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UNIVERSITY OF WISCONSIN BULLETIN.

No. 29.

General Series, No. 1.

JUNE, 1899.

Part 1.

CONTENTS.

COLLEGE OF LETTERS AND SCIENCE.

COLLEGE OF AGRICULTURE.

COLLEGE OF MECHANICS AND ENGINEERING.

COLLEGE OF LAW.

SCHOOL OF PHARMACY.

SCHOOL OF ECONOMICS, POLITICAL SCIENCE,
AND HISTORY.

SCHOOL OF MUSIC.

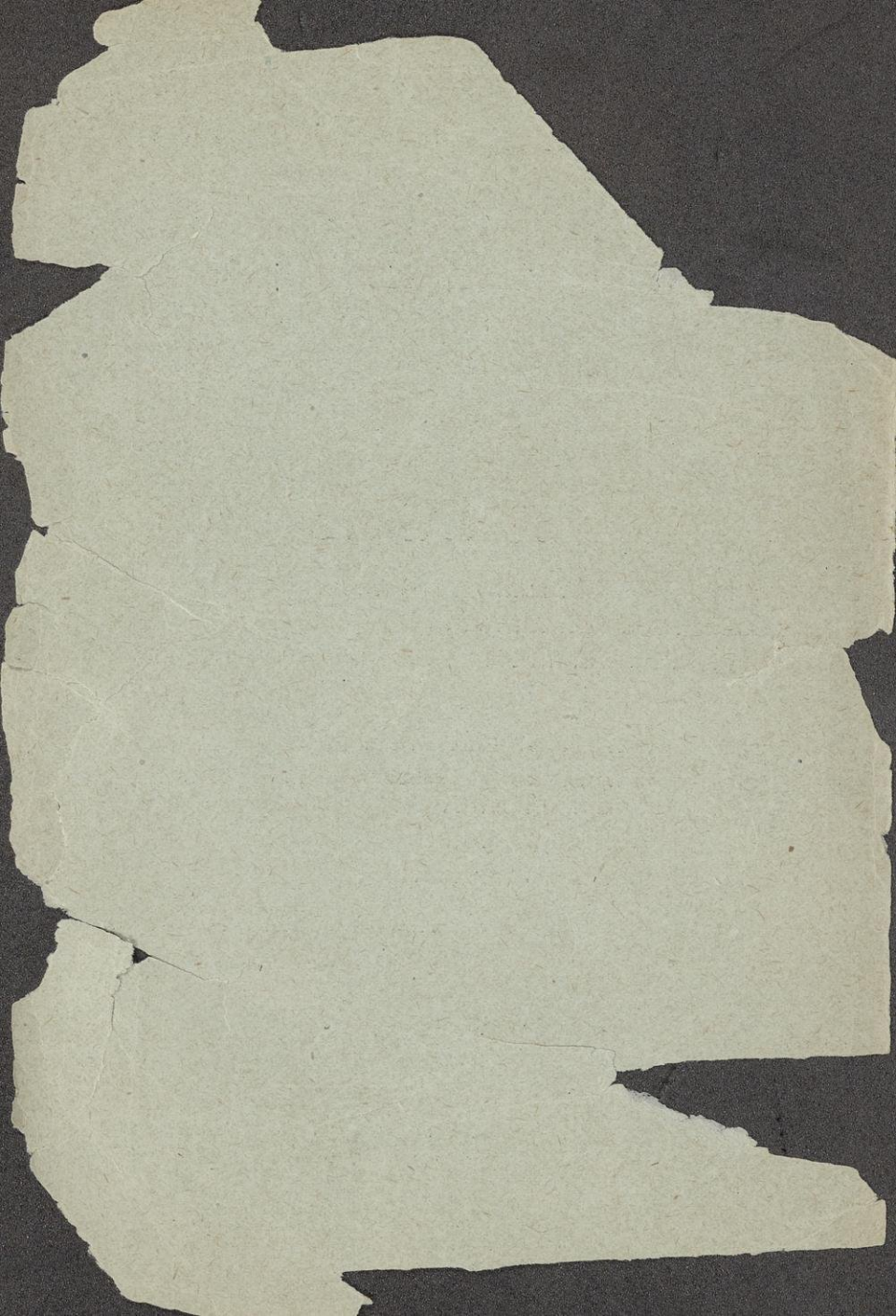
SCHOOL OF EDUCATION.

DEPARTMENT OF GRADUATE STUDY
LISTS OF TEACHERS AND STUDENTS.



MADISON, WIS.
Published by the University.

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CATALOGUE

OF THE

UNIVERSITY OF WISCONSIN

FOR

1898-99.

MADISON, WIS.
PUBLISHED BY THE UNIVERSITY.
1899.

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1899.

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JUNE

CALENDAR.

ACADEMIC YEAR, 1898-99.

FIRST SEMESTER, September 28—February 10.

SECOND SEMESTER—February 13—June 22.

Theses must be handed in, College of Letters and Science, College of Mechanics and Engineering, College of Law, School of Pharmacy, May 15.

Legal Holiday, Tuesday, May 30.

