battalion of two companies.

The officers and non-commissioned officers of the organization are appointed by the President on the recommendation of the Commandant of Cadets, and are selected from those students who best combine the qualities of high moral character, military bearing, high class standing and general good deportment.

DORMITORIES.



The roster of officers and non-commissioned officers is as follows:

R. E. WRIGHT and A. J. CLAY, Captains.
 J. C. STULL, First Lieutenant and Adjutant.
 J. L. BLACK, First Lieutenant and Quartermaster.
 A. T. FINCH and E. P. MINER, First Lieutenants.
 W. O. FRITH and J. R. KNIBB, Second Lieutenants.
 L. W. JERRELL, Sergeant-Major.
 F. D. WILSON, Quartermaster-Sergeant.
 R. L. WRIGHT and J. F. STRAUSS, First Sergeants.
 G. V. LOVENSTEIN, W. P. WADDY, H. S. GORMLEY, R. N. CREWS,
 A. W. CAMERON, W. B. ELLET, H. B. PRATT and L. H.
 LANCASTER, Sergeants.
 J. W. STEEL, C. A. WHEELER, H. H. WARE, R. I. ROOP, R. C.
 STUART, J. B. CARPER, C. G. GUIGNARD and R. E.
 MOORE, Corporals.
 C. W. ANDERSON, E. P. BEVERLY and T. G. LEWTON, Lance Corporals.

The uniform consists of dark blue blouse and cap and trousers of cadet gray.

Practical instruction consists of drills in the School of the Soldier, Company and Battalion from the opening of the session to the first of December, and from the opening of spring to the close of the session; dress parades and reviews at such times as may be appointed by the Commandant; guard duty and general military discipline.

Special attention is paid to the "setting up" and general physical development of the students. Military discipline is enforced in the barracks and mess. The rooms of the students are subjected to a strict system of inspection, with the view of teaching all students neatness and regular and orderly habits.

Facilities for practical instruction consist of 30 swords, 112 stand of small arms (Springfield breech-loading cadet rifles), with accompanying accoutrements, and a supply of United States Signal Service equipments.

Drills are held four times a week. All instruction is conducted according to the Infantry Drill Regulations, United States Army, Kennon's Manual of Guard Duty and General Order No. 59, Adjutant-General's Office, June 28, 1889.

Theoretical instruction proceeds from December 1st to the opening of spring, in the following subjects: Drill Regulations, School of the Soldier, Company and Battalion Drill and Ceremonies.

Guard Duty—Duties of the Officer of the Day, Officer of the Guard, Non-commissioned Officers and Privates of the Guard.

Visual Signaling—American Morse Code, methods of receiving and transmitting messages.

Military Science—Organization and Administration and Interior Economy of Armies, especially of the army of the United States; Organization of the Militia and National Guard; Preparation of Reports and Returns; Modern Arms; Explosives, including smokeless powders; Grand Guards, Outposts, etc.; Troops in Campaign; Castrametation; Field Works and Fortifications; Siege Operations; Military Law and Court-Martial; Martial Law; Relations of the Civil to the Military; Use of United States Troops as a *posse comitatus*.

Text-books.—Infantry Drill Regulations, United States Army; Kennon's Manual of Guard Duty; United States Signal and Telegraph Code; Califf's Notes on Military Science; United States Army Regulations (Lectures).

AGRICULTURAL EXPERIMENT STATION.

The Experiment Station is made by law a department of the College and placed under the control of its Board of Visitors. The Station is organized as follows:

BOARD OF CONTROL

CAPT. C. E. VAWTER, Crozet.
 HON. J. THOMPSON BROWN, Brierfield.
 MAJOR A. R. VENABLE, JR., Farmville.

STATION STAFF.

