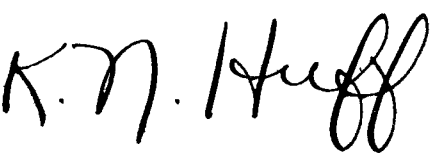
UNIVERSITY OF ILLINOIS.

1890-91.



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LEARNING AND LABOR.

CATALOGUE AND CIRCULAR

OF THE

UNIVERSITY OF ILLINOIS

URBANA, CHAMPAIGN COUNTY, ILL.

(POST OFFICE, CHAMPAIGN, ILL.)

1890-91.

PUBLISHED BY THE UNIVERSITY.

1891.

SEPTEMBER.

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HORNSTEIN BROS., PRINTERS, CHICAGO.

THE UNIVERSITY CALENDAR.
1891-92.

FALL TERM—1891.

Sept. 14, Monday	Entrance Examinations begin.
Sept. 16, Wednesday	First Assembly of Students.
Sept. 17, Thursday	Instruction begins.
Nov. 26, Thursday	Thanksgiving Recess.
Nov. 30, Monday	Instruction resumed.
Dec. 21, Monday	Term Examinations begin.
Dec. 23, Wednesday	Term ends.

WINTER TERM—1892.

Jan. 4, Monday	Extrance Examinations.
Jan. 6, Wednesday	Instruction begins.
Jan 11, Monday	Latest dates for announcing Subjects of Theses for Baccalaureate Degrees.
March 21, Monday	Term Examinations begin.
March 23, Wednesday	Term ends.

SPRING TERM—1892.

March 24, Thursday	Instruction begins.
April 15, Friday	Latest day for presenting Conklin Orations.
April 30, Saturday	Latest day for presenting Commencement Theses and Orations.
May 26, Thursday	Senior Examinations begin.
May 30, Monday	Hazleton Prize Drill.
May 31, Tuesday	Competitive Drill.
June 1, Wednesday	Term Examinations begin.
June 5, Sunday	Baccalaureate Address.
June 6, Monday	Class Day.
June 7, Tuesday	Alumni Day. Conklin Prize Orations.
June 8, Wednesday	Twenty-first Annual Commencement.

FALL TERM—1892.

Sept. 12, Monday	Entrance Examinations begin.
Sept. 14, Wednesday	First Assembly of Students.
Sept. 15, Thursday	Instruction begins.
Nov. 24, Thursday	Thanksgiving recess.
Nov. 28, Monday	Instruction resumed.
Dec. 19, Monday	Term Examinations begin.
Dec. 21, Wednesday	Term ends.

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307 Wright Street, C.

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The Bulletins of the Agricultural Experiment Station will be sent FREE OF CHARGE to any person in the State of Illinois who is engaged in agricultural pursuits, and who will send his name and post office.

Address:

W. L. PILLSBURY, SECRETARY,
Agricultural Experiment Station,
CHAMPAIGN, ILL.

UNIVERSITY OF ILLINOIS.

HISTORY.

The University of Illinois had its origin in a movement for the higher education of the industrial classes, begun in Illinois in 1851, and resulting in the congressional grant of lands for this purpose, made to the several states in 1862, and amounting in this state to 480,000 acres. The University was chartered in February, 1867, and opened to students in March, 1868. In addition to the endowment from the land grant, over $400,000 was donated by Champaign county in bonds, buildings and farms. The state also has made large appropriations for fitting up and stocking the farms, for library and apparatus, and for buildings, including the large main building erected in 1872 and 1873, the mechanical building, the chemical laboratory, and a commodious military building finished in 1890. Successive colleges and courses have been added as required, until four colleges, including fourteen distinct courses, have been organized.

The whole number matriculated as students since the opening is 2,620. The number graduated from the several colleges, including the class of 1890, is 644. In 1871 the University was opened for lady students, on the same terms as to gentlemen. In 1874 a fine art gallery was established.

The University has a beautiful and healthful situation on the high grounds between the cities of Champaign and Urbana, within the corporate limits of the latter. It is one hundred and twenty-eight miles south from Chicago, at the junction of the Illinois Central, the Cleveland, Cincinnati, Chicago and St. Louis, and the Wabash railways. The country is a region of beautiful rolling prairies, with large belts of timber along the streams, and is one of the richest farming districts of the state.

BUILDINGS AND GROUNDS.

The land occupied by the University and its several departments embraces about 610 acres, including stock farm, experimental farm, orchards, forest plantation, arboretum, ornamental grounds, and military parade grounds.

The main University building, designed wholly for public uses, occupies three sides of a quadrangle, measuring 214 feet in front and 122

feet upon the wings. The library wing contains in spacious halls the museum of natural history, the library, the art gallery, and the museum of industrial art. The chapel wing contains the chapel, the physical laboratory and lecture room, and rooms occupied by the departments of architecture and of art and design. In the main front are convenient class-rooms, and on the upper floor, elegant halls for literary societies. The building is warmed by steam.

The mechanical building is of brick, 126 feet in length, and 88 feet in width. It contains a boiler-room, a machine shop furnished for practical use with a steam engine and lathes, and other machinery; pattern and finishing shop; testing laboratory; shops for carpentry and cabinet work, furnished with wood-working machinery. The blacksmith shop contains sixteen forges with anvils and tools, and cupola for melting iron.

The chemical building contains five laboratories, and is one of the best and largest in the United States.

A new military building, erected in 1889-90, 100 by 150 feet in one grand hall, gives ample space for company and battalion maneuvers and for large audiences upon special occasions.

There are, in addition, a veterinary hall, a small astronomical observatory, three dwellings, two large barns, and a greenhouse.

MUSEUMS AND COLLECTIONS.

The museum of zoölogy and geology occupies a hall sixty-one by seventy-nine feet, with a gallery on three sides, and is completely finished with wall, table, and alcove cases. It already contains interesting and important collections, equaled at few, if any, of the colleges of the West. They have been specially selected and prepared to illustrate the courses of study in the school of natural history, and to present a synoptical view of the zoölogy of the state.

Zoölogy.—The mounted *mammals* comprise an unusually large and instructive collection of the ruminants of our country, including male and female moose, elk, bison, deer, antelope, etc.; and also several quadrumana, large carnivora and fur-bearing animals, numerous rodents, and good representative marsupials, cetaceans, edentates, and monotremes. Fifty species of this class are represented by eighty specimens.

The collection of mounted *birds* (about five hundred and fifty specimens of three hundred species) includes representatives of all the orders and families of North America, together with a number of characteristic tropical forms. Many of these specimens are excellent examples of ar-

tistic taxidermy. A series of several hundred unmounted skins is available for the practical study of species.

The set of *skeletons* contains examples of all the orders of mammals and birds except proboscidæ, together with typical representatives of the principal groups of reptiles, amphibians and fishes.

The *cold-blooded vetebrates* are also represented by a very useful collection of alcoholic specimens, plaster casts, and mounted skins of the larger species, both terrestrial and marine.

Embryology is illustrated by a set of Ziegler wax models, and several series of slides, sections and other preparations.

Conchology is illustrated by several thousand shells belonging to seventeen hundred species; together with alcoholic specimens of all classes and orders. The collection of Illinois shells is fair, but incomplete.

The *entomological cabinet* contains about three thousand species (principally American) named, labeled, and systematically arranged.

The *lower invertebrates* are represented by several hundred dried specimens and alcoholics, and by a large series of the famous Blaschka glass models.

Geology.—The geological collection comprises many of the largest and most remarkable fossils hitherto discovered in the various geological formations, illustrating the general progress of life in the mollusks, fishes, reptiles, and mammals, from the oldest palæozoic time to the present. A fine set of fossils from Germany, and collections suitably arranged for practical study, from this and other states, illustrate the different formations. There is a good collection of foot-prints from the Connecticut river sand-stones.

Botany.—The herbarium contains about one thousand species of plants indigenous to Illinois, including nearly complete sets of grasses and sedges. There are, besides, many other North American plants and some exotics. A collection of fungi includes a very full set of those most injurious to other plants, causing rusts, smuts, moulds, etc. A collection of wood specimens from two hundred species of North American trees well illustrates the varieties of native wood. The trees and shrubs of Stephenson county, Illinois, are represented by a distinct collection.

Plaster casts represent fruits of many of the leading varieties, as well as interesting specimens of morphology, showing peculiarities of growth, effects of cross-fertilization, etc.

Lithology.—This collection embraces the principal kinds of metamorphic and volcanic rocks; examples of stratification in the limestone and

fragmental kinds, with many samples of such rocks as are found most valuable for building purposes.

Mineralogy.—The specimens of minerals show all the groups, and all the important and typical species. All the metals are represented, also many of their most important combinations. Many of the specimens are finely crystalized; these, with a complete set of imported models, fully illustrate crystalography.

Agriculture.—A collection of soils from different portions of Illinois and other states; many varieties of corn, wheat, and other cereals and seeds; specimens illustrating the official state inspection of grains at Chicago, showing the quality of the different grades recognized; models of agricultural inventions; models illustrating modes and materials for drains; casts of ancient plows; engravings, lithographs and photographs of typical animals of noted breeds.

The farms give good illustrations of farm buildings, implements, machinery, modes of culture, and of domestic animals of various classes.

Physics.—The cabinets of the physical laboratory contain a collection of apparatus from the most celebrated European and American makers, illustrating the subjects of mechanics, pneumatics, optics, and electricity.

Ample facilities are afforded to students for performing experiments of precision by which the theories of physical science may be tested and original work may be done.

A five-light Weston dynamo at the machine shop is connected with the physical and chemical laboratories for experimental purposes, and is supplemented by a valuable series of instruments for accurate electrical measurements.

A series of standard weights and measures from the office of the Coast and Geodetic Survey of the United States may be consulted at the physical laboratory.

The Mechanical Laboratory is provided with a steam engine, engine and hand lathes, planer, shapers, milling-machine, drill presses, and the requisite hand tools, benches, vises, anvils, etc., for pattern-shop, blacksmith shop, moulding-room, and bench work. Its cabinets contain several hundred models of elements of mechanism and machines from Schroeder, Riggs, the Patent Office, and from the workshops of the University. Important additions to the equipment of tools and machines have lately been made, including a testing machine of most approved design, having a capacity of 100,000 pounds, and a mercury column for accurate testing of water and steam-gauges, and a variety of other apparatus for laboratory investigations.

Mining Engineering is illustrated by a valuable series of models ob-

tained from Freiburg, illustrating sections of mines, machinery for elevating and breaking ore, with furnaces and machinery for metallurgical processes.

An extensive mining and metallurgical laboratory is in process of arrangement. A considerable portion of the machinery is already in working condition.

ART GALLERY.

The University art gallery was the gift of citizens of Champaign and Urbana. It occupies a beautiful hall, 61 by 79 feet, and the large display of art objects has surprised and delighted all visitors. In sculpture it embraces thirteen full-size casts of celebrated statues, including the Laocoön group, the Venus of Milo, etc., forty statues of reduced size, and a large number of busts, ancient and modern, bas reliefs, etc., making over four hundred pieces. It includes also hundreds of large autotypes, photographs, and fine engravings, representing many of the great masterpieces of painting of nearly all the modern schools. Also a gallery of historical portraits, mostly large French lithographs of peculiar fineness, copied from the great national portrait galleries of France. The value of this splendid collection, as a means of education, is shown in the work of the course of drawing and design of the University.

MUSEUM OF INDUSTRIAL ARTS.

A large room is devoted to a museum of practical art, the materials for which are constantly accumulating in the various scientific departments. Prominent among the agricultural specimens here exhibited is an excellent collection of the sub-species and varieties of Indian corn, including the best of their kinds, a considerable collection of small grains and of grasses, a collection of fibers in various states of manufacture, and a series of analyses of grains showing at a glance the elements and proportion of structure. The museum contains full lines of illustrations of the work of the shops; models made at the University or purchased abroad; drawings in all departments; Patent Office models, etc., samples of building materials, natural and artificial; a large collection illustrating the forestry of Illinois, Florida, and California; with whatever may be secured that will teach or illustrate in this most important phase of University work. The elegant exhibit made by the University at the Centennial and Cotton Exposition at New Orleans finds a permanent abode in this apartment.

A notable feature of this collection is the gift of Henry Lord Gay, architect, of Chicago. It consists of a model in plaster, and a complete

set of drawings, of a competitive design for a monument to be erected in Rome, commemorative of Victor Emanuel, first king of Italy. The monument was to be of white marble, an elaborate gothic structure, beautifully ornamented, and 300 feet high. Its estimated cost was to have been seven and a quarter millions of francs. The design was placed by the art committee second on a list of 289 competitors; but both the first and second were set aside for political reasons. Mr. Gay's generous gift occupies the place of honor in the museum of industrial arts.

LIBRARY.

The library, selected with reference to the literary and scientific studies required in the several courses, includes above 20,000 volumes, and additions are made every year.

The large library hall fitted up as a reading room, is open throughout the day for study, reading, and consulting authorities. It is intended that the use of the library shall largely supplement the class-room instruction in all departments. Constant reference is made in classes to works contained in the library, and their study is encouraged or required. The reading room is well provided with American, English, French, and German papers and periodicals, embracing some of the most important publications in science and art.

GEOGRAPHICAL POSITION OF THE UNIVERSITY.

The Observatory has the following position:
Latitude, 40° 6′ 29″.66.
Longitude, west of Washington, 11ˢ 10′ 37″.5. or 44m. 42.5s.
Elevation above sea level, 720 feet.

ORGANIZATION.

The University includes four colleges, and in them are found a variety of distinct courses of instruction, each leading towards some special vocation or profession in life. Courses that are cognate in character are grouped in the same college. Each college is under the supervision of a special faculty.

The following are the colleges and courses:

I. THE COLLEGE OF AGRICULTURE:
- Course in Agriculture.
- Junior Course in Agriculture.

II. THE COLLEGE OF ENGINEERING:
- Course in Mechanical Engineering.
- Course in Electrical Engineering.
- Course in Civil Engineering.
- Course in Mining Engineering.
- Course in Architecture.

III. THE COLLEGE OF NATURAL SCIENCE:
- Course in Chemistry.
- Course in Natural History.

IV. THE COLLEGE OF LITERATURE AND SCIENCE:
- Course in English and Science.
- Course in Latin and Science.
- Course in Ancient Languages.
- Course in Philosophy and Pedagogy.

Additional Courses not distinctly attached to any of the colleges:
- Course in Military Science.
- Course in Art and Design.
- Course in Rhetoric and Oratory.

Vocal and instrumental music are also taught, but not as parts of any regular course.

PREPARATORY CLASSES.

To meet an urgent demand, the Trustees have temporarily provided for teaching the preparatory studies lying between the work of the elementary common schools and that of the University.

COLLEGE OF AGRICULTURE.

FACULTY AND INSTRUCTORS.

SELIM H. PEABODY, PH.D., LL.D., REGENT.
GEORGE E. MORROW, M.A., *Dean*, Agriculture.
THOMAS J. BURRILL, PH.D., Botany and Horticulture.
SAMUEL W. SHATTUCK, C.E., Mathematics.
EDWARD SNYDER, M.A., Modern Languages.
JAMES D. CRAWFORD, M.A., History.
STEPHEN A. FORBES, PH.D., Zoölogy and Entomology.
JAMES H. BROWNLEE, M.A., Rhetoric and Oratory.
CHARLES W. ROLFE, M.S., Geology.
DONALD MCINTOSH, V.S., Veterinary Science.
NATHANIEL BUTLER, JR., M.A., English Language and Literature.
ARTHUR W. PALMER, SC.D., Chemistry.
FRANK F. FREDERICK, Industrial Art.
SAMUEL W. PARR, Analytical Chemistry.
ELBRIDGE R. HILLS, LT. U. S. A., Military Science.
GEORGE W. PARKER, Wood-work.

ADMISSION.

Candidates for admission to the College of Agriculture must be at least fifteen years of age, and must pass satisfactory examinations in the common school branches and in the studies of the preliminary year. While by law students may be admitted at fifteen years of age, in general it is much better that they shall be eighteen or twenty. It will be well if candidates shall have pursued other studies besides those required for admission. The better the preparation the more profitable the course.

OBJECT OF THE COLLEGE.

The aim of this college is to educate scientific agriculturists and horticulturists. The frequency with which this aim is misunderstood, demands that it shall be fully explained. Many, who look upon agriculture as consisting merely in the manual work of plowing, planting, cultivating, and harvesting, and in the care of stock, justly ridicule the idea of teaching these arts in a college. The practical farmer who has spent

his life in farm labors, laughs at the notion of sending his son to learn these from a set of scientific professors. But all this implies a gross misunderstanding of the real object of agricultural science. It is not simply to teach *how* to plow, but the reason for plowing at all—to teach the composition and nature of soils, the philosophy of plowing, of manures, and the adaptation of the different soils to different crops and cultures. It is not simply to teach *how* to feed, but to show the composition, action and value of the several kinds of food and the laws of feeding, fattening and healthful growth. In short, it is the aim of the true agricultural college to enable the student to understand thoroughly all that man can know about soils and seeds, plants and animals, and the influences of light, heat and moisture on his fields, his crops, and his stock, so that he may both understand the reason of the processes he uses, and intelligently work for the improvement of those processes. Not "book farming," but a knowedge of the real nature of all true farming, of the great natural laws of the farm and its phenomena—this is the true aim of agricultural education. Agriculture involves a larger number of sciences than any other human employment, and becomes a fit sequence to any collegiate training.

The steady aim of the trustees has been to give the College of Agriculture the largest development practicable, and to meet the full demand for agricultural education, as fast as it shall arise. Agricultural students are especially invited to the University.

Boards of agriculture and agricultural and horticultural associations are invited to co-operate with the University in its efforts to awaken a more general appreciation of the value of education, and to aid those who desire to avail themselves of its facilities for instruction.

INSTRUCTION.

The instruction unites, as far as possible, theory and practice—theory explaining practice and practice illustrating theory. The technical studies are taught mainly by lectures with readings of standard agricultural books and periodicals, and frequent discussions, oral and written, of the principles taught. These are also illustrated by demonstrations and observations in the fields, stables, orchards, gardens, plant-houses, etc.

SPECIAL STUDIES.

Elements of Agriculture.—Outline of the general principles underlying agriculture in its theory and practice, introductory to the technical and scientific studies of the course.

Agricultural Engineering and Architecture.—Arrangement of the farm; its improvement by mechanical means, as drainage and irrigation; its divisions, fences, hedges, etc.; its water supply; the construction of roads; arrangement, planning and construction of farm buildings; the construction, selection, care, and use of farm implements and machinery.

Animal Husbandry.—Principles of breeding and management of our domestic animals; description of all important breeds and varieties, giving their history and adaptations.

Rural Economy.—Relation of agriculture to other industries and to national prosperity; influences which should determine the class of farming to be adopted; comparisons of special and general systems; uniting of manufacturing with farming; culture of the various farm crops—cereals, grasses, etc.; farm accounts.

History of Agriculture.—Progress and present condition in this and in other countries. Influence of climate, civilization, and legislation in advancing or retarding. Agricultural literature and organizations.

Rural Law.—Business law; laws especially affecting agriculture—tenures of real estate; road, fence, drainage laws, etc.

Elements of Horticulture.—The following topics are discussed: Orchard sites; the age of trees to plant; the season to plant; how to plant; what to plant; the management of the soil; pruning and care of trees; gathering and preserving fruit; diseases and injuries; the nursery; ornamental trees and shrubs; flower gardens; vegetable gardens, including propagating beds and houses; the vineyard and small fruits, and timber tree plantation. Students have instruction and practice in grafting, budding, propagation by cuttings, etc. Each student has usually grafted from two hundred to one thousand root-grafts of apples.

Landscape Gardening.—Lectures are given upon the general principles of the art, the history, and the styles, the kinds and uses of trees, shrubs, grasses, and flowers, the introduction and management of water, the construction and laying out of drives and walks, fences, buildings, etc. The class draw first from copy, then, after the actual study of some locality with its environments, design and draw full plans for its improvement, indicating positions of all prominent objects, including the kinds and groups of trees and other plants. These plans, with specifications, are to be deposited in the library of the school. Excursions are made when found practicable, for the study of public and private grounds.

The three following studies constitute a year's work designed for those who wish to prepare themselves for special horticultural pursuits, and may be taken as substitutes for agricultural or veterinary studies:

Floriculture.—The study of the kinds, propagation, growth, and care of flowering and other ornamental plants. Each student has practice in propagating by cuttings and otherwise, in potting and shifting, and in care of plants requiring various treatments. Insects and diseases, with the remedies, are thoroughly treated, and the means of securing vigor of growth and abundance of flowers are studied and illustrated by practice.

Pomology and Forestry.—Much of the first half of the term is spent in the orchards, nurseries, and forests, making observations and collections, and in the laboratory work determining species, varieties, etc. A large collection of apples, pears, grapes, peaches, etc., is made each year, and the chief characteristics of each are pointed out. Practice is had in making drawings and plaster casts. Written descriptions of the fruits are carefully made and compared with those given in the books, and systems of analysis and classification are put to practical tests. Students see and perform the skilled operations usually practiced in the propagation and growth of trees. Various methods of pruning and training, especially of grapes, are discussed in the class-room, and illustrated upon the grounds. Students study the injurious insects and fungi which cause or accompany diseases of trees and fruits, and the methods of preventing or diminishing their ravages. The native forests of the vicinity and of the country at large are studied as a foundation for the lessons upon the influence and value of timber and other trees and their artificial culture. For the latter, the forest tree plantation on the University grounds, and the aboretum, afford practical illustrations.

Plant-Houses and Management.—This study includes gardening and landscape architecture; the methods of construction, heating and ventilation, and general management, so as to secure, under the different circumstances, the best plant growth. The class-room work consists of lectures and architectural designing and drawing. Illustrations and practice are afforded by the plant-houses of the University.

VETERINARY SCIENCE.