Examination of Candidates for Admission, Thursday and Friday, June 15, 16.

Baccalaureate Address, Sunday, June 18.

Class Day, Monday, June 19.

Address to Law Class, Tuesday June 20.

Alumni Day, Wednesday, June 21.

COMMENCEMENT, Thursday, June 22, 9 A. M.

SUMMER VACATION, June 23—September 26.

SUMMER SESSION opens July 3, closes August 11, six weeks.

ACADEMIC YEAR, 1899-1900.

FIRST SEMESTER opens September 27, closes February 10.

Examinations for Admission, Tuesday and Wednesday, September 26 and 27.

Registration Days, September 25—27.

First Recitations, Thursday Morning, September 28.

Legal Holiday, Thanksgiving, November 30.

Christmas Recess, Saturday, December 23—Monday, January 1. inclusive.

Examination Week, First Semester, February 5—9.

First Semester closes, Saturday, February 10.

SECOND SEMESTER opens Monday, February 12, closes June 21.

Registration Day, Second Semester, Monday, February 12.

Examination Days for Second Semester, Thursday and Friday, February 8, 9.

Legal Holiday, Thursday, February 22.

Easter Recess, Thursday, April 12—Monday, April 16, inclusive.

Legal Holiday, Wednesday May 30.

Examination Week, Second Semester, June 11—15.

Commencement, Thursday, June 21.

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School of Education and University Extension
Department. 120 S. Fairchild St.
COYLE, JOHN JOSEPH, *Secretary of the Deans of*
the College of Law. Law Building. 304 N. Carroll St.

ORGANIZATION.

The University embraces:

The Department of Graduate Study.

The Undergraduate Departments.

Both Graduate and Undergraduate courses are included in the following colleges and schools of the University.

I. The College of Letters and Science.

The School of Economics, Political Science, and History.

The School of Education.

The Washburn Observatory.

The Summer Session.

II. The College of Mechanics and Engineering.

III. The College of Agriculture.

IV. The College of Law.

V. The School of Pharmacy.

VI. The School of Music.

The College of Letters and Science embraces:

A. Graduate Courses.

B. Undergraduate Courses.

I. The Ancient Classical Course.

II. The Modern Classical Course.

III. The General Science Course.

IV. The English Course.

V. The Civic Historical Course. (School of Economics, Political Science, and History.)

VI. The Special Science Course, antecedent to Medicine.

VII. The Philosophical Course for Normal School Graduates.

The College of Mechanics and Engineering embraces:

A. Graduate Courses in Engineering.

B. Undergraduate Courses.

I. The Civil Engineering Course, including Railway, Bridge, Structural, Municipal, and Highway Engineering.

II. The Sanitary Engineering Course.

III. The Mechanical Engineering Course.

IV. The Electrical Engineering Course.

V. The Course in Applied Electro-Chemistry.

The College of Agriculture embraces:

- I. The Experiment Station.
- II. The Graduate Course.
- III. The Long Agricultural Course.
- IV. The Short Agricultural Course.
- V. The Dairy Course.
- VI. The Farmers' Institutes.

The College of Law embraces:

- I. The Three Years' Course.

The School of Pharmacy embraces:

- I. The Graduate Course.
- II. The Pharmacy Course.
- III. The Four Years' Pharmacy Course.

The School of Economics, Political Science, and History, embraces:

- I. The Graduate Courses.
- II. The Civic Historical Course.

The School of Education embraces:

- I. The Graduate Courses.
- II. The Course for Normal Graduates.
- III. Special Undergraduate Courses in Philosophy and Pedagogy.
- IV. The Department of University Extension.
- V. The Summer School.

The School of Music embraces:

- I. The Graduate Course.
- II. The Collegiate Course.
- III. The Academic Course.

THE UNIVERSITY AND THE STATE.

The University of Wisconsin is a part of the free school system of the State. It was established by the constitution when the State was organized in 1848. The organic law establishing the University declares that its object shall be: "to provide the

means of acquiring a thorough knowledge of the various branches of learning connected with scientific, industrial and professional pursuits." In the educational policy of the State, the University sustains the same relation to the high schools that the high schools sustain to the primary and grammar schools. As those who have successfully completed the grammar grades may freely avail themselves of the advantages of the high schools, so those who have completed with credit any high school courses may advance to the opportunities offered by the University. If the courses of study in the high schools are denominated the 9th, 10th, 11th, and 12th grades, the four years' University course may with similar propriety be regarded as the 13th, 14th, 15th, and 16th grades. It is not expected that every pupil who completes the grammar grades will advance to the high school, and it is not practicable for every one who completes the high school to go forward to the University. Still, the school system of the State has been so arranged as to make the passage from one grade to another as easy and natural as possible, in order to afford every encouragement to the most complete and thorough education attainable. The State through the University undertakes to furnish thorough instruction in the various branches of a liberal education, as well as in the technical branches of agriculture, engineering, pharmacy, law, pedagogy, and music.