J. M. MCBRYDE, Ph. D., LL. D., Director.
 W. B. ALWOOD, Vice-Director, and Horticulturist, Entomologist
 and Mycologist.
 E. A. SMYTH, JR., A. M., Biologist.
 D. O. NOURSE, B. S., Agriculturist.
 R. J. DAVIDSON, A. M., Chemist.
 E. P. NILES, D. V. M., Veterinarian.
 R. H. PRICE, Assistant Horticulturist.
 T. L. WATSON, Assistant Chemist.

The entire farm is devoted to experimental purposes. Several hundred plats are permanently set apart for field experiments. Tests of more than two hundred varieties of vegetables and six hundred varieties of fruits are annually made. Numerous scientific investigations, including chemical analyses, study of injurious fungi and insects and the value of fungicides and insecticides, microscopic examinations of diseased tissues, culture of pathogenic bacteria, experiments in stock feeding, etc., are now in progress.

The tests and investigations of the Station are freely used to illustrate and enforce the principles taught in the class room.

MISCELLANEOUS INFORMATION.

Admission.—The age for admission is fifteen (15) years. Exception is made in the case of two or more brothers—the younger may be somewhat under the required age.

Applicants for admission to the Freshman class must be proficient in English Grammar, Physical Geography, History of Virginia and United States, Arithmetic, and Algebra to equations of first degree.

For entrance into sub-collegiate class a fair knowledge of Elementary Grammar, Geography, History, and Arithmetic is required.

For admission to a higher class an examination on the studies completed by the class will be required.

Applicants must report promptly to President upon arrival.

Entrance examinations will be held during the first week of the session.

Selection of Studies.—Students are required to select one of the prescribed courses of study. Exception will only be allowed for extraordinary reasons, approved by the President.

Where irregularity is permitted the elective course must include the full equivalent of the average theoretical and practical work required in the prescribed courses—sixteen recitations or lectures and fifteen hours of laboratory, shop or field work a week, besides military drill; also English and Mathematics, unless proof is given by examination or certificate of proficiency in these branches.

With the consent of the President one or more optional studies may be carried in addition to the prescribed studies of the course.

Students will be held strictly to the course selected; no change of course being allowed after the first week of the term except for

extraordinary reasons, and in the case of minors only upon written request of parent or guardian.

Attendance.—Attendance upon collegiate duties is rigidly enforced. An unexcused absence from chapel or class subjects the student to the admonition of the Faculty, with notice to parent or guardian, and a repetition of the offence will subject him to such further discipline as the Faculty may order. An unexcused class absence is also counted as zero in the class mark.

Absence from examination can only be excused on the ground of serious indisposition or other weighty cause. Unexcused absence from examination will subject the student to discipline by the Faculty.

Students are not permitted to leave the College without the permission of the President. Applications for leave of absence must be submitted in advance to the President through the Commandant, and also, in case of minors, must be accompanied with the written consent of parent or guardian.

Letters of honorable dismissal will only be granted upon the written request of parent or guardian.

The authority of a parent or guardian to interfere with the work of the College by detaining or excusing the student from any collegiate duty cannot be recognized.

Examinations.—The intermediate examinations are held regularly at the close of the first term; the final examinations at the close of the second term.

Entrance examinations are held during the first week of the session.

Examinations to make up conditions are held only at the times appointed for the regular or the entrance examinations.

Deferred intermediate examinations must be held during the second term and before the final examinations; deferred final examinations must be held at the opening of the next session.

Students excused from the regular examinations have the right to a deferred examination at the times above indicated; students conditioned at a regular examination have the right to re-examination to make up condition only at the opening of the next session.

Special examinations are required to be the equivalents in all respects of those they replace.

Examinations for late entrance can be held at any time during the session by order of the president.

Gradation of Students.—Students are marked on the scale of 100. The term grade in any study is determined by adding the average of the recitation marks to the examination mark and dividing their sum by two: provided, however, that in the result neither factor raises the other more than 10.

The *sessional standing* in any study is simply the average of the grades for the two terms—an excess in the second term being allowed to make up a corresponding deficiency in the first. A *pass* in the second term is, however, always required.