This science is taught during the third year. In the first term the anatomy and physiology of the domestic animals are taught by lectures, demonstrations, and dissections. Post-mortems of healthy and diseased animals are made, so that the students may become practically acquainted with the tissues in health and in disease. The second term is devoted to the study of veterinary medicines, their actions and uses, and to lectures on the principles and practice of veterinary science. During the entire year practical instruction is given in clinical work at the

veterinary infirmary, where animals are treated or operated on free of charge, for the instruction of the students. Lectures are given on veterinary sanitary science and the principles and practice of veterinary surgery.

A veterinary hall and stable have been provided and a clinic is held to illustrate the lectures on veterinary science. The department has Dr. Auzoux's celebrated complete model of the horse in 97 pieces, exhibiting 3,000 details of structure; also *papier maché* models of the foot and the teeth of the horse at different ages.

Students desiring to pursue the study of veterinary science further than is laid down in the agricultural course, will find ample facilities for so doing.

LABORATORY WORK.

Experiments and special investigations by each student. A thesis is required embodying the results of original observation and research.

For details as to the study of botany, chemistry, zoölogy, entomology, geology, and meteorology, see statements in *College of Natural Science.*

APPARATUS.

The college has for the illustration of practical agriculture, a stock farm of 400 acres, provided with a large stock-barn fitted up with stables, pens, yards, etc.; also an experiment farm of 180 acres, furnished with all necessary apparatus to illustrate the problems of breeding and feeding. It has fine specimens of neat cattle, Shorthorns, Herefords, Holsteins, and Jerseys, and of Poland-China swine. The Agricultural Experiment Station, recently established as a department of the University, exhibits field experiments in the testing of the different varieties and modes of culture of field crops and in the comparison and treatment of soils. It includes experiments in agriculture and horticulture, under the direction of the professors of agriculture and horticulture, and experiments in feeding animals of different ages and development upon the various kinds of food. In common with similar departments in the several agricultural colleges of the country, it attempts to create positive knowledge towards the development of an agricultural science.

Surveying and drainage are illustrated by field practice with instruments and by models. Agricultural chemistry, in connection with laboratory practice, is pursued in the analysis of soils, fertilizers, foods, etc. The college has fine collections of soils, seeds, plants, implements,

skeletons of domestic animals, charts, and other apparatus, including a large number of models of agricultural machinery.

Upon the grounds devoted to the use of the college there are:

A very large specimen apple orchard, planted in 1869, and originally containing about 1,000 varieties—many varieties of pears, cherries, grapes, and small fruits.

A forest tree plantation, embracing the most useful kinds of timber.

An arboretum, in which all hardy indigenous and exotic trees are planted as fast as they can be secured, and which now contains nearly 100 varieties. The ornamental grounds which surround the University building contain about twenty acres, and are kept in neat and attractive style. These, with all the adjuncts of trees and flowering shrubs, lawns, beds of flowers and foliage plants, walks of different materials and styles of laying out, give illustration to the class-room work in landscape gardening. A greenhouse contains a collection of plants of great value for the classes in floriculture and landscape gardening, besides furnishing students with practice in greenhouse management.

The cabinet contains a series of colored plaster-casts of fruits prepared at the University; models of fruits and flowers by Auzoux, of Paris; collections of seeds of native and exotic plants; of specimens of native and foreign woods; of beneficial and injurious insects and specimens showing their work; numerous dry and alcoholic specimens and preparations, maps, charts, diagrams, drawings, etc.

The college has a supply of compound microscopes and apparatus, and students have opportunity to learn their use, and to make practical investigations with them. The herbarium is rich in specimens of useful and noxious plants, including many of the fungous parasites which cause disease to cultivated crops.

FULL COURSE IN AGRICULTURE,

Leading to the Degree of B. S.

FIRST YEAR.

1. American Authors; Chemistry; Advanced Algebra.
2. British Authors; Chemistry; Trigonometry.
3. Horticulture; Chemistry; Conic Sections.

SECOND YEAR.

1. Chemistry and Laboratory; Physics; Animal Anatomy and Physiology.
2. Chemistry of Agriculture; Physics; Veterinary Science; Veterinary Materia Medica.
3. Chemistry of Agriculture; Physics; Veterinary Science.

THIRD YEAR.

1. Agricultural Engineering and Architecture; Botany; German or French.
2. Animal Husbandry; Botany or Zoölogy; German or French.
3. Economic Entomology; Vegetable Physiology; German or French.

FOURTH YEAR.

1. Mental Science; Geology; History of Civilization.
2. Rural Economy; Geology; Constitutional History or Pedagogy.
3. History of Agriculture and Rural Law; Physiography, or Astronomy, or Pedagogy; Political Economy.

N. B.—Students in Horticulture will take the special branches in horticulture described on pages 20 and 21.

THE JUNIOR COURSE IN AGRICULTURE.

The course heretofore offered as the FARMERS' SHORT COURSE will be discontinued.

In its place will be offered, beginning with the fall term of 1891, a course covering two years, having in each term an agricultural specialty, with other subjects selected from the preparatory and college courses. Students who wish to enter this course must pass good examinations in the English branches usually taught in the common schools, or must present a County Superintendent's certificate of examination equal to that required for a second grade teacher's certificate. Students in this course should not be less than eighteen years of of age. It is confidently hoped that many persons who wish training in agricultural science but cannot give time for a full course will avail themselves of this opportunity.

A special fee of $5.00 per term will be charged in addition to the other University fees.

JUNIOR COURSE IN AGRICULTURE.

FIRST YEAR.

1. Farm Equipment and Management; Natural Philosophy; Algebra.
2. Farm Animals; Zoölogy; Algebra.
3. Orchard and Garden; Botany; Plane Geometry.

SECOND YEAR.

1. Farm Measurements and Drainage; Animal Anatomy; Chemistry.
2. Farm Crops; Veterinary Science; Chemistry; Shop Practice.
3. Farm Law; Veterinary Science; Entomology.

COLLEGE OF ENGINEERING.

COURSES.

MECHANICAL ENGINEERING; ELECTRICAL ENGINEERING; CIVIL ENGINEERING; MINING ENGINEERING; ARCHITECTURE.

FACULTY AND INSTRUCTORS.

SELIM H. PEABODY, PH.D., LL.D., REGENT.
N. CLIFFORD RICKER, M.ARCH., *Dean*, Architecture.
SAMUEL W. SHATTUCK, C.E., Mathematics.
EDWARD SNYDER, M.A., Modern Languages.
JAMES D. CRAWFORD, M.A., History.
IRA O. BAKER, C.E., Civil Engineering.
JAMES H. BROWNLEE, M.A., Rhetoric and Oratory.
CHARLES W. ROLFE, M.S., Geology.
ARTHUR T. WOODS, M.S., Mechanical Engineering.
ARTHUR N. TALBOT, C.E., Municipal Engineering.
ARTHUR W. PALMER, SC.D., Chemistry.
RUFUS ANDERSON, M.E., Iron Work.
GEORGE W. PARKER, Wood Work.
FRANK F. FREDERICK, Industrial Art and Design.
ELBRIDGE R. HILLS, LT. U. S. A., Military Science.
SAMUEL W. STRATTON, B.S., Physics.
GEORGE W. MYERS, B.S., Mathematics.

ADMISSION.

Applicants should be at least eighteen years of age. None are admitted under fifteen. The requirements for admission embrace the common school branches and the studies of the preliminary year. The examinations in mathematics are especially thorough.

Those who make further preparation than that required before entering can make their course more extensive and profitable. The following suggestions are offered to such as wish to make thorough work:

Either French or German are studied during two years; some preparation in Latin will be of great assistance in these languages. The

engineer and architect should be adepts in the various departments of drawing, and some previous study of this branch will be of great advantage. Faunce's Mechanical Drawing may be used as a text book, and the drawings made on smooth paper, eight by ten inches.

The subjects common to all the courses in the College of Engineering are here described; the topics peculiar to each will be noticed under their specific names.

PURE MATHEMATICS, FIRST YEAR.

Advanced Algebra.—Functions and their notation; series and the theories of limits; imaginary quantities; general theory of equations.

Trigonometry.—Plane and spherical. Fundamental relations between trigonometrical functions of angles or arcs; construction and use of tables; solution of triangles; projection of spherical triangles; angles as functions of sides and sides as functions of angles; general formulas; applications.

Analytical Geometry.—The point and right line in a plane; conic sections, their equations and properties; the tangent and sub-tangent, normal and sub-normal, pole and polar, supplemetary chords, conjugate diameters, etc. Discussion of the general equation of the second degree containing two variables.

PURE MATHEMATICS, SECOND YEAR.

Differential Calculus.—Rules for the differentiation of functions of a single variable; successive differentiation; development of functions; maxima and minima of functions of a single variable; differentials of an arc, plane area, surface and volume of revolution; elementary discussion of higher plane curves; the spirals, logarithmic curve, trochoid, etc.; algebraic curves.

Integral Calculus.—Integration of elementary forms and rational fractions; rectification of plane curves; quadrature of plane areas and surfaces of revolution; cubature of solids of revolution.

Advanced Analytical Geometry.—Loci in space; in point, right line, plane and surfaces of the second order.

Advanced Calculus.—Development of the second state of functions of any number of variables; differential equations; maxima and minima of functions of two or more variables; construction and discussion of curves and surfaces; integration of irrational and transcendental differentials and of differential equations of the higher orders and degree; applications; elements of elliptic integrals.

APPLIED MATHEMATICS.

Analytical Mechanics.—Nature and measure of force; composition and resolution of forces; moments; conditions of equilibrium; resultant of systems of forces; center of gravity; moment of inertia; rectilinear and curvilinear motion and the relation between such motion and the constraining and accelerating forces; dynamics of a rigid body; momentum and impact; work, energy and power; mechanical advantage; friction; application of these principles and methods to the solution of numerous and varied engineering problems.

Resistance of Materials.—Elasticity of materials; stresses and strains; experimental laws; working strength for different materials; resistance of pipes and riveted joints: bending and resisting moment, shear and elastic curve of cantilever, simple, restrained, and continuous beams; column formulas; torsion, and shafts; maximum internal stresses in beams; fatigue of metals; working strength for repeated stresses; resilience; reliability of the common theory of flexure as shown by actual experiment; design and strength of rolled and built beams and columns; specifications for materials and methods of testing.

Hydraulics.—Weight and pressure of water; head; center of pressure, velocity and discharge through orifices, weirs, tubes, pipes, conduits, canals and rivers; measurement of pressure, velocity and discharge; water power.

Projection Drawing.—Use of drafting instruments in the elements of mechanical drawing; geometric constructions; orthographic projection and representation of objects; sections; isometric drawing; cabinet projection and false perspective; use of water colors; conventional signs; drawings finished by line shading and by colors; miscellaneous plans and drawings.

Free Hand Drawing.—Outline sketches; drawing from casts; sketches of machines, etc.

Lettering.—Plain and ornamental alphabets; titles and title pages; round and stump writing.

Descriptive Geometry.—Problems on the point, right line, and plane; single-curved surfaces; double-curved surfaces; development and intersections; shades and shadows; perspective; numerous and varied practical problems requiring the application of these principles and methods.

PHYSICS.

The course of physics embraces the kinds of work following:

1. Recitations, in which a text book is used as a guide.

2. Experiments in the physical laboratory, in which the student uses the instruments in testing the principles taught.

3. Illustrated experiments once each week, in which the more costly apparatus is used before the whole class in such experiments as are difficult to perform, and which are more effective when prepared for an audience.

4. Higher physical experiments by advanced classes, consisting either of researches, or of reviews of careful and elaborate experiments previously worked up by others.

The department of physics is provided with illustrative apparatus for use in the lecture-room, and with an extensive physical laboratory. The collection of instruments embraces acoustic apparatus from R. Koenig, of Paris; apparatus for heat and molecular physics from J. Salleron, of Paris; for light, optics, and electricity from Stoehrer, of Leipsic, and and Browning and Newton, of London; pneumatic and electrical apparatus from E. S. Ritchie, of Boston; and a large number of pieces prepared at the mechanical shops of the University. It includes, also, Browning's electrical lamp; and from Eliot Brothers, and other makers, London, resistance coils, galvanometers, ammeters, and voltmeters for higher researches in electricity.

A room on the ground floor is especially devoted to instruction in electrical measurements.

FRENCH AND GERMAN.

See *College of Literature and Science.*

THESES.

In all the schools in this College a thesis is required as a condition of graduation. It must be an original composition of suitable length, upon a subject appropriate to the school, and approved by the professor in charge. It must be upon regulation paper; must be illustrated with such photographs, drawings and sketches as may be needed; and embellished with a title page neatly printed or lettered with India ink or colors. It will be prepared during the latter part of the fourth year, and presented at the close of the course, after which it will be deposited in the library of the University.

CONTRIBUTIONS.

Our friends and students are invited to send us specimens of material and manufactures, and drawings, models, or photographs of machinery, bridges, and other engineering and architectural work. Finished and detailed working drawings, perhaps otherwise useless, may be of great value for instruction. Illustrated circulars and price lists of manufact-

uring firms are desired. Contributions will be labeled with donors' names, and placed in the museum of industrial arts for the inspection of students and the illustration of lectures.

MECHANICAL ENGINEERING.

OBJECT.

This course is designed to prepare students for the profession of mechanical engineering. It aims to fit them to invent, design, construct, and manage machinery for any branch of manufactures. The state needs men who, to a thorough knowledge of the principles of machinery and of the various motors, add the practical skill necessary to design and construct the machines by which these motors are made to do work.

INSTRUCTION.

The instruction, while severely scientific, is thoroughly practical. It aims at a clear understanding and mastery of all mechanical principles and devices. Practice in the workshop is required as one of the studies of the course.

In *principles* instruction is imparted by lectures, illustrated plates, and text books. Examples are given, showing the application of the theories and principles taught. Experiments in the testing of machines and motors are undertaken by the student.

In *practice* elementary forms are produced and projects are executed, in which the student constructs machines, or parts thereof, of his own designing, and from his own working drawings.

In *designing* the student begins with elements and proceeds with progressive exercises till he is able to design and represent complete machines.

MECHANICAL ART AND DESIGN.

A scheme of elementary shop practice has been carefully arranged, to familiarize the student with the forms of the parts of machines, and the mode of producing them. He is made familiar with all the ordinary cutting tools for iron or wood; with the form and condition for most effective work; with the machines and appliances by which they are put in action, and the instruments by which desired dimensions of product are obtained. This practice is obtained in the mechanical laboratory, and represents five different shops, viz:

1—PATTERN MAKING.
2—BLACKSMITHING.
3—FOUNDRY WORK.
4—BENCH WORK FOR IRON.
5—MACHINE TOOL WORK FOR IRON.

In the 1st, the practice consists in planing, turning, chiseling, etc., in producing true surfaces in various forms in wood, and also in combining pieces by glue joint, etc., preliminary to correct pattern making; patterns are finally made from which are cast pieces in iron, brass, etc., to be worked in the subsequent shops.

In the 2d, the student uses the forge and performs the various elementary operations, such as drawing, upsetting, bending, welding, etc.

In the 3d, the processes of moulding and casting are fully illustrated.

In the 4th, there is first a course of free-hand bench work, the cold chisel and file being the only tools. After the hand and eye are sufficiently trained, fitting is begun, and the square, bevel, rule, compasses, and other auxiliary bench tools are used. Pieces are then fitted together by the file, with surfaces carefully finished.

In the 5th shop, the ordinary machine tools of the machine shop are used. The first practice employs these machines with their cutting tools or bits, in common operations, such as turning cylinders, discs, grooves, and fillets; boring, drilling, hand-turning, milling, planing, etc. Following this is a course of practice in fitting and finishing, in which calipers, rules, etc., are introduced, and many of the various fittings employed in machinery are produced.

Previous to the shop-work, drawings of the pieces are made by the student, and the exact thing to be done is indicated; thus mistakes are avoided and practice facilitated.

The designing of such machine elements as pulleys, journal boxes, cranks, stuffing boxes, etc., cultivates a knowledge of proportion, and of its proper representation on paper. This course of elementary practice fits the student for the advanced shop practice in designing and construction of complete machines undertaken later in the course.

SPECIAL STUDIES.

Principles of Mechanism.—Relative motion of points in a system of connected pieces; motion independent of force; velocity ratio; investigation of motion of elementary parts of machines, as friction and non-circular wheels in rolling contact, cams and curves in sliding contact; teeth of wheels; spur, bevel, and screw gearing; link-work; quick-return motions; escapements; trains of mechanism; epicyclic trains; straight line motions.

Heat Engines.—The theories of air, gas, and steam engines; discussion of the various types; efficiency; proportions of steam boilers.

Hydraulic Engines and Wind Wheels.—Water-pressure engines; turbines and other water wheels; principles of design and efficiency.

Theory of wind wheels; types and methods of governing; applications and comparative economy.

Machine Drawing.—Detailed designs of machines in whole or in part, such as link and valve motions, governors, steam boilers and engines, hydraulic presses, etc, with due consideration of strength, economy of construction, accessibility for repairs, etc.

Mill Work and Machinery.—Methods of transmitting power; calculations for shafting, gearing, pulleys, belts, chains, wire or hemp rope; efficiency of various modes of transmission; best forms for long and short distances.

Dynamo-electric Machinery.—The theory of dynamos and motors; principles of design; discussion of different types; efficiency; methods of governing; electric distribution of power; long distance transmission.

PROJECTS AND PRACTICE.

The shop practice of the first year has already been described. The second-year practice has for its object the production of some model or machine. The students, under the immediate direction of the teachers, carefully determine the dimensions and shapes best suited for the parts of some machine, produce them in neat and accurate working drawings, and make tracings for shop use. No student will commence his advanced shop practice without working drawings. The designs are such as require execution in iron, brass, and wood, for the purpose of giving variety of practice. The student is required to make the patterns and castings, finish the parts, and put them together in accordance with the working drawings and the required standard of workmanship. This acquaints him with the manner in which the mechanical engineer carries his design into execution, and teaches him so to shape, proportion, and dispose the parts of a machine as to secure the greatest economy of construction and durability in use. The practice of the third year includes the careful construction of mechanical movements, strictly in accordance with the theoretical determination of the form of the parts.

The steam engine, large drill press, one engine lathe, the hand lathes, the milling machine, and other machinery now in use, were designed here, and built in the shop by students in the department.

Besides these practical exercises, students of sufficient skill may be employed in such commercial work as is undertaken by the shop.

Experiments and Practical Problems.—Experiments in the testing of prime movers and other machines, are undertaken by the students. They take indicator diagrams from the engines of the mechanical laboratories, analyze them, and by means of the friction brake determine the

loss in engine friction. They make evaporative tests of boilers and determine the percentage of moisture in the steam by the use of the calorimeter.

APPARATUS.

This department is provided with plates and a cabinet of models illustrating mechanical movements and elementary combinations of mechanism. This collection is rapidly increasing by our own manufacture, and by purchase from abroad. It includes many of Riggs's models, and others from the celebrated manufactory of J. Schroeder, of Darmstadt, Germany. About two hundred valuable models from the United States Patent Office are also included in the cabinet.

The state has provided a large mechanical laboratory and workshop, furnished with complete sets of tools, benches, vises, and forges, with flasks for moulding in sand, and cupola for melting iron.

STUDIES.

The studies are given by the year and term in the tabular view of the course. The order there indicated should be closely followed, that the student may avoid interference of his hours of recitation.

COURSE IN MECHANICAL ENGINEERING,

Leading to the Degree of B.S.

FIRST YEAR.

1. Advanced Algebra; Projection Drawing; French or German; Shop Practice.
2. Trigonometry; Descriptive Geometry and Lettering; French or German; Shop Practice.
3. Analytical Geometry; Advanced Descriptive Geometry; French or German; Shop Practice.

SECOND YEAR.

1. Differential Calculus; Physics; French (optional); Mechanical Construction.
2. Advanced Analytical Geometry; Physics; French or German (optional); Mechanical Construction.
3. Integral Calculus; Physics; French or German (optional); Mechanical Construction.

THIRD YEAR.

1. Analytical Mechanics; Chemistry; Mechanism.
2. Resistance of Materials; Chemistry; Engineering Materials.
3. Mill Work; Hydraulics; Chemistry or Geology or Astronomy.

FOURTH YEAR.

1. Mental Science; Heat Engines; Machine Drawing.
2. Constitutional History; Hydraulic Engines and Wind Wheels; Estimates.
3. Political Economy; Dynamo-Electric Machinery; Machine Drawing.

ELECTRICAL ENGINEERING.

The University is now prepared to offer, as a second course in the department of Mechanical Engineering, a full course of Electrical Engineering. The first two years of this course will be identical with those of Mechanical Engineering, which evidently furnishes the only rational foundation upon which an electrical course may be built. The mechanical course has already offered such an amount of instruction in electrical specialties as has enabled its graduates to take service promptly and efficiently in electrical work. A well equipped electrical laboratory will be open in the fall term, with dynamos, motors, batteries, and all forms of instruments for the theoretical and practical discussion of the subject in all its phases, for measuring electric forces, and for testing electric apparatus.

COURSE IN ELECTRICAL ENGINEERING,

Leading to the Degree of B.S.

In the first and second years, this course is identical with the course in Mechanical Engineering.

THIRD YEAR.

1. Analytical Mechanics; Chemistry; Mechanism.
2. Resistance of Materials; Chemistry; Engineering Materials.
3. Mill Work; Hydraulics; Dynamo-Electric Machinery.

FOURTH YEAR.

1. Mental Science; Heat Engines; Electric Measurements.
2. Constitutional History; Hydraulic Engines and Wind Wheels; Electrical Laboratory.
3. Political Economy; Electrical Transmission of Power; Electrical Laboratory.

CIVIL ENGINEERING.

OBJECT.

The design is to furnish a course of theoretical instruction, accompanied and illustrated by a large amount of practice, which will enable the student to enter intelligently upon the various and important duties of the civil engineer.

INSTRUCTION.

While the instruction aims to be practical by giving the student information and practice directly applicable in his future professional work, the prime object is the development of the mental faculties. The power to acquire information and the ability to use it, is held to be of far greater value than any amount of so-called practical acquirements. The method of instruction consists in coupling the development of intellectual power with the acquisition of information directly useful to the civil engineer in his profession.