It is the general policy of the institution to foster the higher educational interests of the State, broadly and generously interpreted. It is its aim to make ample provision for the demands of advanced scholarship in as many lines as its means will permit. By prescribing a large portion of the studies of the regular courses in the earlier years, and by leaving a large number in the later portion to the selection of the student, it endeavors to give a wise measure of direction and at the same time leave sufficient room for choice to encourage individual adaptation and special development.

The University avoids all that is sectarian or partisan; but it endeavors to extend its sympathy and influence to whatever contributes to good citizenship and high character.

THE SUPPORT OF THE UNIVERSITY.

The University is supported partly by the income of federal grants, partly by taxation of the people of the State, and partly by private gifts. For such support there have been five federal grants, namely: The Two-Township Grant of 1848; The Supple-

mentary Two-Township Grant of 1854; The Morrill Grant of 1862, for the support of studies pertaining to agriculture and mechanic arts; The Hatch Grant of 1887, for the support of agricultural experiment stations; and The Supplementary Morrill Grant of 1890.

Besides numerous appropriations for buildings and other specific purposes the State has made seven grants of a permanent nature, namely: the one-tenth mill tax of 1876, increased to one-eighth mill in 1883; the one-tenth mill tax of 1891; the appropriation for the support of the Observatory in 1887; the appropriation for the support of Farmers' Institutes of 1885, increased in 1887; the appropriation for the College of Engineering in 1889 of one per cent. of the railroad license tax; and the one-fifth mill grant of 1897. The legislature of 1899 consolidated the various mill taxes, specified above, and the grant of one per cent. of the railroad licenses, into a specific annual grant of \$268,000. This sum is equal to the annual revenue from these various grants.

Of the private gifts that have come to the University that of Dane County for the purchase of lands for the University farm, that of the late Governor C. C. Washburn for the founding of the Washburn Observatory, and that of the late Judge Mortimer M. Jackson for the establishment of the Mortimer M. Jackson Professorship of Law, have been the most considerable and important.

HISTORY AND LOCATION.

In 1838 an act was passed by the territorial legislature establishing the University of the Territory of Wisconsin, and appointing a Board of Visitors for its government. No action toward establishing the University was taken under this law except the selection of two townships of land appropriated by Congress. In 1848 the constitution of the State of Wisconsin made provision for the establishment of a State University.

In 1849 the Board of Regents held its first meeting and began the work of organizing the University. The first building (now North Hall) was constructed in 1851. Four years from that time Agricultural Hall was completed, and in 1861 University Hall was finished. It has often been altered interiorly, and in 1895 the building was provided with additional stairways and halls. In 1866 the University was reorganized by act of the legislature, which also provided for uniting with the University the College

of Agriculture, endowed with the proceeds of the Agricultural College grant given by the United States in 1862. In 1867 the first appropriation, of about \$7,000 a year, was made by the State. Since that date the State has made repeated and large appropriations of money for the construction of buildings and for providing apparatus, and also for meeting the ordinary expenses of the institution. The College of Law was established in 1868; the College of Engineering began its work in 1870; the School of Pharmacy in 1883, and the School of Economics, Political Science, and History in 1892. The Summer School was organized in 1887, the School of Music in 1895, the School of Education in 1897, and the Summer Session of the University in 1899.

The University of Wisconsin is picturesquely situated at Madison, the capital of the State of Wisconsin. The University grounds comprise 300 acres, and extend for more than a mile along the south shore of Lake Mendota, a sheet of water about four miles in width and six miles in length. University hill occupies the eastern part of the grounds. It rises abruptly from the lake and has two summits, of which the eastern and higher reaches a height of about one hundred feet above the lake. Most of the college buildings are placed on the summit and eastern slope of this hill. The western part of the grounds is lower and more nearly level, and is occupied by the Experimental Farm, belonging to the College of Agriculture. East of the University hill lies a small tract known as the Lower Campus, used for athletic sports and as the drill ground. At the session of 1893 the legislature provided for the purchase of Camp Randall for an athletic field. This is a tract of ground including 42 acres, and joining the University grounds to the southwest. In 1898 160 acres were purchased for a special experimental farm for the College of Agriculture.

The buildings of the University which are used for instructional purposes are thirteen in number. The three oldest, University Hall, North Hall, and Agricultural Hall, stand on or near the eastern summit of University hill. Agricultural Hall is occupied by the offices, lecture rooms, and laboratories of the College of Agriculture; North Hall is used by the departments of German and Scandinavian languages, and the School of Pharmacy; while University Hall contains the lecture rooms for most of the remaining departments of language and literature. These buildings were originally erected out of the money derived from sales of land granted by the national government. University