The *general average* for the session is the average of the grades in all the studies for the year; the *graduating mark* or *stand* is the average of the grades in all the studies of the entire course.

Students are classified according to their general average for the session as follows: *Highly distinguished, distinguished, proficient, passed, conditioned, deficient*. Students in the first, second and third of these classes are published in the annual honor lists.

For *highest distinction*, 95 is the grade required; for *distinction*, 90; for *proficiency*, 75; for a *pass*, 60; for a *condition*, 40; for a *deficiency*, 39 or under.

Students averaging *highest distinction* on all the studies of their entire course are graduated with *highest honors*; those averaging *distinction* are graduated with *honors*; those averaging *proficiency* are graduated with *distinction*.

The students of each class or group are published alphabetically. No numerical marks are announced.

Students' Reports.—Reports are made monthly to parent or guardian of the class standing and attendance of the student. A report giving the term grade in each study and the number of excused and unexcused absences from collegiate duties is also sent out at the close of each term.

Degrees.—**BACHELOR OF SCIENCE (B. S.)**.—The requirements for this degree are given under the head of Courses of Study.

MASTER OF SCIENCE (M. S.).—Required, in addition to the degree of Bachelor of Science for the completion of any one of the undergraduate courses, at least one year's resident study, with proficiency in a graduate course of not less than three studies.

CIVIL ENGINEER (C. E.), **MECHANICAL ENGINEER (Mech. E.)**, and **ELECTRICAL ENGINEER (Elect. E.)**.

The requirements for these degrees will be given upon application.

Certificates.—Certificates are given for the completion of the special or two years' courses of study.

A candidate for a degree or certificate must submit to the President on or before April 1st a satisfactory essay or thesis.

Diplomas and certificates will specify the course of study and the graduating mark or average. They are only conferred at Commencement.

Religious Exercises.—Daily morning prayers are held in the chapel, except on Sunday, by the ministers of the several village churches acting as chaplains in turn.

Attendance upon morning prayers, and also upon the Sunday morning service of some one of the village churches, is compulsory on all students.

Library.—The Library contains a few thousand volumes, and is well heated, and lighted by electricity. It is open to the students every afternoon. No fees are charged for its use.

Reading-Room.—One end of the Library is set apart as a reading-room, and fitted up with shelves for periodicals and reading tables. It is supplied with the following choice selection of reviews, magazines, and newspapers:

Its subscription list includes: American Naturalist, The Auk, Botanical Gazette, Entomological News, American Bee Journal, Gleanings on Bee Culture, American Geologist, American Chemical Journal, Journal of Analytical and Applied Chemistry, The

Analyst, Chemical News, American Engineer, Engineering News, Engineering, Engineering and Mining Journal, Weekly Stationary Engineer, Mechanical and Electrical Progress, Electrical Enterprise, Electrical Engineer, Power, Builder and Wood-Worker, American Journal of Mathematics, Veterinarian, Journal of C. M. V. Archives, Journal of Royal Agricultural Society, American Agriculturist, Hoard's Dairyman, Agricultural Gazette, Country Gentleman, Rural New Yorker, Breeder's Gazette, Agricultural Science, American Gardener, Garden and Forest, Nature, Scientific American, Popular Science Monthly, Philosophical Magazine, Science Gossip, Journal of Psychology, Mind, Journal of Education, Academy, Educational Review, Modern Language Notes, Forum, Andover Review, Contemporary Review, Edinburg Review, North American Review, Quarterly Review, Fortnightly Review, Century Magazine, Scribner's Magazine, Nineteenth Century, Blackwood's Magazine, Belgravia, Cornhill Magazine, MacMillan's Magazine, Leisure Hour, Lippincott's Magazine, Atlantic Monthly, Littell's Living Age, London Academy, Cassell's Family Magazine, English Illustrated Magazine, Frank Leslie's Popular Magazine, Harper's Monthly Magazine, Sunday Magazine, Good Words, Nation, Harper's Weekly, Illustrated London News, Graphic, Penny Illustrated Paper, Flügenden Blätter, Fun, Punch, Figaro, Boston Globe, New York Herald, New York Tribune, New York World, Inter-Ocean.