The instruction is given by lectures, text books and reading, to which are added numerous problems and practical exercises, as will serve best to explain principles completely and fix them in the mind. Models and instruments are continually used, both in lectures and by the students themselves.

APPARATUS.

For Field Practice.—The school is provided with the instruments necessary for the different branches of engineering field practice, including chains, tapes, compasses, plane tables, stadias, transits, levels, barometers, base rods and comparing apparatus, sextants, engineer's transits arranged for astronomical observation, and solar compass attachments for transit.

A portable altitude and azimuth instrument of the latest and best form, from the celebrated makers, Troughton & Simms, of London, is used for instruction in geodesy and practical astronomy. It is read by micrometer microscopes to single seconds, both of altitude and of azimuth. The astronomical observatory is provided with an equatorial telescope, an astronomical transit, with attachment for zenith telescope work, a chronometer, and a set of meteorological instruments.

To facilitate practice in surveying, an area has been specially prepared in which the difficulties of plane surveying are presented to the beginner as he is able to meet them, and where he is taught practical methods of overcoming them. All possible distances, directions, areas, and elevations are accurately known; hence the instructor knows beforehand the precise result which the student should obtain. Not a single problem or exercise is given in which there is wanting an absolute check upon the accuracy of the work. This is an incentive to the student and enables the teacher to show him the degree of accuracy attained and also to point out errors.

For the Lecture Room.—The school has numerous models for illustrating its specialties, including models of bridges, roofs, joints, and

connections; a large collection of drawings, photographs, and photo-lithographs of bridges, roofs, and engineering structures, numerous railway maps, profiles, etc.; maps of government surveys, and plans and specifications. It has access to a complete set of lithographs of the lectures and drawings used in the government polytechnic schools of France. The industrial museum contains a large collection of building materials, of wood, brick, stone, and iron. The testing laboratory has a machine with a capacity of a hundred thousand pounds for tension, compression, or bending; also a cement testing machine.

The library is well supplied with the best and latest periodicals and books upon engineering subjects, to which the students have full access.

PRACTICE.

In the fall term of the second year the class solves numerous problems in distances, areas, etc., using the chain, compass, and plane table. During the winter term the students have practice with all the engineering instruments and solve problems with the transit, stadia, level, and sextant. In the spring term the class makes a topographical survey of a locality, using the stadia and plane table as in the United States surveys.

In the fall term of the third year the class executes a project in railroad engineering, which consists of preliminary surveys, location, staking out, drawings, computation of earth-work, etc. The preliminary survey consists in an examination of the locality, and in running tangent lines, with leveling and topographical sketching. The location consists in running the line over the route decided upon, with all the necessary measurements and calculations for establishing the grade, setting slope stakes, etc. The drawings include alignment, profile, etc.

In the fall of the fourth year the student has practice with the alt-azimuth instrument in reading horizontal and vertical angles; and in determining latitude; with the astronomical transit in finding time; with the sextant in getting time and latitude; with the aneroid and mercurial barometers in measuring heights, and with the precise level in leveling.

SPECIAL STUDIES.

Astronomy.—Descriptive astronomy is given with a text book. The equatorial telescope is in constant use during favorable weather. Practical astronomy is given by lectures and the use of the alt-azimuth instrument, the astronomical transit, the sextant, and the engineer's transit, adapted to astronomical calculations. The work includes the use and adjustment of instruments, and the determination of time, latitude, longitude, and azimuth.

Bridges.—The instruction in bridges occupies two terms. The first is devoted to the calculations of the strains in the various forms of bridging, by algebraic and graphical methods, consideration being given to weights of bridge and train, and force of wind. The second is devoted to designing trusses, proportioning sections, and working out of details. Each student designs and makes a full set of drawings of a bridge.

Geodesy.—From a text book studies are made upon the instruments, methods, formulas, etc., employed in spirit, barometrical, and trigonometrical leveling; the apparatus, methods, etc., used in measuring base lines; the location and construction of stations; the method of measuring the angles and reducing the triangulations; the principles of projecting maps; the means employed in running parallels and meridians.

Land Surveying.—Areas and distances by chain, compass, and plane table; U. S. public land surveys, including legal points involved in the re-establishment of boundaries; magnetic variation and determination of true meridian.

Masonry Construction.—Requirements and methods of testing stone, brick, cement, and lime; composition, preparation and strength of mortar and concrete; classification, construction, strength, cost of stone and brick masonry; foundations under water; theory of stability; cost, etc., of dams, retaining walls, bridge piers, bridge abutments, culverts, and arches.

Railroad Engineering.—Instruction is given from text books and by field practice. In the former are studied the principles of economic location, particularly the effect of distance, grade, and curve upon operation; the inter-adjustment of grades and curves; also the mathematical theory of curves, turn-outs, crossings, and the calculation of earth-work. In field work the class makes at least two preliminary surveys and one location of a short line, of which each student is to present a complete set of notes, calculations, maps, etc.

Topography.—Use of stadia, plane table, and level in topographical surveying. Topographical drawing includes sketching, platting field notes, conventional signs, and city and county maps.

Theory of Engineering Instruments.—Examination of workmanship and design; testing instrument makers' adjustments; making engineer's adjustments; determination of areas with transit; inaccessible and air line distances with transit; profiles and practice with level; heights and distances with stadia; measurements of angles with sextant, etc.

Sewerage.—Sewerage systems ; water-carriage systems, separate and

combined; determining size and capacity of sewers to carry off storm water and for house drainage alone; design and construction of sewers and sewer appurtenances; sewage disposal by chemical precipitation, filtration, irrigation, etc.; estimates and specifications.

Hydraulics.—Weight and pressure of water; head; velocity and discharge through orifices, weirs, tubes, pipes, conduits, canals, and rivers; measurement of pressure, velocity, and discharge; water power; water-works engineering; pumping plant, mains, stand-pipes, and reservoirs; sources of supply; impurities and their removal.

Roads and Streets.—Location, construction, and maintenance of earth roads. Examination of the relative merits of gravel, broken stone, brick, stone blocks, wood, and asphalt as road surfaces. Specifications and details of construction of the various forms of street pavements, curbs and gutters, side walks and cross walks. Street cleaning.

COURSE OF STUDY.

The complete course occupies four years. The several subjects included therein are shown in the list below. Each study requires five recitations per week, and should receive daily from three to four hours of the student's time. Some of the class exercises occupy one hour daily, while others require two hours; as a rule the latter require less time for preparation. The order of studies as given by the year and term in the tabular view of the course, should be closely followed to avoid interference in hours of recitation, and because the studies are there given in the order which best meets the preparation of the student.

COURSE IN CIVIL ENGINEERING,

Leading to the Degree of B.S.

FIRST YEAR.

1. Advanced Algebra; Projection Drawing; Shop Practice; French or German.
2. Trigonometry; Descriptive Geometry and Lettering; French or German; Shop Practice.
3. Analytical Geometry; Advanced Descriptive Geometry; French or German; Shop Practice.

SECOND YEAR

1. Differential Calculus; Physics; French (optional); Land Surveying.
2. Advanced Analytical Geometry; Physics; French or German (optional); Theory of Instruments.
3. Integral Calculus; Physics; French or German (optional); Topography.

THIRD YEAR.

1. Analytical Mechanics; Chemistry; Railroad Engineering.
2. Resistance of Materials; Chemistry; Roads and Streets.
3. Astronomy; Hydraulics; Chemistry or Geology.

FOURTH YEAR.

1. Mental Science; Geodesy; Masonry Construction.
2. Constitutional History; Bridge Analysis; Sewerage.
3. Political Economy; Bridge Construction; Mine Attack.

MINING ENGINEERING.

OBJECT.

This course has been provided to meet the growing demand of a very important industry for thoroughly trained engineers; fitted to solve the numerous perplexing problems which are constantly arising in all mining work. The subjects of the discovery, opening, economical working and proper ventilation of mines, the prevention of accidents, transportation above and below ground, treatment of products, with many others which fall within the scope of the mining engineer, can be mastered only by a careful study of facts and principles. This is the proper foundation for the practical work of the profession, and it is the aim to present this in the most complete and thorough manner.

INSTRUCTION.

It is important that a broad basis be laid by way of general preparation for the more technical studies here included. Whatever of general culture the student may obtain before entering the University, will not come amiss, and, although the requirement is not made, it is advised that all who can do so should acquire a reading knowledge of French or German before beginning this course.

The course comprises the greater part of the pure and applied mathematics of the course in mechanical and civil engineering. Much time is devoted to chemistry and geology, with the addition of metallurgy and other technical studies peculiar to mining engineering.

Students who are graduated from this course are not supposed to be familiar with all the details of mine management from actual experience, but they will have obtained such a knowledge of the principles underlying all sucessful practice, and such a familiarity with the science of mining in all its branches, that the art may be acquired with the minimum of practice.

Lectures are given when desirable, but these are to be regarded as supplementary to other modes of instruction which are made to conform

as closely as possible to the routine of the engineer in practice. In every detail the student is made to feel that he is dealing with the actual problems which he will meet in his professional work.

Plans, estimates, drawings, reports, and calculations, based upon data obtained in the student's own experience, are constantly required, and no pains is spared to familiarize each member of the class with the duties and responsibilities of every grade, from miner to manager.

COURSE OF STUDIES.

In the first two years the work is similar to that required in the course in civil engineering, but more time is given to chemistry. In the third year geology and mining engineering, with assaying and metallurgy, take the place of special technical studies in the other engineering courses. In the fourth year, with the exception of two terms of prime movers taken with the students in mechanical engineering and some studies of general character, the work is strictly technical.

SPECIAL STUDIES.

Mine Surveying and Reconnoitering.—History, uses and adjustments of instruments; solar compass and various solar attachments; practical problems involving the running of surface lines and lines under ground; connecting of surface and underground surveys; practice of U. S. deputy surveyors. Details of mine surveys, setting of bench marks; lines through shafts, drifts, stopes, etc.; keeping of records, plans, etc. Surveys required to determine best locations for test borings, shafts, adits, etc.; methods of reconnoitering.

Mining Engineering.—1. Attack.—Tools, implements, machinery, and explosives, with principles governing their use. Methods of boring, sinking, and driving through hard, soft, wet, dry, loose, or compact material.

2. *Timbering.*—Objects, methods, etc.; framing, fitting, bracing.

3. *Transportation*—Underground haulage, hoisting, use of chutes; apparatus and appliances, cars, tracks, switches, cables, cages, motive power, connections; haulage in inclines, "man-engines," etc.

4. *Drainage.*—Pumps, pumping, sumps, ditches; drainage of working shafts and inclines.

5. *Ventilation.*—Means and appliances. Importance of subject; laws of various states and countries. Discussion of fundamental principles and practical applications, with results.

6. *Buildings and Machinery.*—Hoisting apparatus, air compressors, power drills, etc.

7. *Exploration.*—To determine general character and extent of deposits in advance of development; methods and aims.

8. *Development.*—Blocking out of deposits to prove values of partly explored ground, and to prepare for further explorations.

Exploitation.—Laying out work; winning of coal, ore, etc.; stoping, overhand and underhand; winzes and intermediate levels; economical handling of product. Methods to be employed under various conditions.

Dislocations.—Faults, upthrows, downthrows, feeders, leaders, rolls, swells, etc. Means of overcoming difficulties.

Dressing of Products.—Coal screening and washing; sampling and grading ore; assorting, crushing, spalling, cobbing, concentrating.

Mining Machinery.—Elements of construction, designing of plant, combination of parts; setting, arranging, adjusting. Preservation and operation, general economy.

Organization.—Economy of management. Secondary superintendence; division of labor and adjustment of responsibility. Prevention of accidents.

Administration.—Review of principles. System of reports from subofficers, and tabulation of records. Accounts, forms, analyses, pay-rolls, cost sheets, etc. Letting and measuring contracts. Miscellaneous details.

Engineering Geology.—Applications of geology to engineering and mining. Nature and distribution of deposits of economic value, as coal, water, metallic ores, etc.; advanced structural geology and lithology; discussion of principles underlying successful working of mines, placing of foundations, setting of machinery, and erection of structures in various situations. Relation of geological structure to drainage, economy of working, selection of points of attack, methods of exploration, etc.

APPARATUS.

The department has a valuable collection of models of mining and metallurgical machinery.

The newly equipped laboratory now contains a very complete line of illustrative machinery, designed for practical use, and covering a wide range of metallurgical processes. The machines are operated by steam power, and include apparatus for crushing, screening, washing, concentrating, leaching, precipitating, and many other methods of ore treatment of the latest modern types.

In the manipulation of these machines, and the tests made on a working scale, the student is afforded opportunity for practice illustrative of the class-room work. The plant consists of a Dodge ore-crusher, a pair of Cornish rolls, elevator with deflecting spouts, automatic sampler, re-

volving screens, separators, rotating table, jigs, etc.; chlorine generator, tanks, vats, and troughs, gas and blast furnace, with suitable appliances so arranged that they may be used together or separately as occasion may require.

The extensive apparatus of other departments is equally available for this.

COURSE IN MINING ENGINEERING,

Leading to the Degree of B.S.

FIRST YEAR.

1. Advanced Algebra; Projection Drawing; Chemistry; French or German.
2. Trigonometry; Descriptive Geometry and Lettering; Chemistry; French or German.
3. Analytical Geometry; Free-hand Drawing; Chemistry; French or German.

SECOND YEAR.

1. Land Surveying; Differential Calculus; Physics.
2. Theory of Instruments; Advanced Analytical Geometry; Physics.
3. Topographical Surveying; Integral Calculus; Physics.

THIRD YEAR.

1. Mine Attack; Analytical Mechanics; Mineralogy.
2. Geology; Resistance of Materials; Assaying.
3. Geology; Mining Surveying; Metallurgy.

FOURTH YEAR.

1. Mining Engineering; Heat Engines; Mental Science.
2. Engineering Geology; Hydraulic Engines and Wind Wheels; Constitutional History.
3. Mining Engineering; Mine Administration; Political Economy.

ARCHITECTURE.

OBJECT.

The design is to prepare students for the practice of the profession of architecture. A thorough knowledge of scientific principles applied to construction, ability and refined taste in design, a technical acquaintance with the processes of the various building trades, and some skill in the use of tools, are necessary for this, and are made prominent objects of the course of instruction.

The course of study comprises the theory and practice of construction, the history and esthetics of architecture, draughtsmanship, and the usual work of office practice, so far as this can be taught in a professional school. Technical instruction is imparted by recitations from text books,

lectures, and especially by the application of principles to practical cases; engravings, photographs, and models are employed as illustrations.

Drawing is practiced during the entire course, and designing is introduced early, so that original work is done whenever possible. Drawing from casts and modeling in clay give command of the hand, facility in sketching, and a knowledge of beautiful forms.

Shop practice comprises elementary forms and joints in carpentry and joinery, and experience in cabinet-making and turning, as well as the construction of models of architectural structures at a reduced scale.

SPECIAL STUDIES.

Elements of Drawing.—Lectures; designs for specified problems; outline sketches and finished drawings from casts, in pencil, crayon, charcoal, etc.

Water Color Painting.—Practice in elementary landscape painting and sketching from nature in water colors.

Wood Construction.—Materials and tools; frames, floors, roofs, ceilings, domes, heavy frames, roof trusses, stairs, doors, windows, cornices, etc.; external and internal finish.

Stone Construction.—Materials, mortars, and cements; concrete; walls, foundations, arches, and vaults; tools and processes of stone-cutting.

Brick Construction.—Material, bonds, walls, arches, vaults, centerings, terra cotta, tiles.

Metal Construction.—Manufacture and uses of cast iron, wrought iron, and steel; forms employed in construction; connection by joints, rivets, pins, etc.; columns, lintels, girders, and beams.

Tinner's Work, Slating, Plastering, etc.

Sanitary Construction.—Principles of sanitary science; plumbing, water supply, and sewerage; uses of engineering; instruments in surveys for drains, buildings, etc.

Architectural Drawing.—Preparation of a set of drawings as practiced in offices; conventional coloring; drawing the orders; finishing drawings in line, ink, sepia, and color; architectural shades and shadows.

Architectural Perspective.—Study and application of the practical methods explained in Ware's Perspective; original designing in perspective applied to practical problems.

Architectural Designing.—Original sketches and finished designs for specific projects. Several problems are given each term, progressing from simple to complex. Drawings neatly finished in shade and colors.

History of Architecture.—Careful study of the leading historical styles, their derivation, characteristics, construction, applications; most im-

portant monuments of each style. Especial prominence is given to those ideas in design which might be useful and suggestive in the development of American architecture.

Esthetics of Architecture.—Study of principles of esthetics as applied to architecture and allied arts; proper treatment of building materials and of the different portions of a building, as well as of its general form; problems requiring original designs.

Estimates.—Methods of measuring builders' work; cost of labor and materials; preparation of estimates for numerous practical examples.

Agreements and Specifications.—Study of principles and examples; preparation of a set of papers for letting contracts for building.

Heating and Ventilation.—Heat, production, losses through walls; flow of air in ducts; obstructions; heating by fireplaces, furnaces, stoves, steam, and hot water. Ventilation, requirements and methods; application to numerous problems.

Graphical Statics.—Elements; equilibrium polygon and its applications; loads and wind pressures on roofs; typical forms of roof trusses; examples; determination of strains in members, sectional dimensions and details of connections at the joints; construction and use of graphical tables.

SPECIAL EXERCISES.

Specimen plates or tracings are required of each student at the close of each term in drawing or designing, to form a part of his record. These must be made in accordance with the materials and dimensions prescribed, and be finished as directed.

SHOP PRACTICE.

To give a practical knowledge of various kinds of work, three terms are devoted to a course of instruction, which all architectural students are required to pursue, unless they have previously had equivalent practice and obtain credit therefor.

First Term.—Carpentry and Joinery. Planing flat, square, and octagonal prisms and cylinders; framing with single, double, and oblique tenons; splices, straight and scarfed; mitre, lap, and gained joints; through and lap dovetails; mouldings, mitres, mitre-box, and panels.

Second Term.—Turning and Cabinet-making. Glue-joints; mouldings; inlaying; ornamental veneering; turning cylinders, balusters, ornamental forms, capitals, rosettes, vases, etc.

Third Term.—Construction of portions of buildings or of complete architectural structures at a reduced scale; roof trusses, stairs, frames of wooden buildings, etc., made from drawings.

APPARATUS.

A collection of casts donated by the Spanish government, and another of casts of various architectural details from Lehr, of Berlin, belong to the department of Architecture and Design; models of ceilings, roof trusses, stairs and Schroeder's models of joints in wood-work and of construction in cut stone-work, in the engineering museum.

The department of Architecture possess a large and rapidly increasing collection of engravings and photographs illustrating the history of architecture and art and their practical applications in all ages. The collection is mounted on about 5,000 cards, 11x14 inches, and is classified in two parts, one for the use of the class in history of architecture, the other for use by the various classes in designing; both series are minutely subdivided to facilitate easy reference, and are always open for free use, thus forming a most valuable working library. The plates issued by the most important American architectural journals are to be found here.

The casts, photographs, etc., of the art gallery. In the University Library are many of the best English, German, French, and American architectural works and periodicals.

A large and well-equipped carpenter and cabinet shop containing cabinet benches and sets of fine tools for class in shop practice; foot and power lathes; machine saws, planer, moulder, tenoner, shaper, jig saw, etc.

The use of the large testing machine, capacity 50 tons.

COURSE IN ARCHITECTURE,

Leading to the Degree of B.S.

FIRST YEAR.

1. Advanced Algebra; Projection Drawing; French or German; Shop practice.
2. Trigonometry; Descriptive Geometry and Lettering; French or German; Shop Practice.
3. Analytical Geometry; Advanced Descriptive Geometry; French or German; Shop Practice.

SECOND YEAR.

1. Differential Calculus; Physics; French (optional); Wood Construction.
2. Advanced Analytical Geometry; Physics; French or German (optional); Stone, Brick and Metal Construction.
3. Integral Calculus; Physics; French or German (optional); Sanitary Construction.

THIRD YEAR

1. Analytical Mechanics; Chemistry; Architectural Drawing.
2. Resistance of Materials; Chemistry; History of Architecture; Architectural Drawing.
3. Graphical Statics; History of Architecture; Astronomy or Geology, or Drawing and Modeling.

FOURTH YEAR.

1. Mental Science; Esthetics of Architecture; Architectural Perspective.
2. Constitutional History; Designing; Heating and Ventilation.
3. Political Economy; Designing ; Estimates and Specifications.

BUILDERS' COURSE.

The Trustees permit persons desiring to fit themselves for foremen and builders to take a course of a single year, pursuing only the selected studies of the architectural course prescribed in the following course of study.

For admission to the builders' course, students must pass the examinations in English grammar, arithmetic, geography, and U. S. history, but are not required to pass in the studies of the preliminary year, unless they wish to pursue studies other than those prescribed in the following list. A special fee of $5 per term is charged in addition to the other University fees.

BUILDERS' COURSE OF STUDY.

1. Wood Construction; Projection Drawing; Shop Practice (Carpentry and Joinery).
2. Stone, Brick, and Metal Construction; Architectural Drawing; Shop Practice (Stair Building).
3. Graphical Statics; Architectural Designing; Shop Practice (Cabinet Making.

This course will not be continued after the college year ending June, 1892.

COLLEGE OF NATURAL SCIENCE.

COURSES.

CHEMISTRY, NATURAL HISTORY.

FACULTY AND INSTRUCTORS.

SELIM H. PEABODY, PH.D., LL.D., REGENT.
STEPHEN A. FORBES, PH.D., *Dean*; Zoölogy and Entomology.
THOMAS J. BURRILL, PH.D., Botany and Horticulture.
SAMUEL W. SHATTUCK, C.E., Mathematics.
EDWARD SNYDER, M.A., Modern Languages.
JAMES D. CRAWFORD, M.A., History.
JAMES H. BROWNLEE, M.A., Rhetoric and Oratory.
CHARLES W. ROLFE, M.S., Geology.
ARTHUR W. PALMER, SC.D., Chemistry.
FRANK F. FREDERICK, Industrial Art.
SAMUEL W. PARR, M.S., Analytical Chemistry.
SAMUEL W. STRATTON, B.S., Physics.
ELBRIDGE R. HILLS, LT. U.S.A., Military Science.
M. R. PARADIS, M.A., French.
HOWARD S. BRODE, Asst. in Zoölogy.
HARRY S. GRINDLEY, B.S., Asst. in Chemistry.
ROBERT W. CORNELISON, B.S., Asst. in Chemistry.