Hall has been greatly enlarged during 1898-99 by the addition of a large wing on the south side. This contains the offices of the President, the Dean of the College of Letters and Science, and the Registrar, a large lecture room seating about four hundred persons, besides numerous offices and recitation rooms. Across the east front of the campus, at the foot of University hill, is a row of more recent buildings, all of them erected at the expense of the State of Wisconsin. At the south is Ladies' Hall, built in 1870, remodeled and enlarged in 1896, and used as a dormitory for young women; next stands the Library and Library Hall, completed in 1879. Still further north is Science Hall, the largest and most costly of the University buildings, completed in 1887, containing the lecture rooms, laboratories, and museums of most of the scientific departments of the University, and those of the College of Engineering. Next to lake Mendota is the Chemical Laboratory, built in 1885, and behind this is the Machine Shop, erected in the same year and greatly enlarged in 1894. Near this building is the Central Heating Plant, built in 1894. Half-way up the slope of University hill, on the south side, is the building for the Law School, which, in addition to the library and lecture rooms of the College of Law, contains the offices of the Board of Regents, and the rooms of the School of Economics, Political Science, and History. Opposite the Law Building on the north side of the campus will stand the new building of the College of Engineering for which the legislature of 1899 has appropriated \$100,000. On the western summit of University hill is the Washburn Observatory, built in 1878 by the late Hon. C. C. Washburn, and presented to the University. Near it are the Students' Observatory and the astronomer's house. On the western slope of the hill is the building for the Dairy School, constructed in 1891, and near it are placed the building for the departments of horticulture and agricultural physics. Provision for an enlargement of the Dairy School and a Central Heating Plant was made by the legislature of 1899. The laboratories for horticulture were built in 1893, and the building was completed in 1896. Further west lie the numerous buildings of the Experimental Farm and the dwelling house for the Dean of the College of Agriculture. Between the lower campus and the lake is placed the Armory and Gymnasium, authorized by the legislature of 1891, and still nearer the lake is the University Boat House and the Rowing Tank. On the western part of the Lower Campus is the new Library for the State Historical Society and the University.

GOVERNMENT.

The government of the institution rests upon the inherent obligations of students to the University and to the state. The University is maintained at the public expense for the public good. Those who participate in its benefits are expected, as a matter of honor, not only to fulfill the obligations of loyal members of the institution, of the community, and of the commonwealth, but actively to aid in promoting the intellectual and moral interests. Every student owes to the public a full equivalent for its expenditure in his behalf, in the form of superior usefulness to it, both while in the institution and afterwards. Students therefore cannot claim any exemption from the duties of good citizens and of loyal members of the community and of the University; on the contrary, they are under peculiar obligations loyally to fulfill every duty. As members of the institution, they are held responsible for regular attendance and the proper performance of their duties. The interests of faithful students and the well-being of the University demand that those who do not conform to these manifest obligations should withdraw from the institution or be excluded. As members of the community, students are amenable to the law; and, if guilty of its infraction, are liable to a termination of their relations with the University. The University recognizes its civic relations and rests its administration upon civic obligations.

CLASS OFFICERS.

The care of the students in their studies is placed in charge of class officers, chosen from the Faculty. Each division of the classes is under such an officer, who directs the work of the students, assigns to each his studies and reports his progress at the end of each semester to his parent or guardian. The class officers receive all reports from instructors, both those on work completed at the end of the semester and special reports of deficiency or failure on the part of individuals. The position of Dean of Women has been established by the Board of Regents, and Dr. Annie Crosby Emery has been appointed to this position. In addition to performing the duties of Dean of Women, Dr. Emery fills the position of Assistant Professor of Classical Philology.

LIBRARIES.

The libraries of the University are the General Library, the Law Library, the Agricultural Library, and the Woodman Astronomical Library. They contain in the aggregate over 57,000 volumes and 17,000 unbound pamphlets.

The General University Library, including the department libraries catalogued therewith, contains over 51,000 volumes and 15,000 unbound pamphlets. More than 500 periodicals are regularly received. The catalogue is the usual dictionary card catalogue of authors, subjects, and titles in one alphabetic arrangement. Subject to certain restrictions, books may be drawn by all members of the University. Students are required to make a guarantee deposit of \$2.00 with the Secretary of the Board of Regents preliminary to borrowing books from the library. This amount is refunded on presenting to the Secretary the library deposit card properly endorsed by the librarian. For consultation the library is open twelve hours daily during the academic year except on Sundays and legal holidays.

Through the kindness of Prof. Edward T. Owen, the General Library contains on deposit the Owen library of works on French language and literature, numbering 900 volumes. Special appropriations in recent years have rendered the library especially strong in the lines of economic and political science, and in classical philology.

During the past year liberal German-American citizens of Milwaukee have contributed a considerable sum of money (\$3,200) for the purchase of a Germanic philology seminary library. This fund will be used at once to supplement and develop the German department of the library, thus furnishing unexcelled facilities for the study of the German language and literature.

At the opening of the college year a course of lectures on the library and methods in library work is given to new students by the University librarian.

The College of Law has a special library of 4,000 volumes; and the Washburn Observatory is provided with the Woodman Astronomical Library, now containing 2,400 books and 2,200 pamphlets. Students also have free access to the State Law Library, comprising about 32,500 volumes, and by special arrangements are enabled to take out books from the free library of the city of Madison. This is a well-selected collection of over 16,000 volumes.