The following are kindly contributed by the publishers:

Southern Planter, Richmond Dispatch (Daily), Norfolk Virginian (Daily), Lynchburg Advance, Richmond State, Roanoke Times, Staunton Spectator, Pulaski News, Fredericksburg Star, Fincastle Herald, Scottsville Courier, Pearisburg Virginian, Newport News Commercial, Rural Messenger, New York Mail and Express, Civil Service Record, Christian Observer, St. Louis Presbyterian.

Buildings and Grounds.—The buildings are mostly of brick. The halls and lecture rooms are large and well lighted. The students' dormitory is a large new building, heated by steam and

lighted by electricity. It is very conveniently arranged. For a description of the laboratories, reference must be made to the statements of the several departments to which they belong. All the buildings are supplied with water brought from excellent springs.

The college grounds contain some 35 acres, and are well set in grass. The walks, drives and young plantations promise in time to make them exceedingly attractive.

Mess.—The mess is under the charge of Mrs. Crockett, a lady of culture and refinement and extensive experience. It is well equipped with china, cutlery and table linen.

The students are under the supervision of the Commandant of Cadets.

The senior cadet officer is superintendent of the mess, and is assisted in his duties by all officers and non-commissioned officers of the battalion organization.

Each table has a seating capacity of ten men, and is governed by a cadet officer, appointed by the Commandant, who is superintendent of the table.

The Commandant, assisted by the superintendents of the mess and tables, assigns cadets to permanent seats, due regard being had for the congeniality of the set at each table.

In the mess room quiet, gentlemanly conduct and good table manners are insisted upon. Every effort is made to surround the students with good influences and home comforts.

Infirmary.—A large and convenient house has been secured as an Infirmary. It stands in the midst of finely-shaded and well-watered grounds. The ward has windows on three sides and abundant space for twelve beds. The Infirmary contains also consulting room, dining room, matron's room, sleeping room, kitchen, etc. It is under the general direction of the College physicians; a competent matron is in immediate charge.

Location.—The College is located in one of the most beautiful sections of Southwest Virginia. It immediately adjoins the town of Blacksburg, is about eight miles distant from the Norfolk and Western railroad, and one hundred miles west of Lynchburg.

Its situation on the summit of the Alleghanies, some 2,100 feet above sea level, secures for it a delightful summer climate. Several of the most popular watering places in the State are only a few miles away. The winters are by no means severe.

The nearest railroad point is Christiansburg depot. There is a daily line of hacks between this depot and Blacksburg. The two places are also connected by a telephone line.

Alumni Association.—The Alumni Association holds its annual meeting during Commencement week.

The officers of the Association are as follows:

S. M. PIERCE,	President.
A. L. HARLESS,	First Vice-President.
R. N. MUSGRAVE,	Second Vice-President.
R. T. BRAY,	Secretary and Treasurer.
R. H. PRICE,	Corresponding Secretary.
ROBERT SNAVELY,	Orator.
R. N. MUSGRAVE,	Alternate Orator.

Literary Societies.—The two Literary Societies of the College—the LEE and the MAURY—are in excellent condition. Their halls are handsomely furnished; their membership is large. Each holds an intermediate and final exhibition, and awards five medals at Commencement—one for improvement in declamation, one for improvement in oratory, one for improvement in debate, one to the best debater at Commencement, and one to the best orator at Commencement. The Maury Society gives an additional medal, its sixth, for improvement in elocution.

Young Men's Christian Association.—The meetings of this Association, held twice a week, are largely attended, and great interest is manifested in its work. It is doing much to advance the religious well-being of the students.

The following are its officers for the present session:

A. W. DRINKARD,	President.
F. D. WILSON,	Vice-President.
J. R. KNIBB,	Treasurer.
R. L. WRIGHT,	Recording and Corresponding Secretary.