ADMISSION.

Candidates for the College of Natural Science should be eighteen years of age, and must pass satisfactory examinations in the common school branches, and in the studies of the preliminary year.

Their preparations should be especially good in the scientific studies of the preliminary year. Practice in the drawing of natural objects will greatly facilitate the student's progress. A knowledge of the Latin language is a good preparation for the mastery of the scientific terms which must be learned in the course.

CHEMISTRY.

This course aims to impart such knowledge of chemistry as will enable the student to apply the principles of the science to the related

arts, and as will fit him for original research, or for business of the druggist, pharmaceutist, and practical chemist.

INSTRUCTION.

The first term of the first year is occupied by text-book instruction, lectures, and experiments in the laboratory illustrating the elementary principles of chemistry, chemical physics, and inorganic chemistry. The second term is devoted to a closer consideration of the metallic elements and their compounds, and the laboratory practice consists of a study of such reactions as constitute the basis for chemical analysis. In the third term the subject of qualitative analysis is completed, and the student has practice in the preparation of various inorganic salts, etc. Recitations continue throughout the next three years, and with the work in the laboratory constitute two hours daily work, for five days each week. Before graduation, each is required, before the end of his course, to make an original investigation, and present a thesis.

Students who pursue chemistry as a part of other courses work two consecutive hours daily, during such time as their specialties may require.

Deposits.—At the beginning of each term of laboratory practice, each student will deposit ten dollars with the business agent of the University. At the end of the term, the balance left, after deducting payment for chemicals and apparatus used, will be refunded.

Five courses of laboratory work have been arranged, as follows :

CHEMICAL COURSE.

FIRST YEAR.

First Term.—General, theoretical, and applied chemistry. Lectures, text book, and illustrative experiments in the laboratory.

Second Term.—General chemistry continued. Chemical reactions and tests. Qualitative analysis begun.

Third Term.—Principles of chemical philosophy. Qualitative analysis completed. Inorganic chemical preparations.

SCCOND YEAR.

First Term.—Advanced inorganic chemistry. Qualitative analysis of salts of known composition. Volumetric analysis. Acidimetry and alkalimetry.

Second Term.—Advanced inorganic chemistry. Assaying. Dry and wet assays of gold, silver, lead, zinc, and copper ores. Electrolytic depositions, etc.

Third Term.—Agricultural chemistry. Qualitative analysis of feldspar, milk, grain, fertilizers, etc.

THIRD YEAR.

First Term.—Organic chemistry. Principles and practice of organic synthesis. Preparation of organic compounds.

Second Term.—Organic chemistry. Organic preparations.

Third Term.—Organic chemistry. Ultimate organic analysis. Determinations of vapor densities, etc.

FOURTH YEAR.

First Term.—Detection of poisons, organic and inorganic. Gas analysis.

Second Term.—Theoretical chemistry. Investigations for thesis.

Third Term.—Theoretical chemistry. Thesis work completed.

PHARMACEUTICAL COURSE.

FIRST YEAR.

Same as in chemical course throughout the year.

SECOND YEAR.

First Term.—Same as in chemical course.

Second Term.—Quantitative analysis of commercial drugs, bismuth subnitrate, tartar emetic, sodium bicarbonate, potassium iodide, sodium bromide, cream of tartar, ammonium carbonate, potassium nitrate. Volumetric determinations.

Third Term.—Same as in chemical course, substituting materia medica for agricultural chemistry.

THIRD YEAR.

First Term.—Same as in chemical course.

Second Term.—Isolation and quantitative estimation of active proximate principles of vegetable drugs—oils, resins, gums, alkaloids, glucoses, etc.

Third Term.—Practice of Pharmacy. Reading and compounding prescriptions. Preparation and valuation of tinctures, extracts, syrups, etc. Examination of commercial organic drugs.

FOURTH YEAR.

First Term.—Analysis of urine, normal and pathological. Examination of waters, mineral and potable. Alcoholic liquors, proprietary articles, etc.

Second Term.—Toxicology. Micro-chemistry of poisons. Separation of poisons from organic mixtures.

Third Term.—Original research. Thesis.

COURSE IN AGRICULTURAL CHEMISTRY.

A. Arranged for students who desire to make a specialty of chemistry in its application to agriculture and allied branches.

FIRST YEAR.

Same as in chemical course.

SECOND YEAR.

First Term.—Same as in chemical course.

Second Term.—Lectures and class work in agricultural chemistry. Analysis of feldspar, soils, ash of plants, drain waters.

Third Term.—Agricultural chemistry. Analysis and valuation of commercial fertilizers and manures, and material used for manures, apatite, phosphates, guanos, nitrates, ammonia salts, animal matters, and potash salts.

THIRD YEAR.

First Term.—Proximate analysis of farm products and cattle foods; grain, roots, fodders, commercial foods, etc.

Second Term.—Analysis of milk, butter, and cheese. Determination of sugars by polariscope and by titration. Examination of alcoholic liquors.

Third Term.—Original research.

B. Arranged especially for regular students in the school of agriculture.

FIRST YEAR.

Same as in chemical course.

SECOND YEAR.

First Term.—Same as in chemical course.

Second Term.—Agricultural chemistry. Lectures and class work. Analysis of feldspar, soils, plant ash, fertilizers and manures, and the materials used in their productions; phosphates, nitrogenous matters, and potash salts.

Third Term.—Agricultural chemistry. Lectures and class work. Analysis of farm products—grains, roots, fodders, commercial foods, milk, butter, and cheese.

METALLURGICAL COURSE.

FIRST YEAR.

First Term.—Same as in chemical course.

Second Term.—Same as in chemical course.

Third Term.—Same as first term, second year chemical course.

SECOND YEAR.

First Term.—Analysis of ores, iron, manganese, zinc, copper, lead, nickel, etc.

Second Term.—Assaying. Same as in chemical course, (Students who pursue this term's work must have had one term of mineralogy.)

Third Term.—Analysis of refractory materials, fluxes and slags.

THIRD YEAR.

First Term.—Gas analysis. Same as in chemical course. Study of furnace gases.

Second Term.—Analysis of fuels—wood, anthracite and bituminous coals, coke; determination of heating power.

Third Term.—Analysis of cast iron, wrought iron, and steel. Determinations of sulphur, silicon, manganese, phosphorus, and the forms of carbon.

The above course has been arranged for students desiring to make a specialty of chemistry in its application to metallurgy. For students in the course of Mining Engineering the work of the first year described, together with the following, is presented:

SECOND YEAR.

First Term.—Analysis of ores—iron, zinc, copper. Analysis of crude metals—iron, determination of sulphur, silicon, manganese, phosphorus, and the forms of carbon.

THIRD YEAR.

Second Term.—Assaying, same as in chemical course, third term. Metallurgy, with laboratory practice. Analysis of fluxes, slags, fuels, etc.

APPARATUS.

A large laboratory building, 75 x 120 feet, and four stories in height, is devoted to this specialty.

The basement contains furnace room for assaying and metallurgical operation; a mill room for storing and crushing ores; and a large room for the manufacture of chemicals and pharmaceutical preparations. The first story contains a lecture room capable of seating 200 persons, and a qualitative laboratory large enough to accommodate 152 students; one hundred and four desks are now fitted, each having an evaporating hood, gas, and water. There are a spectroscope table, a blow-pipe table for general use, and a store-room stocked with apparatus and chemicals. The second story, designed for the use of advanced students, has the following apartments: A lecture room with mineralogical cabinet, and furnace models for illustrating lectures on metallurgy; laboratory for students in agricultural chemistry; large laboratory for quantitative analysis, now containing sixty-four desks; a balance room,

containing chemical balances of the manufacture of Bunge (short beam), Becker & Son, Troemner; a pharmacy, furnished like a drug store, with shelves, drawers, prescription desk, balance, graduates, etc., and containing a full set of drugs and pharmaceutical preparations made in the laboratory by students in pharmacy; private laboratory for instructors; a gas analysis room, entirely cut off from the system of heating and ventilating, to avoid undue fluctuations of temperature, furnished with a table specially constructed, and containing a full set of Bunsen's gasometric apparatus, an inductive coil, battery, mercury, etc.; and a storeroom with apparatus for all kinds of work in quantitative analysis.

The apparatus for general use includes a large platinum retort for the preparation of hydrofluoric acid; a Geissler's mercurial air pump; Hoffman's apparatus for illustrating the composition of compound gases; a Soliel-Scheibler's saccharimeter; an excellent set of areometers; a Hauy's goniometer; a camera with Ross lenses; a Ruhmkorff's coil; galvanic batteries; a galvanometer; a spectroscope; microscopes; gas combustion furnaces for organic analysis, etc.

On the mansard floor ample provision has been made for the study of photography.

COURSE IN CHEMISTRY,

Leading to the Degree of B.S.

FIRST YEAR.

1. Chemistry, General and Applied; Advanced Algebra; Drawing; French.
2. Chemistry, with Laboratory Practice; Trigonometry; Drawing; French.
3. Chemistry, with Laboratory Practice; Conic Sections; Drawing; French.

SECOND YEAR.

1. Chemistry, with Laboratory; Physics; German.
2. Chemistry, with Laboratory; Physics; German.
3. Chemistry, with Laboratory; Physics; German.

THIRD YEAR.

1. Organic Chemistry, with Laboratory; Mineralogy; Physiology or Botany.
2. Organic Chemistry, with Laboratory; Botany: German of Science.
3. Organic Chemistry, with Laboratory; German of Science.

FOURTH YEAR.

1. Chemistry, with Laboratory; Mental Science; Geology.
2. Theoretical Chemistry, with Laboratory; Constitutional History, or Pedagogy, or Logic.
3. Theoretical Chemistry, with Laboratory; Political Economy; Physiography, Astronomy, or Pedagogy.

Students who are candidates for the degree of B.S. in the Course of Chemistry must perform the laboratory work as laid down in some one of the prescribed chemical courses.

NATURAL HISTORY.

The Course in Natural History is especially intended to provide a general preparation for the professions and business pursuits requiring more of an acquaintance with the methods and facts of science than with those of literature. More specifically it is designed:

To afford a thorough and liberal education with a basis in the sciences and modern languages.

To prepare for the teaching of the natural history subjects either in the higher schools or as a professional specialty.

To lay a liberal foundation in biological work and study for a course in medicine.

To prepare for the pursuit of specialties in zoölogy, botany, general biology, and geology, as a scientific career.

The natural history course of four years leads to the degree of bachelor of science. It is distinguished by unusually full instruction in the biological subjects and in the other modern sciences, combined with a thorough course in French and German. It offers two hours a day for a year in botany, and the same each in zoölogy and general or special biology; a term each of entomology, human anatomy, and physiology, microscopy, and mineralogy; two terms of geology and three of physics; a year of chemistry; a term each of physiography and astronomy; a year each of free-hand drawing and French; five terms each of German and history; one term each of advanced algebra, trigonometry, conic sections, political economy, mental science, and logic; and the equivalent of twenty-nine weeks' work for one hour a day, in practical English composition and oratory.

In zoölogy, botany, general biology, entomology, geology, microscopy, chemistry, and mineralogy, the subjects are developed by a thorough course of laboratory work and practice by the students, done under the guidance and criticism of an instructor, supplemented by lectures and the study of text.

The biological work of the senior year is rendered so far elective in character that it may be made to lead towards the study of medicine, natural history teaching, or the pursuit of a special scientific career.

Special and elective study is permitted and provided for, but does not lead to a degree.

Graduates in literary courses who wish also the advantages of a scientific course, may pursue elective work, or may usually take in two years the degree of bachelor of science by carrying the scientific studies of the course alone.

SPECIAL STUDIES.

Botany —Candidates for admission are examined upon Gray's Lessons in Botany, or an equivalent, and are expected to be able to analyze common wild flowers. Beginning with the fall term of the sophomore year, systematic and structural botany is continued by recitations, illustrated lectures, and laboratory work upon fresh, dried, and alcoholic specimens. Students, throughout the course, are required to observe for themselves, and to make notes and drawings of their investigations. A series of these drawings, upon a uniform scale, together with the accompanying descriptions, is deposited in the laboratory. Each student provides himself with suitable pencils, drawing pens, paper, needles in handles, glass slides for mounting objects, and a razor for making thin sections.

The first half of the fall term is devoted to the study of the natural orders of flowering plants, their geographical distribution, importance, etc., together with a history of a few special plants and their products. During this time, students analyze in the laboratory flowering plants of the more difficult orders, compositæ, gramineæ, etc., especially such as are best obtained in autumn. During the last half of the term the general morphology of plants, including vegetable anatomy and histology, is studied, practical laboratory work with the microscope being the basis of the instruction.

The special morphology of the great divisions of the vegetable kingdom, their chief characteristics, their classifications, and the identification of species of flowerless plants, constitute the work of the second term. Special attention is given to injurious fungi. Aquaria furnish numerous kinds of fresh water algæ, and the greenhouses supply specimens in nearly all the groups studied.

Vegetable Physiology is studied in the third term. The instruction is given by lectures or text-book, and by experimental practice. The work includes : The food of plants and its absorption and assimilation ; fluids, their kinds, uses, causes of movement, transpiration, respiration, etc.;

processes, peculiarities and results of growth; relations and effects of temperature, light, gravitation, etc.; self- and cross-fertilization, movements, "sleep of plants," tendrils, climbing vines, etc.

For illustration the University has a collection of about one thousand species of the plants indigenous to the State of Illinois, including a very nearly complete set of the grasses; a collection of Rocky Mountain and western plants; and many others obtained by exchange from various parts of the United States. A collection of fungi contains numerous species. The greenhouses and out-door plantations furnish a large amount of illustrative material for the classes. Enlarged *papier maché* models of flowers and fruits, exhibiting structure and development, are in the cabinet.

Throughout the course the attempt is made to introduce the students to the literature of the various subjects and to acquaint them with the authorities for the facts stated.

Microscopy.—Students have in this study further practice in the use of the compound microscope, the management of light for particular purposes, the testing of lenses, measurement of magnifying powers and angles of aperture, drawing and photographing objects, the preparation and mounting of material, etc. The application is mainly, but not exclusively, devoted to vegetable tissues and products.

The special aim is to afford the opportunity of gaining a skillful and rational use of the instrument, and an acquaintance with the best methods and processes of preparing and mounting objects. Students provide themselves with slides and covers, needles, forceps, brushes, and razors. Microscopes, section cutters, turn tables, etc., are furnished by the University.

About thirty compound microscopes represent the best American and European makers.

Anatomy and Physiology.—The students admitted to this class have already passed an entrance examination in the elementary principles of anatomy and physiology. They have also had a year's training in zoölogy, which makes a free use of the facts of comparative anatomy possible, and aids greatly in the work of the course.

The main objects of the course are to make the student familiar with the position, structure, and healthy action of those organs most liable to become diseased; to make plain the part which the nervous system plays in both the healthy and morbid action of the various organs, and in the problems of nutrition and energy.

The subject is taught during the fall term of the junior year. The plan embraces lectures, recitations from the text book, frequent read-

ings from standard authors, and demonstrations from fresh dissections, alcoholic specimens, microscopical preparations, skeletons, and the manikin.

Zoölogy.—The object of the zoölogical course is primarily to give the students command of the methods of zoölogical research and study, and to derive from these their distinctive discipline. The subject is taught ten hours a week during the whole of the sophomore year, the course being based throughout on individual work in the zoölogical laboratory, and in the field.

The more important features of the work are comparative dissections, descriptions, drawings, and microscopic preparations of types of the greater groups, as a basis for the study of the sub-kingdoms and their more important divisions; lectures on the comparative physiology of selected forms, with especial reference to their relations to their environments, organic and inorganic, present and past; studies of the zoölogical classifications, commonly introduced by analytical synopses, exhibiting the technical relations of groups; lectures and elaborate reviews directed especially to the general system of homologies by which zoölogical science is organized as a coherent whole; a course of lectures in general embryology, given with principal reference to the descent of animals, and as a preparation for later work in special embryology; and lectures on the history of zoölogical science and its final generalizations.

The *general biology* of the senior year includes comparative histology of animals, and the embryology of the chick; in plants, development and reproduction in the various groups of cryptogams and phanerogams and bacteriology.

The library and collections of the University are supplemented by those of the State Laboratory of Natural History, and of the State Entomologist, to which the students in this department have access.

Entomology.—The study of entomology, pursued during a single term of the freshman year, is necessarily made largely empirical and practical, the subject to which it is principally directed being the place of insects in the general system of organic life; and, incidentally to this, the relations of insects to the interests of man.

The foundation for a knowledge of structural entomology is laid by the discussion and detailed study of a typical insect; and for that of the orders, by a generalization of the characters of selected groups of specimens representing each.

A large part of the time is devoted to the study of the characters, life histories, habits, and economic relations of a selected list of especially important insects. Specimens of these in their different stages,

together with synopses and descriptions of the families to which they belong, are furnished the students, and the essential facts, not discoverable by direct observation, are given in lectures or acquired by study of text.

Practice in field observation is given as opportunity offers, and all are taught the ordinary methods of the collection, preparation, and care of specimens, together with the approved methods of controlling the ravages of the injurious species.

A personal study, continuous for the term, of the life history and habit of some insect species, is made by each student and is finally reported in the form of a thesis.

In both field and laboratory work, an extraordinary opportunity is offered to competent students of this course to observe and assist in practical entomological work and original research.

Geology.—The course in geology covers a period of twenty-two weeks, two hours daily. The scheme of instruction comprises: The study of a series of localities in which great surface changes have recently taken place, in order to discover the characteristics of the forces which produced the changes and the tool-marks by which their action in former times may be traced.

The mineral composition of the different kinds of rocks; the changes produced in their composition by the action of underground water; the conditions under which each species was formed and the relation between these conditions, and the structure of the resulting rock; a series of analyses covering most of the varieties of crystalline and sedimentary rocks, and the collection and identification of such erratics as can be obtained from the drift.

A somewhat rapid review of the qualities and distribution of those substances found most useful in the arts, together with the conditions which have produced them.

A study of the sub-divisions of geologic time as laid down in Dana's Manual, with the physical and organic changes which characterize them, and the distribution of the rocks laid down during each period.

An analytical study of the larger groups of fossils, with many of the more common genera and species.

A second course of eleven weeks, two hours daily, is offered to students from the chemical, civil engineering, and language courses, in which the entire subject is outlined; detailed study is made of a few of the more important points, and some acquaintance with both rocks and fossils is gained.

A third course, one hour daily for eleven weeks, for students in mining,

is devoted entirely to a detailed study of the origin, qualities, and distribution of substances having economic value.

Mineralogy.—Fourteen weeks; about six are occupied in lectures on crystallography; Nauman's system of symbols is used and explained. A collection of models, comprising the most important forms and combinations in the various systems of crystalization, is used for illustration and study. The remainder of the term is occupied by the descriptive determination of minerals, and the use of the blowpipe. The cabinet of minerals contains a valuable and extensive collection of leads of the state, and a very considerable collection of other minerals, American and foreign.

Physiography.—This name is given to the work in a term of the senior year. The purpose is to gather the lines of investigation previously followed in the development of the physical and natural sciences into a consistent whole, culminating in a natural history of the earth and its inhabitants, including anthropology; an account of the past and present distribution of plants and animals; and an explanation of the general phenomena of meteorology and climatology.

COURSE IN NATURAL HISTORY,

Leading to the Degree of B.S.

FIRST YEAR.

1. Chemistry; Advanced Algebra; Drawing; French.
2. Chemistry; Trigonometry; Drawing; French.
3. Chemistry; Conic sections; Drawing; French.

SECOND YEAR.

1. Botany; Physics; German.
2. Botany; Physics; German.
3. Vegetable Physiology; Physics; German.

THIRD YEAR.

1. Zoölogy; Mineralogy; Physiology.
2. Zoölogy; Constitutional History; German of Science.
3. Zoölogy; Entomology; German of Science.

FOURTH YEAR.

1. Biology; Geology; Mental Science.
2. Biology; Geology; Logic or Pedagogy.
3. Biology; Physiography or Pedagogy; Political Economy.

In this course three terms of University Latin will be accepted in lieu of the three terms of French; and five terms of such Latin for the five terms of German.

COLLEGE OF LITERATURE AND SCIENCE.

COURSES.

ENGLISH AND SCIENCE. LATIN AND SCIENCE. PHILOSOPHY AND PEDAGOGY.
ANCIENT LANGUAGES.

FACULTY AND INSTRUCTORS.

SELIM H. PEABODY, PH.D., LL.D., REGENT.
EDWARD SNYDER, M.A., *Dean;* Modern Languages.
THOMAS J. BURRILL, PH.D., Botany.
SAMUEL W. SHATTUCK, C.E., Mathematics.
JAMES D. CRAWFORD, M.A., History.
STEPHEN A. FORBES, PH.D., Zoölogy and Entomology.
JAMES H. BROWNLEE, M.A., Rhetoric and Oratory.
CHARLES W. ROLFE, M.S., Geology.
NATHANIEL BUTLER, JR., M.A., English Language and Literature.
ARTHUR W. PALMER, SC.D., Chemistry.
FRANK F. FREDERICK, Industrial Art.
ELBRIDGE R. HILLS, LT. U.S.A., Military Science.
CHARLES DEGARMO, PH.D., Psychology.
HERBERT J. BARTON, M.A., Latin.
M. R. PARADIS, M.A., French.
CHARLES M. MOSS, M.A., Greek.
FANNY M. RYAN, Latin.

ADMISSION.

Candidates for the courses of English and Science and of Latin and Science will be examined in algebra, geometry, natural philosophy, physiology and botany, and Latin but not Greek.

Candidates for the course of Ancient Languages will be examined in Greek, but not in botany, physiology or natural philosophy.

Students desiring to enter the College of Literature and Science must pass the examinations in preparatory Latin before they can be matriculated.