The library of the State Historical Society contains over 104,000 volumes and 100,000 pamphlets. It is exceptionally rich in manuscript and other material for the study of the history of the Mississippi valley. The collections of the late Dr. Lyman C. Draper are included in the library. Its files of newspapers and periodicals are among the most complete in the United States. There are over 5,000 volumes of bound newspapers published outside of Wisconsin, and the files cover, with but few breaks, the period from the middle of the seventeenth century to the present. There is an excellent collection of United States government documents, and the material for the study of American local history, Western travel, the Revolution, Slavery, and the Civil War, is unusually abundant. In English history the library possesses the Calendars of State Papers, the Rolls Series, the publications of the Camden Society, the Records Commission, and the Historical Manuscripts Commission, the journals and debates of Parliament, and several important collections for the study of local history. The Tank collection (Dutch) offers facilities for the study of the Netherlands. The library of the Historical Society is accessible to all students of the University, and thus affords exceptional facilities for the prosecution of advanced historical work. The historical seminaries of the University have been generously granted special facilities in the rooms of the library. The Historical, State, University, and City libraries afford duplicate copies of historical material most in use, and to a large extent supplement one another.

The State legislatures of 1895, 1897, and 1899 made provision for a fire proof building for the libraries of the State Historical Society and the University. The erection of this building is in charge of a commission, selected by the Governor, the State Historical Society, and the Regents of the University. The building is placed on the western part of the lower campus of the University. The library is already enclosed and the completion of the interior is in active progress and the building will be completed in 1900.

LABORATORIES.

Chemical Laboratories.—The Chemical Laboratories, six in number, are in a building devoted exclusively to Chemistry. Four of these are general laboratories, viz.:

First. The Qualitative Laboratory, with accommodations for ninety-six students; *Second.* The Organic Laboratory, accom-

modating thirty-two students; *Third*. The Quantitative Laboratory, accommodating forty-eight students; and *Fourth*. The Laboratory of Physical Chemistry, accommodating twenty-five students.

These laboratories are large, well-lighted, conveniently arranged, and well supplied with the necessary apparatus and equipments.

Physical Laboratories.—The instruction in the department of physics is designed to meet the needs of all classes of students, from those just entering, with no knowledge of the subject, to those who have been well trained, and who are prepared to continue in the more advanced courses or to take up a line of original investigation.

The Physical Laboratories are located on the first floor and in the basement of the south wing of Science Hall, and are commodious and well lighted. Besides the lecture room and large apparatus room on the first floor, there are two laboratory rooms for purposes where great steadiness is not required. The lecture room has a seating capacity for 150 students, and is provided with all the appliances to facilitate a complete course of experimental lectures. In the basement are three large general laboratories for undergraduate work, all of which are liberally supplied with piers to insure the perfect stability of the instruments used. There are also in the basement a well-equipped photometric room and a number of laboratories devoted to special investigation. Besides current supplied from the numerous dynamos in the University shops, the various rooms of the physical laboratory are connected with the electric light and power circuits of the city.

The physical apparatus includes, in addition to the equipment for demonstration purposes, an excellent collection of instruments adapted to measurement and investigation. The laboratory offers special facilities for carrying out graduate study and research.

The Mineralogical Laboratory.—The laboratories for mineralogy are located on the second floor of Science Hall, and consist of a room fitted with desks and chemical reagents for course in blowpipe analysis and determinative mineralogy, and a goniometer room which can be darkened for the study of crystals. In the mineralogical lecture room are the necessary models of crystals in glass and wood, and working collections of crystals and minerals.

The Petrographical Laboratory.—This laboratory is a large, well lighted room supplied with numerous polarizing microscopes, other apparatus, and a very complete set of rocks and of rock and mineral sections, for complete courses in optical mineralogy and petrology. The general and special collections mentioned under Museums are available for all advanced students of petrology.

The lecture room for geology is provided with a full set of reference manuals, a set of Zittel's *Palaeontologische Wandtafeln*; a large relief map of the United States by E. E. Howell; a set of Shaler's models and photographs; a set of Davis' models showing the development of topographic features; numerous geological maps; a large collection of lantern slides; Newton's large electric projecting lantern, and other apparatus. The Newton lantern is adapted for projecting ordinary lantern slides, and has a front for microscopic slides, which projects directly on the screen thin sections of rocks both in ordinary and polarized light.

The Biological Laboratories.—The elementary laboratory for the departments of botany and zoology is arranged to accommodate seventy-two students, and is provided with compound microscopes, dissecting microscopes, and other apparatus necessary to an elementary course in botany and zoology. The departments have about ninety compound microscopes, chiefly by Leitz and by Bausch & Lomb, fitted for elementary and advanced work.

The laboratories for advanced work in botany are fitted up with the apparatus and reagents necessary to advanced courses in vegetable histology, physiology, and cytology. All necessary reagents, ovens, paraffin baths, and microtomes are provided for histological, and catological work.

The laboratories for advanced work in zoology are two in number, one being devoted to histology, and the other to vertebrate anatomy and embryology. The histological laboratory is provided with a full equipment of reagents, microtomes of various patterns, and microscopes. The anatomical laboratory is furnished with a collection of vertebrate skeletons and of wax models illustrating the development of some of the more important vertebrates and invertebrates. For illustrating the lectures in botany and in zoology, there are Auzoux-models, both of plants and animals, an electric projecting lantern and microscope, over 600 lantern slides, a large number of wall charts, microscope slides, etc.