Session.—The session begins September 21st and ends the fourth Wednesday in June. It is divided into two equal terms. Twelve days are allowed for the Christmas holidays.

Commencement.—Commencement Day is appointed for the fourth Wednesday in June. The programme of exercises is given in the calendar.

Expenses.—The *matriculation fee* is \$5.

The *infirmary fee* of \$5 covers medical attendance, medicines and nursing. It is exacted of *all* students.

The *contingent fee* of \$5 is a deposit to cover damages. The balance left after assessment for damages is returnable at the close of session. Any damage to room will be charged to the students occupying it. All other damages are assessed *pro rata* upon the contingent deposit of the student body.

The foregoing fees must be paid at entrance.

The *fuel fee* of \$9 covers the charges for steam heating for the session.

The *charge for electric lights* for the session is \$2.70, and for *services of janitor*, \$2.25.

The charges for steam heating, electric lights and janitor are payable, half at the beginning of the first term and half at the beginning of the second.

No charge is made for room-rent, use of library or laboratories. The rooms are furnished with chairs, tables, bedsteads, and washstands. The remaining articles of furniture and bedding must be supplied by the student, and should include pillow-cases, sheets, blankets, mattress, towels, napkins, water and slop-bucket, etc. The bedding should be brought from home.

Table board is furnished at the mess at \$9.00 per month. No deduction in the price is made for absence for any period under one week.

Washing costs about \$1.00 per month.

The *uniform*, consisting of blouse, pants and cap, is furnished at \$16.50 to \$17.50.

The average *cost of text-books* for the session will amount to about \$10.

The expenses of session may, therefore, be estimated as follows :

Fees—	
Matriculation	\$5.00
Infirmary	5.00
Contingent	5.00
Steam-heating	9.00
Electric lights	2.70
Janitor	2.25
Board at \$9.00 per month	81 00
Washing	9.00
Uniform	16.50
Text-books	10.00
	<hr/>
	\$145.45

This sum covers all the expenses of the student except cost of traveling. The student must bring with him a sum sufficient to cover the matriculation, infirmary and contingent fees; the charges for steam-heating, electric lights and janitor for first term; one month's board and washing, uniform, and text-books for first term—about \$60 in all. Subsequent monthly payments for board must be made in advance.

No degree or certificate will be conferred on any student who is in arrears for his fees or other College dues.

No fees of any kind, except the balance left of the contingent fee after assessment for damages, are returned to a student leaving College, for any cause whatever, before the close of the session.

State Students.—An act of the General Assembly, relating to the College, has the following provision :

“A number of students, double the number of members of the House of Delegates, making two hundred, shall have the privilege of attending said College free of tuition, to be selected by the school trustees of the respective counties, cities, and election districts for said delegates, with reference to the highest proficiency and good character, from the free schools of their counties, or, in their discretion, from others than those attending said free schools.”

The appointees must conform to the requirements as to age and preparation set forth under the head of Attendance.

In case of the failure of the School Board or County or City Superintendent to act, application should be made direct to the President of the College.

Where the quota of a county is already filled, after applicants from that county may be accredited by the President to any county in which a vacancy exists.

Preparatory or Sub-Freshman Course.—A preparatory course of study will be offered next session to applicants not sufficiently prepared to enter the collegiate classes. The course will extend over one year, and include English, History, Mathematics, Physical Geography and Elementary Science. For requirements for entrance see Admission.

General Regulations.—No student will be allowed, without express permission from the President, to room or board out of College. Such permission is rarely given and only for exceptional reasons.

Students, before giving or engaging in any pleasure party or celebration, must obtain permission from the President.

Students are not allowed to hold meetings of any kind without the special permission of the President, and then only for the purpose stated in the application.

All speeches or papers prepared by students for public delivery are subject to the revision and approval of the President; also, all programmes for their public celebrations.

Contributions.—To LIBRARY.—Valuable collection of books, containing some 215 bound volumes: From Col. William H. Palmer, Richmond, Va.