OBJECT OF THE COURSES.

The object of the courses in this college is to furnish sound and liberal education to fit students for the general duties of life, and especially to prepare them for those business pursuits which require a large measure of literary and scientific knowledge and training. They meet the wants of those who wish to prepare themselves for the labors of the press as editors and publishers, for teachers in the higher institutions, or for the transaction of public business.

INSTRUCTION.

The plan of instruction embraces, besides the ordinary text-book study, lectures and practical exercises in all the departments, including original research, essays, criticism, and other work intended to illustrate the studies pursued, and to exercise the student's own powers.

A prominent aim will be to teach the right use of books, and thus to prepare the students for self-directed investigation and study, which will extend beyond the curriculum of his school and the period of his graduation. With this view, constant use of the already ample and continually enlarging stores of the library will be required and encouraged.

The *Library* is well supplied with works illustrating the several periods of English, American, French, and German literature, as also those of ancient literature. It contains at present over twenty thousand well selected volumes, and is constantly growing by purchase at home and abroad. Valuable American and foreign periodicals are received regularly in the reading room.

The following subjects are common to the courses of this College and may be appropriately described in this place:

MATHEMATICS.

First Term.—Advanced Algebra.—Functions and their notation; series and the theories of limits; imaginary quantities; general theory of equations. Topical reviews of all preceding algebraic processes.

Second Term.—Trigonometry, plane and spherical; fundamental relations between the trigonometrical functions of an angle or arc; relations between the functions of different angles or arcs; construction and use of tables; solution of triangles; angles as functions of sides, and sides as functions of angles; applications.

Third Term.—Conic sections, geometrical method. Definitions and general properties of the ellipse, hyperbola, and parabola; curvature

of the conic sections; elements of analytical geometry. Properties and relations of the point and right line in a plane; of the conic sections.

PHYSICS AND ASTRONOMY.

See College of Engineering, page 26.

NATURAL SCIENCE.

See College of Natural Science, page 47.

HISTORY AND SOCIAL SCIENCE.

The historical studies are designed to afford a general view of the history, social organization, and progress of the race. They embrace also the history of the arts and sciences, and of civilization, the principles of civil polity and law, the philosophy of history, and the principles of political economy and constitutional law.

The course occupies six terms in the junior and senior years of the University course.

JUNIOR YEAR.

History of Greece and Rome, and of other ancient nations; Ancient Geography; Mediæval History; Modern History; European Geography.

SENIOR YEAR.

Constitutional History of England and the United States; History of Civilization; Political Economy.

ENGLISH AND SCIENCE.

ENGLISH LANGUAGE AND LITERATURE.

In the arrangement of the studies the endeavor is to present a thorough and extended drill in grammatical and philological study, and in the authors and history of the English language, affording a training equivalent to the ordinary studies of the classical language. This drill extends through three years of the course.

The first two terms of the first year are given to a general survey of the whole field of British and American literature from the middle of the sixteenth century to the present time. All the representative writers come into notice, and representative specimens from the writings of each are carefully read in class. Moreover, each student is required each term to read an entire work of some classic author, making choice from a prescribed list. Frequent exercises in writing abstracts, or original compositions on themes assigned, are also required. The study of rhetoric occupies the third term.

During the second year a few of the great masters are studied, their work analyzed, and the shaping forces of their times, with their influences upon succeeding times, are investigated. Lectures are given from time to time on topics relating to the class work. Writing and reading required as in first year.

In the senior year the first term is devoted to early English (A. D. 500-1200), for which the way has been prepared by the study of both English and German. In the second term the study of middle English (A. D. 1200-1500) is taken up, and during the third term philology is studied. Essays, forensics, and orations are required.

French and German.—The course in modern languages in this school embraces two years of French and two years of German. The chief aim is mastery in translation and composition, constant attention being also given to the etymologies common to these languages and the English; the study is thus made to contribute to the student's knowledge of his own tongue, and to the power of expression in the same.

In the first year the student completes the study of a grammar and reader, acquiring a knowledge of the technicalities of the idiom, with a vocabulary sufficient for the use of books of reference in his course. The second year is devoted to a course of select reading and composition, involving a critical study of the languages and their literature.

French and German are used in the class room as a means of conversation, as far as practicable, but this is made subordinate to the main purpose, which is to enable the student to read the languages with ease rather than to speak them indifferently.

COURSE IN ENGLISH AND SCIENCE,

Leading to the Degree of B.L.

FIRST YEAR.

1. American Authors; Advanced Algebra; French; Drawing.
2. British Authors; Trigonometry; French; Drawing.
3. British Authors; Conic Sections; French; Drawing.

SECOND YEAR.

1. English Classics; Physics; German; Drawing (optional).
2. English Classics; Physics; German; Drawing (optional).
3. English Classics; Physics; German; Drawing (optional).

THIRD YEAR.

1. History, Ancient; Chemistry; Physiology or Botany.
2. History, Mediæval; German; Zoölogy or Botany.
3. History, Modern; German; Geology or Astronomy.

FOURTH YEAR.

1. History of Civilization; Mental Science; Early English or Geology.
2. History, Constitutional; Logic; Middle English, or Pedagogy.
3. Political Economy; Civics, or History of Philosophy; Philology, or Pedagogy.

LATIN AND SCIENCE.

Under this head a course is offered to such as desire to make a special study of the Latin language, without being required to take Greek also. In other respects the subjects in this course are similar to those in the course in English and Science.

COURSE IN LATIN AND SCIENCE,

Leading to the Degree of B.L.

FIRST YEAR.

1. Cicero de Amicitia; Advanced Algebra; French; Drawing.
2. Livy; Trigonometry; French; Drawing.
3. Horace, Odes; Conic Sections; French; Drawing.

SECOND YEAR.

1. Horace, Satires; Physics; German; French (optional, fourth).
2. Terence; Physics; German; French (optional, fourth).
3. Tacitus; Physics; German; French (optional, fourth).

THIRD YEAR.

1. Latin, or History; Chemistry; Physiology or Botany.
2. Latin, or History; German; Zoölogy or Botany.
3. Latin, or History; German; Astronomy.

FOURTH YEAR.

1. History of Civilization; Mental Science; Early English, or Geology.
2. History, Constitutional; Logic; Middle English or Pedagogy.
3. Political Economy; Civics, or History of Philosophy; Philology or Pedagogy.

ANCIENT LANGUAGES.

Instruction in the Course of Ancient Languages and Literature, while aiming to impart a sufficiently full and critical knowledge of the Latin and Greek languages and writings, makes the study of these tongues subservient, in a more than usual degree, to a critical and correct use of the English. With this view, written translations, carefully prepared, with due attention to differences, equivalences, and substitutions of

idioms, and the comparison and discrimination of synonyms, form a part of the entire course.

The study of Latin and Greek composition is continued through the first year, and, to some extent, through the course. Essays, historical and critical, are required from time to time, in connection with the works read, and a free use of the library is urged. It is intended that each student who completes the course in ancient languages shall have a clear knowledge of the history of Greek and Latin literature, and of the principal authors in both languages. As an aid to the appreciation of the literature of the two peoples, Greek and Roman history form an important part of the course, and are taken up in the beginning, illustrating the works read. In the first term of the third year ancient history is taken up as a separate study, and especial attention is then given to the history of Greece and Rome, and the nations with whom they come in contact. Classes will be formed for students who wish to carry their classical study further than the prescribed course, and every assistance will be given them.

The first purpose of the instruction in a classical language, like the Greek, is to cultivate a suitable knowledge of the language. In order to do this due attention is paid to essential principles of formal grammar, relegating unessential to their proper position. Much stress is laid upon the fact that the laws of syntax are the laws of mental operation, and constitute a logical and psychological study of the first importance. The value of this thought in facilitating easy translation, is very great. As an accommodation of the uttered form of speech to the demands of a versatile people, the Greek, both in etymology and in syntax, furnishes an example of great pedagogical importance. Every effort is used to present these two phases of the study in the most rational way. Properly carried out, this greatly relieves the usual difficult and tedious routine of linguistic study.

A second purpose is to employ the literature read as a basis for the consideration of those numerous problems of life and civilization which the Greeks attempted to solve. The debt of present civilization to the Greek movement is so large and so varied that abundant opportunity is afforded for a fruitful study of the growth and descent of institutions and ideas. To effect this purpose conversations and lectures upon the governmental, moral, educational, and aesthetic ideas are used, and special studies prescribed. The University library is supplied with ample authorities for this purpose.

The two aims meet, therefore, in a common ground of living advantage to the student, as the study is of a rich language that has never ceased to be spoken, and of men whose accomplishments intimately affect all phases of modern progress.

COURSE IN ANCIENT LANGUAGES,

Leading to Degree of B.A.

FIRST YEAR.

1. Cicero de Amicitia; Hellenica; Advanced Algebra; Drawing.
2. Livy; Odyssey; Trigonometry; Drawing.
3. Horace, Odes; Memorabilia; Conic Sections; Drawing,

SECOND YEAR.

1. Horace, Satires; Demosthenes; Physics; French (optional).
2. Terence; Plato; Physics; French (optional).
3. Tacitus; Homer; Physics; French (optional).

THIRD YEAR.

1. History, Ancient; Chemistry; Physiology.
2. History, Mediæval; Quintilian; Zoölogy.
3. History, Modern; de Officiis; Geology or Astronomy.

FOURTH YEAR.

1. History of Civilization; Mental Science; Early English or Geology.
2. History, Constitutional; Logic; Middle English or Pedagogy.
3. Political Economy; Civics or History of Philosophy; Philology or Pedagogy.

PHILOSOPHY AND PEDAGOGY.

The studies of this course may follow the first two years of either of the other courses in the College of Literature and Science. It is designed especially for those who intend to enter the profession of teaching. It includes ten terms of technical work distributed during the two years. The instruction is intended to ground the student in the philosophy of teaching and training pupils, and of the management of schools.

Educational Psychology. Its chief purpose is the awakening of the pedagogical consciousness. Some of its topics are: The production of sense perceptions; clear and obscure consciousness; laws for the reciprocal action of ideas; reproduction and memory; the imagination and its significance for instruction and moral training; apperception and its supreme importance in education; attention; the fate of concepts; thinking; the judgment, the syllogism; formation and kinds of notions; fancy; the eye as concept of the body, as meeting-place of concepts; the historical eye; "we" as social eye; feelings, their content, tone, strength, and duration; relation of feelings to concepts; kind of feeling; desire, and its relations to thought and feeling; classification of desires; will and

its rise and development; freedom in mental states; reflection and self-determination; psychological freedom; reason; character.

Science of Instruction. Purposes of instruction. Interest, direct, permanent and many sided, the fundamental condition of all sound instruction. The selection, arrangement, and co-ordination of the matter of instruction; general methods of instruction, as in the apperception of individual notions, the nature and significance of generalizations in instruction (pedagogical significance of inductive methods); the fixing and utilizing of knowledge through concrete application; practical applications of the foregoing through model exercises prepared by the students.

Logic. This study lies at the basis of the natural or logical organization of the studies of the curriculum. Any given topic in arithmetic, for example, is logically preceded and followed by others. Logic also gives a key to the deeper or philosophical discussion of the problems of mind. Some of its topics are as follows:

Principles of logic; conditions of valid thinking; forms of arguments; fallacies and their classification; inductive and deductive reasoning; principles and methods of investigation; practical applications of logic in the construction of arguments, in the detection and answer of fallacies, and the formation of the habits of thinking and common judgment of life.

Special Methods. This work includes a full pedagogical treatment of each of the common branches, as reading, language, arithmetic, grammar, history, drawing, etc. It seeks to answer such questions as the following: What are the essential or governing ideas in this subject? What is the natural order of their development? What phases of this natural or logical development correspond to the various phases in the development of the child; or, what would an ideal course of study show in each grade, so far as the subject is concerned? How must the general laws of instruction be applied to this special subject? What is the history of this study in school education, as to its introduction and development, as to the development of methods of teaching it? What is the specific educational value of this subject in the discipline of mind and in practical usefulness? What is its relation to the other subjects of the curriculum?

Mental Science. This study embraces largely the topics found in educational psychology, but is treated in a broader, less technical manner. Its bearing on ethics, aesthetics, and the formation of moral character is emphasized. It serves also as an important part of the preparation for the higher philosophical study.

School Supervision. Historical view of school supervision in the United States; character of school supervision; state, county and city

supervision; the city superintendent of schools, his relation to pupils, to teachers; gradation and course of study; promotions; relation of superintendent to parents, to physical and moral training of pupils, to government and discipline; his relation to the board of education, to agencies for the improvement of teachers.

History of Education. The history of education traces the growth of educational ideals, showing how these are determined by national institutions and modes of thought, and also how these ideals in turn help to shape the further development of national life. Special attention is given to the growth of modern pedagogical doctrines, notably those of Comenius, Rousseau, Pestalozzi, Herbart and Froebel on the continent, and those of Locke, Bain, and Spencer in England. The central and determining principle of each educational movement or system is sought and carried to its logical conclusion. These principles are then articulated and exhibited in their organic development. The history of education is thus no longer a chaos of unrelated or repeated facts, but an organic whole, capable of being understood and remembered. In addition to this organic general view, each of the important notions of education, such as the principles of right methods, is traced in its development and transformations through the modern systems of education.

Philosophy of Education.—The basis of this work will be Bain's "Education as a Science," and Rosenkranz's "Philosophy of Education."

Introduction to Philosophy.—Nature and problems of philosophy. Relation of philosophy to the particular sciences. Presuppositions of experience; space, time, ideas of cause, effect, self-cause or self-activity; dependent and independent beings; dogmatism, scepticism, and criticism; theory of knowledge; philosophy of nature and of mind, ethics; aesthetics; tendencies and schools in philosophy.

History of Philosophy.—Rise of the spiritual view of the world, Anaxagoras, the Sophists, Socrates, Plato, Logic and Metaphysics of Aristotle, Descartes, Spinoza, Locke, Hume, Condillac, Leibnitz, Wolff, Berkeley, Kant.

COURSE IN PHILOSOPHY AND PEDAGOGY,

Leading to the Degree of B.L.

The first and second years of this course may be those of either of the other courses in the College of Literature and Science.

THIRD YEAR.

1. Educational Pyschology; Chemistry; Botany.
2. Science of Instruction; Logic; Botany.
3. Special Methods; Modern History; Astronomy or Geology.

FOURTH YEAR.

1. School Supervision; Mental Science; Physiology.
2. History of Education; Introduction to Philosophy; Zoölogy.
3. Philosophy of Education; History of Philosophy; Political Economy.

ADDITIONAL COURSES.

NOT INCLUDED IN THE FOUR COLLEGES.

COURSE IN MILITARY SCIENCE.

PROFESSOR ELBRIDGE R. HILLS,

1ST LIEUTENANT 5TH ARTILLERY, U.S.A.

By the law of congress, and of the state, the University is required to teach military tactics to its students. All able-bodied male students of the preparatory year and of college classes of the first, second, and third years are enrolled in the companies of the University battalion, and receive instruction in the following military exercises:

School of the Soldier; Manual of Arms.
School of the Company; Movements by Platoons, Firings, etc
School of the Battalion; Ployment and Deployment of close Columns.
Battalion and Company Skirmish Drill; Bugle Calls.
Bayonet Fencing; Target Practice.
Guard and Picket Duties of Sentinels.

CLASS IN MILITARY SCIENCE.

Classes are taught in military science and tactics, as far as is requisite for officers of the line. At the end of the junior year each member of the class is required to present an essay upon some military subject. This is retained in the library of the department. From these classes are selected the officers of the several companies, for which they act as instructors. The military instruction is under the charge of Lieut. Elbridge R. Hills, a graduate of the U. S. Military Academy, and an officer of the regular army of the United States. A full supply of arms and ammunition is furnished by the war department, including 300 cadet rifles and accoutrements, and two pieces of field artillery. Ammunition is furnished for practice and target firing, and for artillery use.

No student is eligible to the military class until he has reached the third term of the freshman year, nor unless he is in good standing in all his studies. The course of instruction is confined strictly to two years.

No student will be permitted to retain a command who does not maintain a good standing in conduct and scholarship.

The instruction and class exercises occupy about three hours each week, arranged, as far as possible, so as not to interfere with any other course of study. Students must be careful, however, to ascertain, before entering the military class, that the proper studies and exercises of their chosen course will not be interfered with.

Commissions.—The Governor of the state is accustomed to commission as captains, by brevet, in the state militia, such graduates of the University as have completed the studies of the military classes and have obtained the requisite experience in command in the University battalion. In order to obtain the commission the student must be approved by the Faculty and pass, satisfactorily, an examination in military science and tactics before a committee appointed by the Faculty of the University. It is expected that in order to get the required experience in command, the members of the military class of the third or junior year will serve as commissioned officers of the several companies of the battalion.

The standings obtained in military science are not counted in the number required for graduation or class standing; the commission above named being deemed sufficient reward for proficiency in this department.

University Uniform.—Under the authority of the acts of incorporation, the trustees have prescribed that all male students, after the first term of their attendance, shall wear the University uniform. The University cap is to be worn from the first. The uniform of privates consists of a suit and a cap of cadet gray cloth. Students can procure them ready made on their arrival here. The University cap is ornamented in front with the initials, U. of I., surrounded by a wreath. The uniform of commissioned officers consists of a dark blue coat and vest and trousers of lighter blue, the whole being similar to the fatigue dress of officers in the United States army. Students will always wear their uniforms on parade, but in their rooms and at recitations may wear other clothing.

The University Cornet Band is composed of students who, while members of the band, are excused from drill. Instruments and music are furnished by the University, and the band plays at drill and other college exercises.

COURSE IN MILITARY SCIENCE.

FIRST YEAR.

1. School of the Soldier and Company; Bayonet Fencing.

SECOND YEAR.

1. School of Battalion; Skirmish Drill.
2. Ceremonies and Reviews; Military Signaling; Sword Fencing.
3. Guard, Outpost, and Picket Duty; Military Signaling; Sword Fencing.

THIRD YEAR.

1. Military Administration; Reports and Returns; Theory of Fire Arms; Target Practice; Artillery Drill.
2. Organization of Armies; Art of War; Field Fortifications; Artillery Drill.

GYMNASIUM.

The military hall is furnished with a full set of gymnastic apparatus, and classes in gymnastic exercises, for both ladies and gentlemen, are organized throughout the year, under the tuition of a competent instructor. Fee, 50 cents per term.

COURSE IN ART AND DESIGN.

PROFESSOR FRANK F. FREDERICK.

This course is to subserve a two-fold purpose. 1. It affords to the students of the several colleges the opportunity to acquire such a knowledge of free-hand drawing as their chosen courses may require. 2. It offers to such as have a talent or taste for art the best facilities for pursuing studies in industrial designing or other branches of fine art. Schools of design, in Europe and in this country, have been found important aids to the higher manufactures, adding to the beauty of fabrics, and to the skill and taste of workmen.

The increased interest in the decorative arts, and in the manufactures which they require, has added new importance to the study of drawing and designing. It is the purpose to keep this school of design abreast with the best movements in this direction.

COURSE OF INSTRUCTION—ELEMENTARY CLASS.

REQUIRED WORK.

In Outline. Group of geometric solids; group of common objects; ornament from cast; detail of human figure from cast.

Light and Shade. In charcoal or French sauce: group of geometric solids; group of common objects; cast of ornament. In water-color, sepia: group of common objects; cast of ornament.

Design. An original exercise showing principles and methods; another employing color; an original practical design.

PAINTING AND MODELING CLASS.

REQUIRED WORK. FIRST YEAR.

Painting in Water Color. Flower and foliage from nature; group as a study for composition and color.

Drawings. Study of antique figure from cast; anatomical details.

Design. Details comprising the human, animal, plant, and insect form, for the purpose of design; monograph of the ancient, mediæval, and modern styles of ornament; an original practical design in color; an original practical design to be executed in the room.

Modeling. Historic ornament from cast; study of ornament from flat copy.

Casting. Casts of the two preceding: from nature of arm, hand, or foot; also from nature of foliage, fruit, or vegetable.

Perspective. Building from photograph, rendered in line; same from nature; building shaded in sepia; landscape from nature in line or water-color.

REQUIRED WORK. SECOND YEAR.

Painting in Oil. Study in monochrome from still life; group as study for composition and color.

Drawing. Study of antique figure from cast; portrait head from nature.

Modeling. Bas-relief from antique figure; anatomical rendering from antique figure; bust, life size, from the antique; portrait head from nature in round or relief.

Casting. Cast from a piece-mould, sulphur-mould, and gelatine-mould.

Design. An original practical design for the flat or round.

ADVANCED CLASS.

Every opportunity will be offered to perfect the student in his chosen branch of study.

As a preparation for entering the course in art and design, the study of plane geometry and projection drawing is recommended.

Topics for reading upon art subjects are given weekly.

Detailed studies and sketches, such as are necessary to the successful rendering of things, will be required outside of the regular exercises.

For admission to the advanced classes the student must show proficiency in preliminary work.

The authorities of the University have provided that persons not connected with the institution may join the drawing and painting classes on very moderate terms.

COURSE IN RHETORIC AND ORATORY.

All students are required to participate in the exercises of this course. Such an outline of instruction in composition and oratory is provided as makes it probable that all who complete it faithfully will be able to express their thoughts, both with voice and pen, in a clear, intelligent manner, and without affectation or embarrassment.

The required theme work extends over the first two years of the course, the remaining two being given to the art of oratory, including the principles of delivery.

The number of themes from freshmen is eight, and from sophomores twelve, and each paper, after correction, is returned to the student to be re-written. For composition the classes are divided into sections of about twenty, which meet weekly. At these meetings, questions of students are answered, the faults and merits of the essays of the preceding week are pointed out, and subjects assigned for the next week. One lecture each term is given by the professor to the whole class, on the kind of writing involved in the next twelve weeks; as narration, description, argument, etc.

In oratory, the classes are also divided into sections. A critical analysis is made of some of the master-pieces of the great orators of England and America. The life and character of the orator, the circumstances that called forth the oration, his object in pronouncing it, are considered, and a study is made of his diction, sentences, paragraphs, figures of speech, etc. In addition, selections from the oration are as-

signed to the members of the class, which, after being well committed to memory, are carefully prepared, under the supervision of the instructor, for delivery in the presence of the whole class.