The bacteriological laboratories are located in Agricultural Hall. The general laboratory occupies a part of the second floor; it accommodates twenty students, giving ample facilities for independent work. The laboratory is supplied with compound microscopes of late pattern, comprising the best American and German makes. The laboratory is well equipped with the usual supply of sterilizers and incubators, kept at different constant temperatures, as well as numerous pieces of apparatus of home manufacture intended for investigational and instructional purposes. A large and constantly increasing supply of pure cultures of bacteria is kept on hand.

A laboratory for advanced and graduate students is to be built this year. This will be especially equipped for work with the pathogenic bacteria. Special facilities will be offered in the way for private rooms for individual work.

The research laboratory of the Experiment Station occupies a part of the first floor, and is well equipped for original investigation. The green houses of the Experiment Station and the University Creamery afford facilities for the prosecution of work on plant diseases and dairy products. Nearly all of the general bacteriological journals are kept on file in the library for ready reference. A collection of lantern slides for lecture illustration is also in use.

The Psychological Laboratory.—The laboratory is designed to illustrate by practical experiments and demonstrations the courses in psychology; to give an opportunity to students of experimental psychology to study the methods, equipments, and results of this science; and to provide for original research in many directions.

Original research has been carried on for several years and the more important results have been published in the *American Journal of Psychology*, the *Psychological Review*, and elsewhere.

In addition to four series of studies from the laboratory already published, the work done in the laboratory has been the basis of several articles that have appeared or are about to appear in various periodicals, as well as of theses submitted for degrees.

The engineering, assaying, pharmacy, and agricultural laboratories are described under their respective departments.

UNIVERSITY MUSEUMS.**Officers.**

CHARLES KENDALL ADAMS, LL. D., President of the University.

ROBERT A. HARPER, Ph. D., Professor of Botany, Curator for Botany.

WILLIAM S. MARSHALL, Ph. D., Assistant-Professor of Zoology, Curator for Zoology.

WILLIAM S. MILLER, M. D., Assistant Professor of Vertebrate Anatomy, Curator for Vertebrate Anatomy.

WILLIAM H. HOBBS, Ph. D., Assistant Professor of Mineralogy and Petrology, Curator for Mineralogy and Petrology.

J. MORGAN CLEMENTS, Ph. D., Assistant Professor of Geology, Curator for Geology and Paleontology.

The University Museums comprise the Geological and Mineralogical Museum, the Biological Museum, and the Herbarium, which occupy respectively the second and third floors of the south wing of Science Hall. The collections in the College of Engineering, College of Agriculture and School of Pharmacy are described in later pages.

The Geological and Mineralogical Museum has been built up for the most part with special reference to instructional work. It contains material for the thorough illustration of various lines of mineralogy and geology.

The Museum includes a large number of relief models to illustrate topographical and geological features, casts of gigantic fossil forms, and systematic collections of minerals, crystals, rocks, fossils, ores, etc. In the mineral collection is included the Henry Collection, rich in minerals from southern Wisconsin, and in the paleontological collection is the Powers collection of Wisconsin Silurian fossils. The collection of the Wisconsin Academy of Sciences, in which are included the type fossils described in the volumes of the First Geological Survey is deposited in the Museum. The rock collection includes Sturz's collection of typical European rocks, the Rohn collection of typical rocks from the Lake Superior region, and a number of other special sets.

A number of additional special collections are at present stored in the lecture rooms, laboratories, and offices, and are accessible to students interested. These include a collection of over 30,000 specimens, with about 15,000 thin sections, belonging to the Lake Superior Division of the United States Geological Survey, one of the largest of its kind in the world; a large col-

lection of New England rocks belonging to the same Survey; the collections of the Wisconsin Geological Survey; and the Hobbs collection, mainly of European rocks, supplied with over 1,000 thin sections. Of technical interest are the special collections of metallurgical, pharmaceutical, and engineering specimens, and the collection of Wisconsin building stones made by the Wisconsin Geological Survey.

The Zoological and Botanical Museum occupies the entire third story of the south wing of Science Hall, directly above the geological museum. Among the specimens at present placed in the cases may be named a good collection of vertebrate skeletons; a large number of Blaschka glass models of invertebrates; an alcoholic collection of invertebrates from the Naples Zoological Station; representative collections of echinoderms, corals, and mollusks. The botanical cases contain a collection of Auzoux models of flowers and a collection of specimens of wood. The Owen collection of Lepidoptera, comprising five thousand species, and over twenty thousand specimens, is deposited in Science Hall.

The Herbarium of the University (Room 41, Science Hall) includes the Lapham collection, chiefly of flowering plants, purchased by the State from the estate of I. A. Lapham, of Milwaukee. This contained about 8,000 species. These have been mounted and arranged, and are now accessible for consultation. The Wisconsin plants have been separated from the rest, and it is the intention to make them a basis of a complete representation of the Wisconsin flora. Large additions have been made to this herbarium by Prof. L. S. Cheney and Prof. H. L. Russell.