TO DEPARTMENT OF MECHANICAL ENGINEERING.—Nest of Headers, showing connections in the Root Tubulous Boiler, Specimens of Spiral Riveted Pipe—Abendroth & Root Manufacturing Company, 28 Cliff street, New York.

Steam Pump—M. T. Davidson, 43 Keap street, Brooklyn.

Sectional Steam Pump—A. S. Cameron Steam Pump Works, New York,

Janney Car Coupler—McConway & Torley Company, Pittsburg, Pa.

Exhibit of Asbestos Packing, Pipe Covering, Millboard, etc.—H. W. Johns Manufacturing Company, 87 Maiden Lane, New York,

Sectional Locomotive Safety Valve—Consolidated Safety Valve Company, 111 Liberty street, New York.

Sectional Steam Gauge—Utica Steam Gauge Company, Utica, N. Y.

Sectional Steam Gauge—Star Brass Manufacturing Company, 31 Lancaster street, Boston.

Sectional Safety Valve, Sectional Steam Gauge—Crosby Steam Gauge and Valve Company, Boston.

Pop Safety Valve, Sectional Pop Safety Valve—The Ashton Valve Company, 271 Franklin street, Boston.

Collection of Tested Steel Specimens, showing the properties of steel—Carnegie, Phipps & Co., Pittsburg, Pa.

Collection of Tested Steel Specimens—The Midvale Steel Company, Philadelphia.

Model of Centrifugal Separator—Joseph DeRycke, 145 Broadway, New York.

Water Meter—Thompson Meter Company—212 Temple Court Building, New York.

Samples of Selden's Packing—Randolph Brandt, 38 Courtlandt street, New York.

Samples of Gould's Steam Packing—The Gould Packing Company, East Cambridge, Mass.

Six pigs of Magnolia Metal—Magnolia Anti-Friction Metal Company, 102 Chambers street, New York.

Samples of Leather Link Belts—American Leather Link Belt Company, 72 Cliff street, New York.

Samples of Leather Belts—Shultz Belting Company, St. Louis, Mo.

Samples of Crescent Steel—Miller, Metcalf & Parker, Pittsburg, Pa.

A large number of plates and blue prints of Marine Engines, Construction and Detail Drawings—Bureau of Steam Engineering, Navy Department, Washington, D. C.

Complete Set of Working Drawings of 18x30, Tangye Buckeye Engine—Buckeye Engine Company, Salem, Ohio.

(This firm is also preparing for us a model of their Valve Gear, a counterpart of the model they intend to exhibit at the World's Fair.)

Several sets of detail drawings of locomotives—Baldwin Locomotive Works, Philadelphia.

Framed photographs of engines and machinery from the following:

Straight-line Engine Company, Syracuse, N. Y.

J. A. Fay & Co., Cincinnati, Ohio.

Lodge & Davis Machine Tool and Manufacturing Company, Cincinnati, Ohio.

Rogers Locomotive and Machine Works, Paterson, N. J.

Ball Engine Company, Erie, Pa.

Westinghouse, Church, Kerr & Co., 17 Courtlandt street, N. Y.

Photographs, blue prints and cuts from the following:

Warner & Swasey, Cincinnati, Ohio.

E. G. Herndon, Esq., with Brown & Sharpe Tool Works, Providence, R. I.

F. E. Reed & Co., Worcester, Mass.

Buffalo Forge Company, Buffalo, N. Y.

William Sellers & Co., Philadelphia.

The Egan Company, Cincinnati, Ohio.

Stilwell & Bierce Manufacturing Company, Dayton, Ohio.

Otto Gas-engine Works, Philadelphia.

Hendley Machine Company, Torrington, Conn.

Russell Davis
To A + M. College
Blackburg Va

Russell Davis
Blackburg Va
To A + M. College



COLLEGE BUILDINGS,
DORMITORIES.

ACADEMIC BUILDING No. 2.

ACADEMIC BUILDING No. 1

Chas. Brooks