Each member of the senior class is required to prepare a suitable oration or essay and to deliver it before the Faculty and students in the chapel.

MUSIC.

CLARA MAUD KIMBALL.

Music constitutes no part of any University course of studies, and is therefore not provided by the Trustees. But, as many students desire instruction in music, competent teachers are selected by the Trustees, and rooms are set apart for instruction.

TUITION.

Instruction, term of ten weeks—2 lessons a week	$10 00
For a term of ten weeks—one lesson a week	6 00
Practice on piano, one hour daily, per term	2 00

The teacher of Vocal Music and Voice Culture follows the Italian method, giving individual instruction.

TERMS.

Ten weeks—two lessons a week	$12 00
Ten weeks— one lesson a week	7 00

No deduction on account of absence in either course, except in case of protracted illness.

Special students in music will also be charged the regular term fee charged other students of the University.

PRIZES AND SCHOLARSHIPS.

THE CONKLIN ORATORICAL PRIZES.

Mr. R. R. Conklin, an alumnus of the University, has offered two prizes, of $60 and $40, respectively, for original orations from Juniors, to be pronounced at such time as the Faculty may appoint during the week of commencement. Competition is open to such as are full members of the junior class. From the orations presented on or before the first day of May preceding, a number, not to exceed ten, to be selected by the Faculty, will be presented on the platform, and to the first and second best, as may be determined by judges, the prizes will be awarded.

THE HAZLETON PRIZE MEDAL.

Capt. W. C. Hazleton has provided a medal, of beautiful and artistic design, which is to be awarded at a competitive drill to be held near the close of the year, to the best drilled student. Each competitor must have been in attendance at the University for at least sixteen weeks of the current college year; must not have had more than four unexcused absences from drill; must present himself for competition in full uniform.

The award will be made on the following points:

1. Erectness of carriage, military appearance and neatness.
2. Execution of the school of the soldier without arms.
3. Manual of arms with and without numbers.

The successful competitor will receive a certificate setting forth the facts, and may wear the medal until the 15th of May following, when it will be returned for the next competition.

THE HARRIET ABBOT-BIRCHMORE PRIZE.

This prize is offered to stimulate accurate study of the changes produced in articles of human food. The subject for which a prize is offered in 1892 is "The identification of any hitherto undetermined poison developed in human food, and the isolation of the cause." The prize offered, a set of re-agents for the micro-technique. The contestants, the pupils in the Botanical Laboratory of the University of Illinois.

THE HONORARY SCHOLARSHIPS.

Provision has been made for one honorary scholarship for each county in the state. The holder of the scholarship may attend the University for four years, under proper regulations, free of charge for tuition or incidental expenses. The total value of this scholarship is $90.

Several of these scholarships are already occupied. The vacancies in other counties will be filled as follows:

Examinations are to be held in the several counties, under the supervision of the county superintendents thereof, on the second Friday and Saturday of June, at such places as the superintendents may select. Candidates for the examination must be approved by the superintendents in the common English branches. Questions will be furnished from the University, and the answers, in writing, will be sent to the University for judgment. The scholarship will be awarded to the candidate who passes the best examination, provided he has a standing in each subject of not less than 75, and an average standing on all the subjects of not less than 80 per cent.

Each pupil who enters the examination may choose whether he will be examined to enter upon a technical course in Colleges of Agriculture, Engineering, or Natural Science, or a literary course in the College of Literature and Science.

In the first case, the subjects of his examination will be algebra, geometry, physiology, botany, natural philosophy, and English rhetoric.

In the second case, the subjects will be algebra, geometry, botany or natural philosophy, four books of Cæsar, six orations of Cicero, and six books of the Æneid.

The two classes of examinations are intended to be as nearly equivalent as possible, and to conform to the requirements stated under the head, *Examinations for Admission*, p. 79. It is essential that the examinations in the counties be held at the time named above, publicly, and with reasonable notice; requests for special or private examinations can not be considered.

PREPARATORY CLASSES.

To meet an urgent demand, the Trustees have temporarily provided for teaching the preparatory studies lying between the work of the Elementary schools and the University. Candidates for these classes must be not less than fifteen years old. They must pass satisfactory examinations in arithmetic, geography, English grammar, and history of the United States.

Students in the preparatory studies are not matriculated as members of the University. They pay no entrance fee, but are charged a tuition fee of five dollars a term, and the incidental fee of seven and a half dollars a term. They have all the privileges of the library, and of the public lectures, and are required to drill.

The studies taught in the preliminary year are as follows:

FOR COLLEGES OF AGRICULTURE, ENGINEERING, AND NATURAL SCIENCE.

First Term.—Algebra—(Wells's). Fundamental rules; factoring; common divisors and multiples; powers and roots; calculus of radicals; simple equations; proportion and progression. *Physiology.*—(Cutter's.) *Natural Philosophy.*—(Norton's.)

Second Term.—Algebra.—Quadratic equations, etc. *Geometry.*—(Wells's) Plane geometry, lines, circumferences, angles, polygons, as far as equality. *English.*—Elements of composition. (Clark's.) Orthoepy and word analysis. (Introduction to Webster's Academic Dictionary.)

Third Term.—Geometry completed, including solid geometry and the sphere. *English*, as in the second term, with addition of Goldsmith's Traveler and Deserted Village, read for analysis. *Botany.*—Gray's Lessons and Manual.

FOR COURSES IN THE COLLEGE OF LITERATURE AND SCIENCE, EXCEPT THE COURSE IN ANCIENT LANGUAGES.

First Term.—Algebra as above. *Physiology. Natural Philosophy. Latin.*—Cicero's Orations. Prose composition.

Second Term—Algebra and Geometry, as above. *Latin.*—Æneid. Prose composition.

Third Term.—Geometry, as above. *Botany. Latin.*—Æneid. Prose composition.

FOR COURSE IN ANCIENT LANGUAGES.

First Term.—Algebra, as above. *Latin.*—Cicero's orations. Prose composition. *Greek.*—Grammar and Reader.

Second Term.—Algebra and Geometry, as above given. *Latin.*—Æneid. Prose composition. *Greek.*—Anabasis. Prose composition.

Third Term.—Geometry completed. *Latin.*—Æneid. Prose composition. *Greek.*—Anabasis. Prose composition.

SOCIETIES.

The Literary Societies have from the opening of the University enjoyed its fostering care.

The ADELPHIC, PHILOMATHEAN, and ACADEMY societies, for men, and the ALETHENAI, for women, occupy spacious halls, which the members have furnished and decorated with taste and elegance. Meetings are held Friday evenings throughout term time, are well attended, and are maintained with unflagging interest. They furnish excellent drill in writing, speaking, and parliamentary methods.

The YOUNG MEN'S and YOUNG WOMEN'S CHRISTIAN ASSOCIATIONS are both active and useful.

Special organizations unite the students of NATURAL HISTORY, of CIVIL ENGINEERING, of MECHANICAL ENGINEERING, of ARCHITECTURE, of AGRICULTURE, and of CHEMISTRY, and in ATHLETICS.

REGULATIONS AND ADMINISTRATION.

ADMISSION.

Examinations of candidates for admission to the University, or to any of its departments, are held at the University itself, on the two days previous to the opening of each term.

Applicants must be at least fifteen years of age, must pass the required examinations, and must pay the prescribed fees. No distinction is made in regard to sex, nativity, color, or place of residence. Entrance may be made at any time, provided the candidate is competent to take up the work of the classes then in progress; but it is very much better to begin upon the first collegiate day in September, when a large number of the classes are organized, several of them to continue during the year. Entrance, however, may usually be made satisfactorily at the beginning of the winter and spring terms.

Entrance Examinations.—The subjects upon which examinations for admission are held are as enumerated below:

FOR THE COLLEGES OF AGRICULTURE, ENGINEERING AND NATURAL SCIENCE.

Arithmetic; English Grammar; Geography; History of the United States; Algebra, including equations of the second degree and the calculus of radical quantities; Geometry, plane and solid; Physiology; Botany; Natural Philosophy; Rhetoric and Composition.

The text books mentioned in course of study for the preparatory classes, page 77, may be taken as an indication of the requirements in these studies. Any real equivalents for the books named are accepted.

FOR COLLEGE OF LITERATURE AND SCIENCE.

For the courses in English and Science, Latin and Science, and Philosophy and Pedagogy, the same as the above, except the Rhetoric and Composition and with the addition of the following Latin:

Four books of Cæsar's Commentaries, six orations of Cicero, six books of Vergil's Æneid, with scansion of hexameter verse and the translation of English sentences into Latin prose, based on the portions of Cæsar and Cicero above named. This will necessitate a thorough knowledge of the etymology and syntax of Latin grammar.

Harkness's or Allen and Greenough's grammar and Winchell's (Bingham's) Latin Prose Composition are recommended.

Real equivalents for any of the above mentioned works will be accepted.

The Roman method of pronunciation is recommended.

For the Course in Ancient Languages, the same as the first list, except the omission of Rhetoric and Composition, Physiology, Botany, and Natural Philosophy, and with the addition of the Latin described and Greek as follows:

Greek Grammar (Goodwin's or Hadley's), Greek Prose Composition (Jones's), and four books of Xenophon's Anabasis. Writing Greek with the accents will be required.

The so-called Continental sounds of the vowels and diphthongs and pronunciation according to accent are recommended.

County Superintendents' Certificates.—To prevent loss to those who are not prepared to enter the University, but might come, hoping to pass the examinations for admission, the following arrangement has been made:

County Superintendents of schools will be furnished with questions and instructions for the examination of candidates in the four common branches, arithmetic, geography, English grammar, and history of the United States; applicants who pass creditably will, when they present the superintendent's certificate to that effect, be admitted to the classes of the preliminary year.

Persons who hold teacher's certificates from county superintendents will be admitted to the preliminary class without further examination.

Accredited High Schools.—The Faculty, after personal examination, appoints accredited high schools, whose graduates may be admitted to the University without further examination within one year after date of their graduation. These must be schools of first rate character, whose courses of instruction include all the studies required for admission to some one of the colleges of the University. On application, a member of the Faculty is sent to examine the school making application, as to its facilities for teaching, its course and methods of instruction, and the general proficiency shown. If the report is favorable, the name of the school is entered in the published list of high schools accredited by the University. The graduates of these schools are admitted to such of the colleges as their studies may have prepared them to enter. The appointment continues as long as the work of the school is found satisfactory. Annual reports are asked from these schools.

The accredited schools whose graduates are admitted to any of the colleges of the University are the public high schools in

Aurora, East.	Charleston.	Decatur.
Aurora, West.	Chicago, North.	Dixon.
Bloomington.	Chicago, South.	Evanston.
Cairo.	Chicago, West.	Freeport.
Champaign.	Danville.	Galena.

Hyde Park.	Mendota.	Rockford.
Jacksonville.	Moline.	Rock Island.
Jerseyville.	Oak Park.	Springfield.
Kewanee.	Ottawa.	Streator.
Lake View.	Paris.	Tuscola.
Lincoln.	Peoria.	Urbana.
Mattoon.	Princeton.	

Also the high school of the Normal University, at Normal.

The accredited schools whose graduates are admitted to the College of Engineering, of Agriculture, or of Natural Science are the public high schools in

Camp Point.	Peru.	Sterling.
Farmer City.	Pittsfield.	Sycamore.
Gibson City.	Polo.	Warren.
Kankakee.	Robinson.	Washington.
La Salle.	Rochelle.	Watseka.
Marengo.	Rossville.	Waverly.
Monticello.	Shelbyville.	Yorkville.
Pekin.	Sheldon.	

Also the Chicago Manual Training School.

CHOICE OF STUDIES.

From the outset, the University has permitted great freedom in the selection of studies. It is, however, necessarily required: that the student shall be thoroughly prepared to enter and to keep pace with the classes in the chosen studies, and that he shall take these studies in the terms in which they are taught. *Candidates for a degree must take the course of study prescribed for that degree.* But in the Colleges of Agriculture, Natural Science, and Literature and Science, other University drawing will be accepted for an equivalent amount of free-hand drawing.

Each student is expected to have three distinct studies, affording three class exercises each day. On special request, the Faculty may allow less or more.

No change in studies may be made after the beginning of a term without permission of the Faculty.

Due care will be taken to prevent, as far as possible, all abuse of the liberty of choice. Students failing to pass satisfactory examinations in their chosen studies will not be permitted to remain and take other studies without a vote of the Faculty.

REQUIRED STUDIES.

To secure the diffusion of the sciences relating to the great industries, the state legislature, in 1873, prescribed that each student should be taught some of those sciences.

The Trustees accordingly require that each student shall take, each term, one study, at least, from the following list:

Agricultural Chemistry.
Agricultural Engineering and Architecture.
Analytical Mechanics.
Anatomy and Physiology.
Animal Husbandry.
Architectural Drawing and Designing.
Astronomy.
Botany.
Bridges.
Chemistry.
Dynamics.
Electric Machinery.
Elements of Agriculture.
Elements of Horticulture.
Entomology.
Esthetics of Architecture.
Estimates.
Free-Hand Drawing.
Geodesy.
Geology.
Graphical Statics.
Heat Engines.
History of Agriculture.
History of Architecture.
Hydraulic Engines and Wind Wheels.
Hydraulics.
Landscape Gardening.
Logic.
Machine Drawing.
Masonry Construction.
Mathematics.
Mechanism.
Mental Science.
Metallurgy.
Military Science.
Mill Work.
Mine Administration.
Mine Attack.
Mineralogy.
Mining Engineering.
Physics.
Physiography.
Political Economy.
Railroad Engineering.
Resistance of Materials.
Rural Economy.
Sanitary Construction.
Stone, Brick and Metal Construction.
Surveying.
Vegetable Physiology.
Veterinary Science.
Wood Construction.
Zoölogy.

TERM EXAMINATIONS.

Written examinations are held at the close of each term or oftener, and whenever any study has been finally completed. Any student failing to answer correctly 75 per cent. of the questions proposed, loses all credit for that study, and is precluded from proceeding with any other studies without special permission.

A record is kept of each student's term work and standing, and from this his final certificate of graduation is made up.

A statement of the scholarship and conduct of each student will be sent to his parent or guardian as soon as may be after the end of each term.

DEGREES AND CERTIFICATES.

The law provides that, "on recommendation of the Faculty, the Trustees may authorize the Regent, as president of the University, to issue diplomas to such persons as shall have completed satisfactorily the required studies, and sustained the examination therein, conferring such literary and scientific degrees as are usually conferred by Universities for similar or equivalent courses of studies, or such as the Trustees may deem appropriate." *Approved May 11, 1877.*

In accordance with the law, the following system of degrees has been adopted by the University:

1. All studies will remain, as heretofore, free. Each student may choose and pursue such studies as he may desire, subject only to such conditions as to preparation, times of study and number of studies, as may be necessary to secure efficiency in classes and economy in teaching.

2. But students who wish to be candidates for any degree must complete fully the course of studies prescribed for such degree, and must present an accepted thesis.

3. Students not candidates for any degree will be enrolled as special students, and will receive at the close of their attendance, if not less than a year, the certificates provided by law, with statements of work done and credits attained. Credits from other institutions may not be entered upon such certificates.

The form of graduation with a "full certificate" will be discontinued after the commencement of 1891.

4. It is designed that the requirements for all the bachelor's degrees shall be, as nearly as possible, equal in amount and value.

5. The Degree of Bachelor of Science, B.S., will be given to those who complete either of the courses of study in the College of Engineering, Agriculture, or Natural Science. The name of the course will be inserted after the degree.

6. The Degree of Bachelor of Letters, B.L., will be given to those who complete the course of English and Science, Latin and Science, or of Philosophy and Pedagogy.

7. The Degree of Bachelor of Arts, B.A., will be given to those who complete the course in Ancient Languages.

8. The Master's Degrees, M.S., M.L., and M.A., and the equivalent degrees of C.E., M.E., etc., will be given to those only who have

pursued a year of prescribed post-graduate studies, and passed examinations thereon, or after a term of three years' successful practice. In either case an accepted thesis will be required.

GENERAL DIRECTIONS TO STUDENTS.

Young men or women desiring a liberal education, and living at a distance from a college or university, are often puzzled to understand precisely what they will be required to know and to do in order to gain admission. To such these words are addressed:

1. Notice that a college or university (which is properly a collection of colleges) is designed for the higher education only, and not for the study of common branches. None of the common branches, such as arithmetic, geography, English grammar, reading and spelling, are taught in this University. These all must be finished before you come.

2. In order to pursue profitably the true college studies, and to keep pace with the classes, you must be ready to pass a strict examination in the common branches just mentioned, and in certain other preparatory studies, differing with the different colleges of the University. (See p. 79.)

3. If well prepared only in the common branches above named, you may be admitted, not to the college, but to the preparatory classes, in which you will study the other preparatory studies for admission to college. (See p. 77.) All preparatory studies must be completed before you can be admitted, as a matriculated student, to any college class.

4. All college studies are arranged in regular courses, in which each term's work is designed to prepare for the next. You should enter at the beginning of the college year, in September. If unable to enter at that time, you may enter at any later time by making up the studies already passed over by the class.

5. Enter college with the purpose of going through, and make your course *regular as far as you go*. If obliged to leave before you have finished the course, you will have done the best thing for yourself in the meantime; while if you remain, the regular course is in nine cases out of ten the most useful and effective.

Students desiring only a winter's schooling should go to some high school.

LABOR.

Labor is furnished as far as possible to all who desire. It is classified into educational and remunerative labor.

Educational labor is designed as practical instruction, and constitutes

a part of the course in several schools. Students are credited with their proficiency in it as in other studies. Nothing is paid for it.

Remunerative labor is prosecuted for its products, and students are paid what their work is worth. The usual rate paid for ordinary farm, garden, and shop labor is *ten cents* per hour. Students of sufficient experience may be allowed to work by the piece or job, and thus by diligence or skill secure more pay.

Some students who have the requisite *skill, industry, and economy*, pay their entire expenses by their labor; but, in general, young men cannot count upon doing this at first, without a capital to begin with, either of skill or of money, to serve them till a degree of skill is acquired. As the number of students increases, it is found more and more difficult to furnish the labor needed, and students cannot count upon finding employment.

BOARD.

The University does not furnish board. There is no general provision for boarding, but there is an abundance of suitable private places in Urbana and Champaign within a reasonable distance of the University, and easily accessible by electric railways, where students can obtain either table board or board and rooms, with the advantages of the family circle. Boarding clubs are formed, at which the cost of meals is about two and a half dollars per week. Some students prepare their own meals, thus considerably reducing expenses.

The Business Agent and the Young Men's and Young Women's Christian Associations of the University will aid new students in procuring rooms and boarding places.

EXPENSES.

THE TUITION IS FREE in all the University classes.

THE MATRICULATION FEE entitles the student to membership in the University until he completes his studies, and must be paid before he enters.

Amount.....$10.00

THE TERM FEE for incidental expenses is for each student..... 7.50

Each student working in laboratories, or in the draughting or engineering classes, is required to make a deposit varying from 50 cents to $10, to pay for chemicals and apparatus used, and for any breakages or damages.

ALL BILLS due the University *must be paid before the student can enter classes.*

The following are estimated maximum and minimum annual expenses, exclusive of books and clothing, of a residence of thirty-six weeks at the University:

	MIN.	MAX.
Term fees	$ 22.50	$ 22.50
Room rent for each student	18 00	48.00
Table board in boarding houses and clubs	90 00	126.00
Fuel and light	10 00	15.00
Washing at 60 cents per dozen	9.00	18.00
Total amount	$149.50	$229 50
Board and room in private houses, per week	4.00	6.00

FEES IN THE PRELIMINARY YEAR, OR IN THE BUILDERS' COURSE, OR THE FARMERS'-JUNIOR COURSE.

Tuition per term	$5.00
Incidental fee, per term	7.50

SPECIAL FEES.

For Instrumental Music, for 20 lessons	$10.00
For Painting, or Drawing to special students	10 00
Matriculation fee	10.00
Graduation fee	5 00

CAUTION TO PARENTS—STUDENTS' FUNDS.

The Business Agent will receive on deposit any funds parents may intrust to him to meet the expenses of their sons. *No greater error can be committed than to send boys from home with large amounts of spending money,* without the authoritative care of some prudent friend. Half the dissipation in colleges springs from excessive allowances of money. Students have little real need for money, beyond that required for fees, board bills and books. The attention of parents and guardians is earnestly requested to this matter, and especially in the case of those students who are under 20 years of age.

LIST OF STUDENTS.

RESIDENT GRADUATES.

Clark, Edith Louisa,	Urbana.
Shamel, Charles H., B.S.,	Willey.
Detmer, Frederika, B.S., (Univ. of Ohio.)	Columbus, Ohio.

SENIOR CLASS.

Barclay, Thomas,	*Plainfield*,	Chemistry.
Bouton, Charles Sherman,	*Hyde Park*,	Chemistry.
Boyd, Willard Albion,	*Lewistown*,	Mechanical Engineering.
Braucher, Ernest Newton,	*Lincoln*,	Architecture.
Bunton, Fred Lyle,	*Kewanee*,	Mechanical Engineering.
Chester, Dick Hubert,	*Champaign*,	Chemistry.
Chester, John Needels,	*Champaign*,	Civil Engineering.
Clarke, Edwin Besançon,	*Quincy*,	Architecture and Mil.
Clarke, Frederic Woodruff,	*Quincy*,	Architecture and Mil.
Eidmann, Edward Charles,	*Mascoutah*,	Civil Engineering.
Eno, Frank Harvey,	*Pomona, Cal.*,	Civil Eng. and Mil.
Fischer, Lawrence,	*Oregon*,	Architecture.
Frahm, Hans,	*Tuscola*,	Eng. and Mod. Lang.
Frederickson, John Henry,	*Champaign*,	Civil Engineering.
French, Ransford Morton,	*Pana*,	Architecture.
Gardner, Frank Duane,	*Gilman*,	Agriculture.
Gibson, Charles,	*South Grove*,	Civil Engineering.
Green, Thomas Stephen,	*Jacksonville*,	Natural History.
Harris, Jay Tarven,	*Champaign*,	Civil Engineering.
Harvey, Alfred Ernest,	*Paris*,	Civil Eng. and Mil.
Hay, Walter Morris,	*Sandwich*,	Civil Engineering.
Hobbs, Glen Moody,	*Yorkville*,	Eng. and Mod. Lang.
Howorth, Thomas James,	*Chester*,	Ancient Languages.
McClure, Ora Deal,	*Gibson City*,	Mech. Eng. and Mil.
McCormick, Wirt,	*Mahomet*,	Eng. and Mod. Lang.
Maue, August,	*Mokena*,	Eng. and Mod. Lang.
Mitchell, Charles Jacob,	*Fulton*,	Civil Engineering.
Peabody, Lorin William,	*Urbana*,	Mechanical Engineering.
Powell, John Henderson,	*Shawneetown*,	Civil Engineering.