Mr. Lapham's collections also included a considerable number of algae, lichens, and mosses. The collection of mosses has been very greatly extended by gifts, purchases, exchanges, and collections, so that it now includes almost all of the species known in North America, and a large number of those of other countries. Many valuable types and sets of exsiccati are included.

The Herbarium also sends out a small party during each summer for collecting plants of the state. In the past four seasons the Wisconsin river valley has been explored and several thousand specimens added to the Wisconsin herbarium.

When the museums are not open to the public, access may be gained by visitors at all reasonable hours by calling upon the janitor of the building, whose room is on the first floor of Science Hall.

THE WASHBURN OBSERVATORY.

The Washburn observatory is excellently equipped for astronomical work. Its principal instruments are: An equatorially mounted telescope of 15½ inches aperture, constructed by Alvan Clark and Sons, and provided with graduated circles, driving clock, micrometers, a spectroscope, astro-photometer, and a very complete set of eye-pieces; a meridian circle, by A. Repsold and Sons, of Hamburg, with collimators, and the usual accessories of such an instrument.

A full account of the Washburn Observatory will be found on a later page, under the College of Letters and Science.

PHYSICAL TRAINING.

Military drill and gymnastic exercises are required of the young men of the Freshmen and Sophomore classes, and of special students of the first two years' attendance. Gymnastic exercise is also required of the young women, for whom a thoroughly equipped gymnasium has been provided. The University is situated on the shores of lake Mendota, a beautiful sheet of water, which invites exercise and recreation in boating. The University Boat House Association has erected a boat house, and the University has built a Rowing Tank for the use of the University crew.

An Athletic Field of about ten acres has been enclosed in Camp Randall. The field has been graded, under-drained, provided with two tracks, one-third and one-fourth mile; and a grand stand has been built accommodating 1,500 spectators.

PUBLICATIONS OF THE UNIVERSITY.

The University issues four series of publications, known as the *Bulletins of the University of Wisconsin*, under the direction of a Committee of Publication, consisting of the President of the University and the following editors:

William H. Hobbs, Ph. D., (Chairman), Editor of the Science Series.

Charles Forster Smith, Ph. D., Editor of the Language and Literature Series.

Frederick J. Turner, Ph. D., Editor of the Economics, Political Science, and History Series.

Nelson O. Whitney, C. E., Editor of the Engineering Series.

The numbers which have been issued are the following:

Economics, Political Science, and History Series.**Volume 1.**

No. 1. The Geographical Distribution of the Vote of the Thirteen States on the Federal Constitution, 1787-8, by Orin Grant Libby, A. M., with an introduction by Frederick J. Turner. Pp. 116, pls. 2.

No. 2. The Finances of the United States from 1775 to 1789, with Especial Reference to the Budget, by Charles J. Bullock, A. B. Pp. 157.

No. 3. The Province of Quebec and the Early American Revolution. A study in English-American Colonial History, by Victor Coffin, Ph. D. Pp. 307.

Volume 2.

No. 1. New Governments West of the Alleghanies since 1780, by George Henry Alden, Ph. D. Pp. 74.

No. 2. Municipal History and Organizations of the City of Chicago, by Samuel Edwin Sparling, Ph. D. Pp. 113.

In preparation:

No. 3. Congressional Grants of Land in Aid of Railways, by John B. Sanborn, M. L.

Science Series.**Volume 1.**

No. 1. On the Speed of Liberation of Iodine in Solutions of Hydrochloric Acid, Potassium Chlorate, and Potassium Iodide, by Herman Schlundt. Pp. 33.

No. 2. On the Quartz Keratophyre and Associated Rocks of the North Range of the Baraboo Bluffs, by Samuel Weidman. Pp. 21, pls. 3.

No. 3. Studies in Spherical and Practical Astronomy, by George C. Comstock. Pp. 50.

No. 4. A Contribution to the Mineralogy of Wisconsin, by William Herbert Hobbs. Pp. 48, pls. 5.

No. 5. Analytic Keys to the Genera and Species of North American Mosses, by Charles Reid Barnes and Fred DeForest Heald. Pp. 211.

Volume 2.

No. 1. On the Action of Dilute Electrolytes on the Sense of Taste, by Louis Kahlenberg, Ph. D., Assistant Professor of Physical Chemistry, University of Wisconsin. Pp. 31.

Language and Literature Series.**Volume 1.**

No. 1. The Development of American Literature from 1815 to 1833, by William B. Cairns, Ph. D. Pp. 87.

In preparation:

No. 2. The Treatment of Nature in the Poetry of the Roman Republic, by Katharine Allen, M. A.

Engineering Series.**Volume 1.**

No. 1. Track, by L. F. Loree, M. Am. Soc. C. E., Pp. 24.

No. 2. Some Practical Hints in Dynamo Design, by Gilbert Wilkes, M. Am. Inst. E. E. Pp. 16.

No. 3. The Steel Construction of Buildings, by C. T. Purdy, C. E. Pp. 27.

No. 4. The Evolution of a Switchboard, by A. V. Abbott, C. E. Pp. 32, pls. 4.