Richart, Frederic William,	*Fredonia*,	Mechanical Engineering.
Shamel, Clarence Albert,	*Willey*,	Agriculture.
Shattuck, Walter Francis,	*Champaign*,	Architecture.
Smolt, Franklin Oscar,	*Paw Paw*,	Chemistry and Mil.
Terrill, Joseph Samuel,	*Urbana*,	Natural History.
Vail, Charles Davis,	*Lone Tree*,	Civil Eng. and Mil.
Wallace, Ross Strawn,	*Pontiac*,	Mech. Eng. and Mil.
Young, Charles B.,	*Aurora*,	Architecture.
Beach, Laura Mae,	*Champaign*,	Natural History.
Broaddus, Alice Virginia,	*Urbana*,	Natural History.
Butterfield, Helen Eliza,	*Champaign*,	Eng. and Mod. Lang.
Carson, Annie,	*Urbana*,	Eng. and Mod. Lang.
Darby, Nellie Margaret,	*Urbana*,	Eng. and Mod. Lang.
Heller, Opal Beatrice,	*Urbana*,	Eng. and Mod. Lang.
Jones, Isabel Eliza,	*Champaign*,	Natural History.
Jones, Mabel,	*Champaign*,	Eng. and Mod. Lang.
Myers, Clara,	*Newport, Ind.*,	Eng. and Mod. Lang.
Paine, Sarah Mariena,	*Orizaba*,	Natural History.
Shattuck, Anna Fletcher,	*Champaign*,	Eng. and Mod. Lang.
Seibert, Emma Effie,	*Champaign*,	Natural History.

JUNIOR CLASS.

*Baker, John Phœnix,	*Parkersburg, Iowa*,	Civ. Engineering.
Barker, John King,	*Three Rivers, Mass.*,	C. E. and Mil.
Burrows, Parke Tunis,	*Davenport, Iowa*,	Arch. and Mil.
Carnahan, Franklin Gregory,	*Champaign*,	Ancient Languages.
Crissey, John Waterbury,	*Chester*,	Civil Engineering.
Cross, Charles William,	*Kewanee*,	Architecture.
Forbes, Robert H.	*Princeton*,	Chemistry.
Foster, Winslow Howard,	*Chicago*,	Mechanical Engineering.
Foster, Zebulon,	*Armstrong*,	Civil Engineering.
Funston, Edmund B.,	*Champaign*,	Architecture.
Gates, Andrew Wallace,	*Earlville*,	Civil Engineering.
*Gulick, Edward Everett,	*Champaign*,	Eng. and Mod. Lang.
Gulick, Joseph Piper,	*Champaign*,	Eng. and Mod. Lang.
Gunn, Charles Alexander,	*South Evanston*,	Architecture.
*Hall, Fred Augustus,	*Tonica*,	Chemistry.
Hallinen, Joseph Edward,	*Champaign*,	Natural History.
Harris, William Henry,	*Seymour*,	Civil Engineering.

NOTE.—A star (*) indicates that a student has not secured the full number of credits belonging to the class in which he is enrolled. He may have fallen behind this class, or he may have advanced beyond the class below.

Hart, Ralph Warner,	*Chicago*,	Architecture.
Harvey, Walter Clarence;	*Paris*,	Architecture.
Herrick, Lott Russell,	*Farmer City*,	Eng. and Mod. Lang.
*Hubbell, James Pease,	*Davenport, Iowa*,	Arch. and Mil.
Kiler, Charles A.,	*Urbana*,	Natural History.
Klingelhoefer, William,	*Mascoutah*,	Civil Engineering.
*McCartney, William Priestly,	*Metropolis*,	Chemistry.
McLane, Cyrus D.,	*Allerton, Iowa*,	Architecture.
Martin, William Alexander,	*Chicago*,	Mechanical Engineering.
Mather, Roy Allen,	*Naperville*,	Civil Eng. and Mil.
Miller, William George,	*Chicago*,	Mech. Eng. and Mil.
Morgan, John Barb, Jr.,	*Kinmundy*,	Eng. and Mod. Lang.
Mosier, Jeremiah George,	*Urbana*,	Natural History.
*Morse, Burt,	*Farmington*,	Architecture.
*Nelson, Elnathan Kemper,	*Paris*,	Chemistry.
*Page, John William,	*Waukegan*,	Civil Engineering.
Parkman, Charles Chester,	*Philo*,	Architecture.
*Pasfield, George L.,	*Springfield*,	Eng. and Mod. Lang.
Phillips, James David,	*Englewood*,	Architecture.
Pillsbury, Arthur Low,	*Urbana*,	Civil Eng. and Mil.
Plank, Ulysses Samuel Grant,	*East Lynne, Mo.*,	Natural History.
Pullen, Rome B.,	*Centralia*,	Eng. and Mod. Lang.
Sandford, William Emanuel,	*Kewanee*,	Chemistry.
Scheidenhelm, Edward Lewis,	*Mendota*,	Civil Eng. and Mil.
Siebernes, John Reuben,	*Peoria*,	Civil Engineering.
Snodgrass, William, Jr.,	*Urbana*,	Mechanical Engineering.
Spencer, James Elihu,	*Champaign*,	Civil Engineering.
Steele, James,	*Henry*,	Chemistry and Mil.
Wait, Benjamin Asaph, Jr.,	*Armstrong*,	Civil Engineering.
Williamson, Frank Robert,	*St. Anne*,	Civil Engineering.
*Wood, Robert Alvin,	*Woodburn*,	Mechanical Engineering.
Wright, Royal	*Urbana*,	Eng. and Mod. Lang.
Barber, Alice May,	*LaFox*,	Natural History.
Bennett, Sarah,	*Mattoon*,	Eng. and Mod. Lang.
Boggs, Cassie,	*Urbana*,	Eng. and Mod. Lang.
Hill, Agnes Gale,	*Nevada, Mo.*,	Ancient Languages.
Maxwell, Annele Melissa;	*Champaign*,	Eng. and Mod. Lang.
*Pearman, Myrtle,	*Champaign*,	Natural History.
*Philbrick, Margaret,	*Champaign*,	Natural History.

SOPHOMORE CLASS.

Andrews, Herbert Franklin,	*Piasa*,	Natural History.
Aranda, Ezequiel,	*Allende, Mex.*,	Mechanical Eng.
Bacon, Harlow,	*Huntsville*,	Civil Eng. and Mil.
Bainum, Curtis S ,	*Champaign*,	Architecture.
Barber, William Davis,	*Champaign*,	Civil Engineering.
Bartlett, Henry Emmett,	*Mt. Sterling*,	Civil Engineering.
Behrensmeyer, George Philip,	*Quincy*,	Architecture.
Beuthien, Arnold,	*Durant, Iowa*,	Mechanical Eng.
Bevis, Albon,	*Virginia*,	Architecture.
Blaine, Walter Charles,	*Champaign*,	Chemistry.
Blakesley, George Webster,	*Rock Island*,	Mechanical Eng.
Brown, Frank,	*Monticello*,	Natural History.
Brown, Frank Manear,	*Champaign*,	Architecture.
Brownell, Charles D.,	*Champaign*,	Chemistry and Mil.
Butler, William Tennent,	*Franklin, Ohio*,	Civil Engineering.
Carr, Robert Franklin, Jr.,	*Argenta*,	Chemistry.
Carrick, William,	*Newton*,	Chemistry.
Carter, Charles Willard,	*Aledo*,	Eng. and M. L. and M.
Chambers, William Rock,	*Sadorus*,	Eng. and Mod. Lang.
Coffeen, Fred Goldsmith,	*Champaign*,	Chemistry.
Coffman, Birch David,	*Champaign*,	Natural History.
Cook, James W.,	*Rock Island*,	Mechanical Eng.
Cornell, William Henry,	*Grant Park*,	Mech. Eng. and Mil.
Craig, Edward Chilton,	*Mattoon*,	Eng. and M. L. and Mil.
Crowell, S. Wentworth,	*Dragon*,	English and Mod. Lang.
Danly, Willis Wilson,	*Hennepin*,	Civil Engineering.
Davis, Jonathan Sydney,	*Atwater*,	Architecture and Mil.
Dunaway, W. Alfred,	*Ottawa*,	Architecture.
Earl, Mark Alden,	*Centralia*,	Civil Eng. and Mil.
Gibbs, William David,	*Winchester*,	Agriculture.
Graham, Louis Thomas,	*Pittsfield*,	Natural History.
Graham, William J.	*Aledo*,	Eng. and M. L. and Mil.
Gulick, Frank,	*Champaign*,	Natural History.
Hall, Lyman,	*Savoy*,	Chemistry.
Hewett, Herbert Edmund,	*Morgan Park*,	Architecture.
Hicks, Preston T.,	*Warren*,	Civil Engineering.
Higgins, Albert Grant,	*Elmwood*,	Architecture.
*Hopkins, Frank Coffeen,	*Buffalo, Wyo.*,	Mechanical Eng.
Hucke, Philip Matthias,	*Mascoutah*,	Natural History.

Huff, George A., Jr.	*Englewood*,	Chemistry.
Hunt, Edward Everett,	*Urbana*,	Chemistry.
Kellogg, Edwin Frederic,	*Champaign*,	Mechanical Eng.
*Kenaga, William Christopher,	*Kankakee*,	Eng. and Mod. Lang.
Kerns, Shirley Kendrick,	*Champaign*,	Chemistry.
Kinkead, James Albert,	*Earlville*,	Chemistry.
Levy, Alexander	*Brookfield, Mo.*,	Architecture.
Locke, Alfred,	*La Salle*,	Mech. Eng. and Mil.
Lockwood, Frank Miner,	*Champaign*,	Architecture.
Loomis, Arthur Bates,	*Fulton*,	Civil Engineering.
McClure, Clyde Benjamin,	*Gibson City*,	Civil Engineering.
McGee, Walter Scott,	*Deers*,	Natural History.
McMains, Louis,	*Armstrong*,	Natural History.
*Mann, Jacob Grant,	*Mascoutah*,	Civil Engineering.
Merrifield, Albert Warren,	*Ottawa*,	Civil Engineering.
Metcalf, James David,	*Girard*,	Chemistry.
Millar, Clendon Van Meter,	*Mattoon*,	Chemistry.
Morehouse, Merritt J.,	*Mt. Pleasant, Ia.*,	Architecture.
Needham, James,	*Collinsville*,	Mining Engineering.
Northam, George Abiah,	*Nora*,	Architecture.
Outcalt, Irvin Erastus,	*Champaign*,	Eng. and Mod. Lang.
Paul, William Lewis,	*Peoria*,	Architecture.
Peterson, Adolph B.,	*Chicago*,	Architecture.
Pierce, Charles Ingals,	*Pittsburgh, Pa.*,	Mechanical Eng.
Powers, Will Ambrose,	*Belvidere*,	Chemistry.
Quinn, Edward John,	*La Salle*,	Chemistry.
Rea, Alfred Willemin,	*Urbana*,	Architecture and Mil.
Rowe, William Briggs,	*Ottawa*,	Ancient Languages.
Scott, Donald Gamaliel,	*Champaign*,	Architecture.
Seaman, George Washington,	*Beardstown*,	Mechanical Eng.
Shamel, John Young,	*Willey*,	Agriculture.
Sharpe, Richard W.,	*Tiskilwa*,	Natural History.
Shiga, Shigetsura,	*Tokio, Japan*,	Architecture.
Skielvig, Severin Canute,	*Chicago*,	Architecture.
*Smith, Riley Ellis,	*Blue Mound*,	Mechanical Eng.
Smith, Sherman,	*Leroy*,	Architecture.
Somers, Bert Sheldon,	*San Diego, Cal.*,	Architecture.
Spalding, Fred Milton,	*Gibson City*,	Civil Eng. and Mil.
Steinwedell, William Ernest,	*Quincy*,	Mechanical Engineering.
Stewart, John Truesdale,	*Onarga*,	Civil Eng. and Mil.
Swenson, Bernard Victor,	*Chicago*,	Mechanical Engineering.

*Tackett, William C.,	*Sadorus*,	Natural History.
Thielbar, Frederick John,	*Peoria*,	Architecture.
Thompson, Almon Daniel,	*Gilman*,	Civil Engineering.
Toerring, Christian Jensen,	*Davenport, Iowa*,	Mechanical Eng.
Vial, Robert Clarke,	*Western Springs*,	Civil Engineering.
Walker, Edward Lewis,	*Petersburg*,	Eng. and Mod. Lang.
Wilkinson, Charles E.,	*Argenta*,	Agriculture.
Woodruff, Thomas Tyson,	*Quincy*,	Mechanical Engineering.
Woodworth, Howard Oakley,	*Champaign*,	Natural History.
Young, Orres Ephraim,	*Stonington*,	Eng. and Mod. Lang.

Ayers, Grace,	*Urbana*,	Eng. and Mod. Lang.
Dickinson, Grace Gordon,	*Eureka*,	Eng. and Mod. Lang.
*Gilman, Sadie Goding,	*Warrensburg*,	Eng. and Mod. Lang.
Johnson, Harriette Augusta,	*Rock Island*,	Eng. and Mod. Lang.
Lamkin, Nina Belle,	*Champaign*,	Eng. and Mod. Lang.
*McCormick, Flora,	*Mahomet*,	Eng. and Mod. Lang.
Mann, Estelle,	*Geneva*,	Eng. and Mod. Lang.
*Mathews, Loueva May,	*Urbana*,	Eng. and Mod. Lang.
Peterson, Sophia Mary,	*Champaign*,	Eng. and Mod. Lang.
Yeomans, Frances Anna,	*Danville*,	Eng. and Mod. Lang.

FRESHMAN CLASS.

Arms, Franklin David,	*Chicago*,	Architecture.
Armstrong, James William,	*Toulon*,	Mechanical Engineering.
Armstrong, John Adams,	*Kewanee*,	Mechanical Engineering.
Arnold, Benjamin A.,	*Haldane*,	Natural History.
Atherton, George Henry,	*Streator*,	Civil Engineering.
Atwood, Levi Patten,	*Rockford*,	Civil Engineering.
Babcock, Clyde Leslie,	*Harvard, Neb.*,	Civil Engineering.
Bardill, John Oscar,	*Grantfork*,	Architecture.
Barker, Louis Gilbert,	*Three Rivers, Mass.*,	Mechan. Eng.
Barker, Louis William,	*Sparta*,	Civil Engineering.
Barrett, Edward Ernest,	*Port Byron*,	Civil Engineering.
Bassett, John Benjamin,	*Kewanee*,	Architecture.
Bauer, Otto Frederick,	*Bunker Hill*,	Civil Engineering.
Bauman, Otto,	*Quincy*,	Mechanical Engineering.
Beasley, Harrison Eaton,	*Peoria*,	Civil Engineering.
Benson, Oliver Newkirk,	*Champaign*,	Architecture.

Bing, Edward W.,	*Urbana,*	Chemistry.
Bowen, Herbert L.,	*Kewanee,*	Civil Engineering.
Browning, Howard Allen,	*Elgin,*	Architecture.
Burnham, Robert Davison,	*Champaign,*	Chemistry.
Burt, Henry Jackson,	*Urbana,*	Civil Engineering.
Bush, Arthur Willis,	*Joliet,*	Architecture.
Butterfield, Clarence James,	*Chicago,*	Architecture.
Carpenter, Harvey Irving,	*Champaign,*	Eng. and Mod. Lang.
Chester, Charles Ellsworth,	*Champaign,*	Civil Engineering.
Chester, Oscar Paul,	*Champaign,*	Natural History.
Chipman, Paul,	*Mt. Carmel,*	Civil Engineering.
Clark, Amos Cable,	*Urbana,*	Architecture.
Clark, Cyril Balfour,	*Champaign,*	Mechanical Eng.
Clement, Clarence Adelbert,	*Tiskilwa,*	Civil Engineering.
Cole, Edward Smith,	*Chicago,*	Mechanical Eng.
Cone, George Carroll,	*Farmington,*	Eng. and Mod. Lang.
Crawford, Charles Francis,	*Chicago,*	Civil Engineering.
Crawford, John,	*Jonesboro,*	Mechanical Eng.
Crawford, Thomas,	*Sterling,*	Mechanical Eng.
Danforth, Herman Wenger,	*Washington,*	Civil Engineering.
Dewey, George French,	*Cairo,*	Civil Engineering.
Dickinson, Richard Joy,	*Eureka,*	Civil Engineering.
Eakle, Silas Jackson,	*Forreston,*	Natural History.
Earl, Edward Curtis,	*Centralia,*	Architecture.
Elder, Charles Abbott,	*Topeka, Kas.,*	Architecture.
Engberg, Martin Jonas,	*Chicago,*	Chemistry.
Foote, Ferdinand John,	*McComb City, Miss.,*	Mechan. Eng.
Foster, Alfred Bradford,	*Bradford,*	Civil Engineering.
Fowler, Forrest Stephen,	*Buda,*	Mechanical Engineering.
Fraser, Wilber John,	*Plainfield,*	Architecture.
Frederickson, George,	*Champaign,*	Eng. and Mod. Lang.
Funston, Jesse Grant,	*Champaign,*	Mechanical Eng.
Furber, Willard Allard,	*Carlinville,*	Eng. and Mod. Lang.
Gaut, Robert Eugene,	*Mt. Sterling,*	Civil Engineering.
Greene, Fred William,	*Fayetteville, Ark.,*	Architecture.
Greene, Herbert Miller,	*Peoria,*	Architecture.
Goldschmidt, Otto Emil,	*Davenport, Iowa,*	Mechanical Eng.
Gumbiner, Charles,	*Peoria,*	Civil Engineering.
Hall, Emery Stanford,	*East Lynn,*	Architecture.
Harris, Newton Megrue,	*Champaign,*	Eng. and Mod. Lang.
Hayes, Arthur Howard,	*Litchfield,*	Mechanical Engineering.

Heideman, George Herman,	*Elmhurst*,	Mechanical Engineering.
Hiles, Elmer K.,	*Chicago*,	Mechanical Engineering.
Holbrook, Fred Samuel,	*Englewood*,	Chemistry.
Holmes, Thomas Robert,	*Streator*,	Civil Engineering.
Holston, Benjamin Baldwin,	*Nashville*,	Natural History.
Jansen, Dietrich Herman,	*Pekin*,	Civil Engineering.
Jasper, Thomas,	*Quincy*,	Mechanical Engineering.
Johannsen, Albert Henry,	*State Center, Iowa*,	Architecture.
Johannsen, Oskar August,	*State Center, Iowa*,	Architecture.
Johnson, John Cummins,	*Lacon*,	Mechanical Engineering.
Johnston, Elmer Alward,	*Dewey*,	Mechanical Engineering.
Johnston, Herbert,	*Champaign*,	Natural History.
Johnston, John Stuart,	*Sparta*,	Civil Engineering.
Kennard, Warren George,	*Champaign*,	Chemistry.
Kennedy, John William,	*Collinsville*,	Architecture.
Kerchner, Fred William,	*Belleville*,	Mining Engineering.
Kimball, William Haven,	*Chicago*,	Mechanical Engineering.
Kingman, Louis Shelby,	*Peoria*,	Mechanical Engineering.
Klingel, Louis J.	*Mascoutah*,	Eng. and Mod. Lang.
Klingelhoefer, Charles Benjamin,	*Mascoutah*,	Civil Engineering.
Kramm, Harry,	*Peoria*,	Mechanical Engineering.
Lackey, Henry William,	*Gilman*,	Architecture.
Lambert, John David,	*Quincy*,	Mechanical Engineering.
Leeds, Harmon Gibson,	*Mt. Carmel*,	Mechanical Eng.
Levy, Frank H.	*Urbana*,	Chemistry.
Lischer, Charles,	*Mascoutah*,	Natural History.
Lowry, James Percival,	*Gibson City*,	Architecture.
Lowry, John Albert,	*Gibson City*,	Civil Engineering.
McCaskrin, George Washington,	*Rantoul*,	Chemistry.
McCaskrin, Harry Madison,	*Rantoul*,	Chemistry.
McCloy, Robert Emmet,	*Welton*,	Eng. and Mod. Lang.
McCord, William Hamilton,	*Farmer City*,	Civil Engineering.
Merrick, Harry Austin,	*Chicago*,	Architecture.
Miltimore, Guy,	*Mitchell, S. Dak.*,	Civil Eng.
Morris, Edgar William,	*Onarga*,	Eng. and Mod. Lang.
Morrissey, Daniel C.	*Champaign*,	Eng. and Mod. Lang.
Neal, John Dodge,	*Rantoul*,	Chemistry.
Needham, Frank Mix,	*Hinsdale*,	Mechanical Engineering.
Orr, Edward Ellsworth,	*Quincy*,	Architecture.
Phelps, Albert Charles,	*Lockport*,	Architecture.
Riley, Walter Busey,	*Champaign*,	Eng. and Mod. Lang.

Royer, Joseph William,	*Urbana*,	Architecture.
Roysden, William Ira,	*Champaign*,	Chemistry.
Russell, Charles W.,	*Virginia*,	Ancient Languages.
†Russell, Winfred,	*Champaign*,	Natural History.
Rutledge, John Joseph,	*Alton*,	Mining Engineering.
Scott, William John,	*Champaign*,	Architecture.
Seastone, Charles Victor,	*New Boston*,	Civil Engineering.
Slater, William Frederick,	*Urbana*,	Mechanical Engineering.
Smith, Harry Keys,	*Quincy*,	Mechanical Engineering.
Snider, Harry Holderman,	*Rantoul*,	Mechanical Engineering.
Sperling, Godfrey,	*Dewey*,	Civil Engineering.
Stocker, Edwin Warren,	*Rock Island*,	Architecture.
Stone, Frank Lemuel,	*Port Byron*,	Civil Engineering.
Stowell, Hanson Abbott,	*Anona, Fla.*,	Engineering.
Strauss, William,	*Pittsfield*,	Chemistry.
Strehlow, Oscar Emil,	*Champaign*,	Civil Engineering.
Strout, Frank Asbury,	*Elwood*,	Mechanical Engineering.
Suppiger, Albert Eugene,	*Edwardsville*,	Chemistry.
Swigert, Arthur Woodward,	*Springfield*,	Architecture.
Sy, Albert Philip,	*Altamont*,	Chemistry.
Sylvester, Edmund Lewis,	*Aurora*,	Civil Engineering.
Taft, Frank Harvey,	*Champaign*,	Mechanical Eng.
Tarble, Myron J.,	*Aurora*,	Civil Engineering.
Teeple, Wallace Douglas,	*Marengo*,	Architecture.
Templeton, Benjamin Franklin,	*Palestine*,	Ancient Languages.
Tominaga, Kotaro,	*Tokio, Japan*,	Agriculture.
Power, Willis Eugene,	*Chana*,	Chemistry.
Townsend, William,	*Champaign*,	Civil Engineering.
Train, Robert Farquhar,	*Hastings, Neb.*,	Architecture.
Trego, Charles Henry,	*Hoopeston*,	Mechanical Eng.
Wade, Lenoard George,	*Champaign*,	Chemistry.
Walton, Thomas Percival,	*Paxton*,	Civil Engineering.
Weaver, Leslie Alvord,	*Danville*,	Ancient Languages.
Williams, Scott,	*Bloomington*,	Mechanical Eng.
Winchell, Harley Corson,	*Champaign*,	Ancient Languages.
Wiswall, Thomas,	*Alexander*,	Civil Engineering.
Wraith, William,	*Streator*,	Mining Engineering.
Yeakel, William Krebel,	*Polo*,	Natural History.
Adams, Clara Louise,	*Mendota*,	Natural History.
Arnold, Mary Edna,	*Ulah*,	Ancient Languages.

†Deceased.

Beidler, Gertrude Lou,	*Champaign*,	Eng. and Mod. Lang
Boggs, Arclissa Florence,	*Urbana*,	Natural History.
Borden, Susan May,	*Champaign*,	Eng. and Mod. Lang.
McCaskrin, Louise Elizabeth,	*Rantoul*,	Natural History.
Myers, Maud Ossoli,	*Champaign*,	Eng. and Mod. Lang.
Naughton, Katheryn Louise,	*Champaign*,	Eng. and Mod. Lang.
Nichols, Maude E.	*Urbana*,	Chemistry.
Nydegger, Louise,	*Farmer City*,	Eng. and Mod. Lang.
Plaut, Mayme	*Danville*,	Eng. and Mod. Lang.
Powers, Jessie Lucie,	*Belvidere*,	Eng. and Mod. Lang.
Read, Josephine,	*Champaign*,	Eng. and Mod. Lang.
Ryder, Edith Marion,	*Monticello*,	Eng. and Mod. Lang.
Scott, Daisy Coffin,	*Champaign*,	Eng. and Mod. Lang.
Shawhan, Gertrude,	*Urbana*,	Eng. and Mod. Lang.
Swartwout, Mina Louisa,	*Dixon*,	Natural History.
Webber, Grace,	*Urbana*,	Natural History.
Wilder, Elizabeth C.	*Champaign*,	Eng. and Mod. Lang.
Wingard, Anna Laura,	*Champaign*,	Eng. and Mod. Lang.

PREPARATORY CLASS.

Abraham, Arthur Leonard,	*Watson*,	
Allen, Albert Miller,	*Hannibal, Mo.*,	Architecture.
Arends, Homer Albertus,	*Urbana*,	Eng. and Mod. Lang.
Arnold, Willard D.	*Haldane*,	Chemistry.
Ashley, Richard Jason,	*Tonica*,	Mechanical Engineering.
Ayers, Clarence Otto,	*Nashville*,	Natural History.
Barnes, Charles Earle,	*Decatur*,	
Barr, Richard James,	*Wilton Center*,	
Beebe, Fred Albert,	*Wisner, Neb.*,	Mechanical Eng.
Beeman, Marion Nelson,	*Robinson*,	Eng. and Mod. Lang.
Bissell, Frank,	*Farmer City*,	Eng. and Mod. Lang.
Boggs, Fortune Stanley,	*Urbana*,	
Boon, William G.	*Armstrong*,	Civil Engineering.
Boone, Charles Edwin,	*Chrisman*,	
Brode, Arthur Willis,	*Buda*,	Mechanical Eng.
Brown, Fred Gage,	*Urbana*.	
Buck, Charles Hamilton,	*Freeport*,	Chemistry.
Buck, James P.	*Bloomfield, Mo.*,	Eng. and Mod. L.
Burdsal, Charles Southerd,	*South Evanston*.	
Burt, James D.	*Aurora, Neb.*,	Architecture.

Campbell, George Henry,	*Edgewood*,	Natural History.
Carberry, Ray Shepard,	*Mansfield*,	Civil Engineering.
Carmack, Clyde Robert,	*Camargo*,	Mechanical Eng.
Chester, Henry Ezra,	*Champaign*.	
Chester, Wilfred Dudley,	*Champaign*,	Civil Engineering.
Cook, Harvey,	*Tolono*,	Chemistry.
Cornell, Frank Howe,	*Yorkville*,	Eng. and Mod. Lang.
Cowles, Roy Merrick,	*Englewood*,	Mechanical Eng.
Decius, Lyle,	*Toledo*,	Eng. and Mod. Lang.
Dillon, William Henry,	*Normal*,	Architecture.
Drake, Lewis Sanford,	*Chicago*,	Eng. and Mod. Lang.
Earley, John Allen,	*Batchtown*,	Civil Engineering.
Eaton, William Otis,	*Champaign*.	
Emmons, Henry Jeffers,	*Atkinson*,	Civil Engineering.
Erwin, Verna,	*Louis*,	Civil Engineering.
Farrand, Fred H.,	*Griggsville*,	Agriculture.
Fay, Frank Earle,	*Marengo*,	Civil Engineering.
Fellheimer, Alfred,	*Chicago*.	
Fletcher, Marcus Samuel,	*Ridge Farm*,	Civil Engineering.
Foster, Edward, Jr.,	*Armstrong*,	
Fowler, David,	*Charity*,	Eng. and Mod. Lang.
French, Ernest,	*Pana*.	
Granger, Guy,	*Champaign*.	
Grattan, William Taylor,	*Gallatia*.	
Green, James Albert,	*Ivesdale*,	Eng. and Mod. Lang.
Gulick, Seeley,	*Champaign*,	Chemistry.
Guthrie, Fred A.,	*Aledo*,	Eng. and Mod. Lang.
Hammett, John Burnham,	*Camargo*,	Natural History.
Heydenburg, Charles Alvin,	*Champaign*.	
Hoblit, John Alexander, Jr.,	*Atlanta*,	Eng. and Mod. Lang.
Hoffa, John,	*Forreston*,	Natural History.
Hoyt, William Judson,	*Chicago*,	Chemistry.
Hughes, Samuel Kelso,	*Kunkle, Ohio*,	Eng. and Mod. Lang.
Jameson, Stuart Wells,	*Farmer City*,	Ancient Lang.
Johnson, Claude Friend,	*Chandlerville*,	Ancient Lang.
Kasano, H. Yeizo,	*Tokio, Japan*,	Civil Engineering.
Kilgour, Cassius Mathers,	*Sterling*.	
Killam, Francis Grimes,	*Comer*,	Mechanical Eng.
Kirtley, Charles Wilson,	*Quincy*,	Mechanical Eng.
Lawson, John Bell,	*Harvey*,	Mechanical Eng.
Lee, Robert, Jr.,	*Cable*,	Civil Engineering.

Lewellyn, David Rossiter,	*Sterling.*	
Linderholm, Martin Julius,	*Altona,*	Civil Engineering.
Lotz, George Norton,	*Lockport,*	Eng. and Mod. Lang.
Lyons, Timothy John,	*Sadorus,*	Mechanical Engineering.
McKinney, George Bester,	*Barry,*	Mechanical Engineering.
McMains, Harrison,	*Armstrong,*	Civil Engineering.
McNutt, John, Jr.,	*Humbolt,*	Eng. and Mod. Lang.
Mann, Clyde Allison,	*Geneva.*	Chemistry.
Maxwell, Charles Jacob,	*Champaign,*	Chemistry.
Miller, Frank Arthur,	*Chicago,*	Mechanical Engineering.
Miller, Mortimer Ridell,	*Rockford,*	Civil Engineering.
Mogensen, Peter,	*Copenhagen, Den.,*	Civil Engineering.
Moore, Edward,	*Humbolt,*	Eng. and Mod. Lang.
Morrison, Charles Hugh,	*Odin,*	Eng. and Mod. Lang.
Morrow, Clarence Gifford,	*Champaign,*	Agriculture.
Myers, James William,	*Chrisman,*	Ancient Lang.
Naughton, Charles Colby,	*Champaign,*	Chemistry.
Parker, Walter A.,	*Champaign,*	Eng. and Mod. Lang.
Parry, Joseph Lawrence,	*Tolono,*	Eng. and Mod. Lang.
Pinkerton, Cyrus Bertram Eugene,	*Rantoul,*	Ancient Lang.
Pratt, Walter Merrill,	*Earlville,*	Mechanical Eng.
Ravlin, Frank West	*Kaneville,*	Civil Engineering.
Ravlin, Fred J.	*Kaneville,*	Mechanical Eng.
Reed, James Horatio,	*Evanston,*	Mechanical Eng.
Ricketts, Gil Bert,	*Fisher.*	Mechanical Eng.
Roberts, Francis Eugene,	*Chicago,*	Civil Engineering.
Sale, Leslie Oscar,	*Fisher.*	
Sanders, Ralston Harvey,	*Chicago,*	Mechanical Eng.
Schierbaum, Emanuel Albert,	*Grantfork.*	Natural History.
Schlacks, Joseph T.,	*Chicago.*	Mechanical Engineering.
Schricker, Richard Lælius,	*Davenport, Iowa,*	Mining Eng.
Scott, Hugh,	*Bethany.*	
Shepardson, John Eaton,	*Aurora.*	
Shurts, Richard Elmer,	*Champaign,*	Chemistry.
Smith, Martin Alonzo,	*LaMoille,*	Mechanical Engineering.
Smith, Simeon Carl Cecil,	*Griggsville,*	Architecture.
Spurgin, William Grant,	*Urbana,*	Ancient Languages.
Stoltey, Benjamin Franklin,	*Champaign,*	Architecture.
Stroker, George Dick,	*Palatine,*	Civil Engineering.
Stuart, Will Taylor,	*Cairo,*	Mechanical Engineering.
Sullivan, John Laurence,	*Mansfield,*	Eng. and Mod. Lang.

Swartz, William Commodore,	*Urbana*,	Eng. and Mod. Lang.
Tilton, Clinton Clay,	*Catlin*,	Eng. and Mod. Lang.
Warfield, Roy Mary,	*Quincy*,	Electrical Engineering.
Webster, Charles Carlton,	*Polo*,	Natural History.
Weedman, Fred John,	*Farmer City*,	Eng. and Mod. Lang.
Whittemore, Leonard Archie,	*Verona*,	Mechanical Eng.
Wilkinson, Arthur Lewis,	*Argenta*,	Natural History.
Withers, Arthur Seward,	*Englewood*,	Mechanical Eng.
Withers, William Aaron,	*Englewood*,	Chemistry.
Young, Clyde Cyrus,	*Stonington*,	Natural History.
Bauer, Bertha Lizzie,	*Bunker Hill*,	Eng. and Mod. Lang.
Boggs, Pearl,	*Urbana*,	Ancient Languages.
Bonner, Kate Porter Harper,	*Champaign.*	
Bryan, Willhelmie,	*Parkville.*	
Burton, Dora Francelia,	*Mahomet*,	Eng. and Mod. Lang.
Candy, Maie,	*Urbana*,	Ancient Languages.
Fisher, Cora,	*Champaign*,	Natural History.
Forbes, Bertha,	*Champaign.*	
Hicks, Estella,	*Rantoul*,	Eng. and Mod. Lang.
Hopper, Georgia Etherton,	*Lockport*,	Eng. and Mod. Lang.
Howse, Darlie P.	*Champaign.*	
Lewis, Sadie Annette,	*Cherry Point*,	Eng. and Mod. Lang.
Parker, Nettie Florence,	*Champaign*,	Natural History.
Parsons, Ella Belle,	*Trave, Iowa*,	Eng. and Mod. Lang.
Peck, Hattie,	*Fisher*,	Eng. and Mod. Lang.
Peck, Millicent Orville,	*Fisher*,	Eng. and Mod. Lang.
Pillsbury, Bertha Marion,	*Urbana*,	Ancient Languages.
Scott, Anna Maud,	*Champaign*,	Eng. and Mod. Lang.
Shepardson, Mary Frances,	*Aurora*,	Natural History.
Woolsey, Ola C.	*Polo*,	Eng. and Mod. Lang.

SPECIAL STUDENTS.

Allen, David Hammond,	*Delavan*,	Agriculture.
Allen, Fred Starbuck,	*Delavan*,	Agriculture.
Baker, William Alfred,	*Champaign*,	Microscopy.
Brawner, Charles L.	*Delavan*,	Agriculture.
Daughmer, Frank Ulysses,	*Douglas*,	Agriculture.
Gove, Aaron Morrill,	*Denver, Col.*,	Architecture.
Grayson, Franklin Charles,	*Paxton*,	Veterinary Science.

Hammett, Richard Clyde,	*Camargo*,	Agriculture.
Howe, Dick,	*Urbana*,	Architecture.
Hurst, Huizuiga Meschert,	*Springfield*,	Chemistry.
Kuhnen, Adolph,	*Highland*,	Agriculture.
Larimore, Edward Norton,	*Plainville*,	Agriculture.
Leeper, William R.,	*Coulterville*,	Agriculture.
Lodge, Charles Vanalbert,	*Monticello*,	Agriculture.
Richmond, Charles Albert,	*Villa Grove*,	Agriculture.
Russell, Joseph Edgar,	*Ipava*,	Agriculture.
Sims, L. J.	*Lincoln*,	Leveling.
Wilson, Charles Wesley,	*Shelbyville*,	Agriculture.
VanTine, Clarence,	*Suez*,	Agriculture.

Crannell, Emma,	*Champaign*,	Art and Design.
Gibbs, Mrs. Sarah,	*Marshalltown, Ia.*,	Art and Design.
McFadden, Lill,	*Champaign*,	Art and Design.
Maxwell, Nellie,	*Champaign*,	Art and Design.

SUMMARY.

BY CLASSES.	MEN.	WOMEN.	TOTAL.
Resident Graduates	1	2	3
Seniors	37	12	49
Juniors	49	6	55
Sophomores	90	11	101
Freshman	136	20	156
Preparatory	112	20	132
Special	19	4	23
Total	444	75	519
BY COURSES.			
Agriculture	22	....	22
Mechanical Engineering	78	....	78
Electrical Engineering	1	..... .	1
Civil Engineering	95	....	95
Mining Engineering	5	....	5
Architecture	73	....	73
Chemistry	50	1	51
Natural History	35	16	51
Art and Design	....	4	4
English and Modern Languages	52	43	95
Ancient Languages	12	5	17
Not Specified	21	6	27
Total	444	75	519

LIST OF GRADUATES OF 1890.

		Degree.	Course.
Barr, James,	*Urbana*,	B.S.,	Mech. Eng.
Bawden, Samuel Day,	*Champaign*,	B.S.,	Mech. Eng.
Beardsley, John,	*Champaign*,	B.L.,	Eng. and Sci.
Benson, Edward Mills,	*Colfax*,	B.S.,	Civil Eng.
Bennett, Cleaves,	*Mattoon*,	B.L.,	Eng. and Sci.
Bowsher, Columbus Austin,	*Barnett*,	Certificate.	
Boyle, Anna Cecilia,	*Champaign*,	B.L.	Eng. and Sci.
Brumbach, Lucia Ray,	*Gilman*,	B.L.,	Eng. and Sci.
Camp, Norman Harvey,	*Chanute, Kas.*,	B.S.,	Natural History.
Clark, Edith Louisa,	*Urbana*,	Certificate.	
Clark, Thomas Arkle,	*Urbana*,	B.L.,	Eng. and Sci.
Clark, Frank Henry,	*Urbana*,	B.S.,	Mech. Eng.
Clarkson, James Francis,	*Chicago*,	B.S.,	Civil Eng.
Cooke, Robert James,	*East Newbern*,	B.S.,	Civil Eng.
Cornelison, Robert Wilson,	*Washington*,	B.S.,	Chemistry.
Crabbs, Clarence Lincoln,	*Gibson City*,	B.S.,	Civil Eng.
Clinton, George Perkins,	*Polo*,	B.S ,	Natural History.
Ellars, Jessie,	*Tuscola*,	B.A.,	Ancient Lang.
Fisher, John Franklin,	*Indianola*,	B.S.,	Civil Eng.
Gilliland, William Myers,	*Coatsburg*,	B.S.,	Mech. Eng.
Hanssen, Gustavus Adolphus,	*Davenport, Ia.*,	Certificate.	
Hazleton, Hugh,	*Forest Glen*,	B.S.,	Mech. Eng.
Keene, Edward S.,	*Moline*,	B.S.,	Mech. Eng.
Kennard, Katherine Louise,	*Champaign*,	B.L.,	Eng. and Sci.
Kinkead, David Robinson,	*Earlville*,	B.S.,	Mech. Eng.
The same,		B.S.,	Civil Eng.
Manny, Walter Isham,	*Mounds*,	Certificate.	
Moore, Byron Llewellyn,	*Champaign*,	B.S.,	Chemistry.
McCandless, H. Wallace,	*Orion*,	B.S.,	Mech. Eng.
McKee, Will E.,	*Rising*,	B.S.,	Mech. Eng.
Nesbit, Edwin,	*Charleston*,	B.S.,	Mech. Eng.
Peoples, U. J. Lincoln,	*Allegheny City, Pa.*,	Certificate.	
Proctor, Orla A.	*Rome*,	B.S.,	Natural History.
The same,		B.L.,	Eng. and Sci.
Shamel, Charles H.,	*Willey*,	B.S.,	Chemistry.
Schaefer, Philemon A.	*Parral, Mexico*,	Certificate.	
Snyder, Christopher Henry,	*Fulton*,	B.S.,	Civil Eng.
Stevens, Fred Worthley,	*Odell*,	Certificate.	

Tresise, Frank John,	*Sharon, Pa.*,	B.S.,	Civil Eng.
Terbush, Linsley F.,	*Champaign*,	B.L.,	Eng and Sci.
Tscharner, John Baptiste,	*Okawville*,	B.S.,	Civil Eng.
Waterman, Fred Walter,	*Sycamore*,	B.S.,	Mech. Eng.
White, James McLaren,	*Peoria*,	B.S.,	Architecture.
Wilbur, Frank Dent,	*Champaign*,	B.L.,	Eng. and Sci.
Wilson, Robert Conover,	*Bloomington*,	B.S.,	Natural History.
Wilkinson, George Eldorado,	*Argenta*,	B.S.,	Natural History.
Sparks, Myrtle Eva,	*Champaign*,	M.A.,	Ancient Lang.
Ross, Luther Sherman,	*Reno*,	M.S.,	Natural History.

COMMISSIONED BY THE GOVERNOR AS CAPTAINS BY BREVET IN THE ILLINOIS NATIONAL GUARD.

Barr, James,
Bawden, Samuel Day,
Clark, Frank Henry,
Clarkson, James Francis,
Cooke, Robert James,
Crabbs, Clarence Lincoln,
Fisher, John Franklin,
Hazleton, Hugh,
Tresise, Frank John,
Waterman, Fred Walter,
White, James McLaren,
Wilkinson, George Eldorado.

Named to the Secretary of War as worthy of

SPECIAL COMMENDATION.

White, James McLaren, Crabbs, Clarence Lincoln,
Hazleton, Hugh.

WINNER OF THE HAZLETON PRIZE MEDAL.

Hubbell, James Pease.

WINNER IN THE COMPETITIVE DRILL.

Company A; Frank Harvey Eno, Captain.

WINNERS IN THE JUNIOR PRIZE SPEAKING CONTEST.

Green, Thomas Stephen, First Prize,
McCormick, Wirt, Second Prize.

HONORARY SCHOLARSHIPS.

The following named counties have been represented during the year by the students named:

Adams.	Woodruff, Thomas Tyson.
Brown.	Bartlett, Henry Emmett.
Bureau.	Forbes, Robert H.
Champaign.	Snodgrass, William, Jr.
Clinton.	Earl, Mark Alden.
Coles.	Bennett, Sarah.
Cook.	Hart, Ralph Warner.
Crawford.	Templeton, Benjamin Franklin.
Du Page.	Heideman, George Hermann.
Ford.	Lowry, James Percival.
Jasper.	Carrick, William.
Lee.	Swartwout, Mina Louisa.
Madison.	Suppiger, Albert Eugene.
Marshall.	Johnson, John Cummins.
Peoria.	Beasley, Harrison Easton.
Piatt.	Brown, Frank.
Rock Island.	Johnson, Harriette Augusta.
St. Clair.	Klingelhoefer, Charles Benjamin.
Scott.	Gibbs, William David.
Union.	Crawford, John.
Vermilion.	Yeomans, Frances Anna.
Wabash.	Leeds, Harmon Gibson.