No. 5. An Experimental Study of Field Methods Which Will Insure to Stadia Measurements Greatly Increased Accuracy, by Leonard Sewell Smith, B. C. E. Pp. 45, pl. 1.

No. 6. Railway Signaling, by W. McC. Grafton, C. E. Pp. 38.

No. 7. Emergencies in Railroad Work, by L. F. Loree, M. Am. Soc. C. E. Pp. 42.

No. 8. Electrical Engineering in Modern Central Stations, by Louis A. Ferguson, A. B. Pp. 33.

No. 9. The Problem of Economical Heat, Light, and Power Supply for Building Blocks, School Houses, Dwellings, etc., by G. Adolph Gerdtzen, B. S. Pp. 69.

No. 10. Topographical Surveys, their Methods and Value, by J. L. Van Ornum, C. E. Pp. 39.

Volume 2.

No. 1. A Complete Test of Modern American Transformers of Moderate Capacity, by Arthur Hillyer Ford, B. S., with an introduction by Professor D. C. Jackson. Pp. 88.

No. 2. A Comparative Test of Steam Injectors, by George Henry Trautmann, B. S., with an introduction by Professor Storm Bull. Pp. 34.

No. 3. The Superintendent of Bridges and Buildings, by Onward Bates, C. E. Pp. 30.

The Washburn Observatory issues the *Publications of the Washburn Observatory*, edited by Professor George C. Comstock, now in its tenth volume.

From the College of Agriculture are issued the *Quarterly Bulletins* of which thus far ninety-five have appeared; the *Annual Reports*, now numbering fourteen; and the *Bulletin of the Farmers' Institutes*, of which eleven numbers have appeared.

Besides the official publications of the University the following publications are edited at the University:

Bulletins of the Wisconsin Geological and Natural History Survey, edited by Professor E. A. Birge, Director.

Transactions of the Wisconsin Academy of Sciences, Arts, and Letters, edited by Professor A. S. Flint, Secretary.

The Pharmaceutical Review, edited by Professor Edward Kremers.

The Wisconsin Journal of Education, edited by Professor John W. Stearns.

GENERAL INFORMATION.

CHARGES AND FEES—GENERAL CHARGES.

All fees are required to be paid strictly in advance at the beginning of each semester, before cards are issued by the class officer entitling the student to admission to class; except those in the College of Law as indicated below. Graduate students, except honorary fellows, pay the same fees as undergraduates, whether they are in attendance at the University or *in absentia*.

Tuition is free for all students from the State of Wisconsin, except in the College of Law.

After ten days from the beginning of the semester, no fees are returned except by special vote of the Board of Regents.

College of Letters and Science, College of Mechanics and Engineering, School of Pharmacy, School of Economics, Political Science, and History, School of Education.

Tuition for non-resident students, per semester.....	\$9.00
Incidental fee for all students, per semester.....	6.00
Additional fee for students electing studies in the College of Law, per year.....	25.00

College of Agriculture.

Long course, tuition for students not residents of Wisconsin, per semester.....	\$9.00
Long course, incidental fee for all students, per semester..	6.00

In the Short course and Dairy course there are no incidental fee nor tuition charge for students who have been residents of Wisconsin for one year before their first admission to the University.

Short course, incidental fee for students not residents of Wisconsin	\$10.00
Short course, tuition charge for students not residents of Wisconsin	6.00
Dairy course, incidental fee for students not residents of Wisconsin	10.00
Dairy course, tuition charge for students not residents of Wisconsin	6.00
Dairy course, lecture fee for students not residents of Wisconsin	10.00

College of Law.

Tuition fee, first year	\$75.00
Tuition fee, second year	50.00
Tuition fee, third year	25.00
Tuition fee for students graduating in one year.....	100.00

The fees for students graduating in two years are the same as in the first two years of the three year course.

The fees in the College of Law are to be paid for the year at the beginning of the first semester. There is no additional fee for non-resident students in this College.

Summer Session and Wisconsin Summer School.

General fee, admitting to ten hours per week.....	\$10.00
Additional fee for five additional hours per week, or fraction thereof	5.00

Summer School of Library Science.

General fee for full course.....	\$15.00
Fee for special course in cataloguing.....	10.00

School of Music.

Persons who are members of other colleges or schools of the University may take the courses of music specified on page 133 without charge. Members of the School of Music and of other departments, who take special lessons, will pay fees as stated in the announcement of the School on a subsequent page of the catalogue.

Ladies' Hall.

Room rent, heat, and light, see page 42.

Board in Ladies' Hall, payable to the Matron, per week... \$3.50

These fees are subject to change at the opening of the College year.

LABORATORY FEES.

Biological Laboratories.—The laboratory fee for the elementary course in biology and for most of the advanced courses is \$8.00 per year. The fee for vertebrate histology, for embryology, and for bacteriology, \$8.00 per semester.

Chemical Laboratories.—In these laboratories the deposit for a year's course is twenty dollars. The amount refunded will depend on the chemicals used and the care exercised by the student. The ordinary cost of a year's course is from fifteen dollars to twenty dollars.

Geology and Mineralogy.—Blowpipe analysis, per semester, \$5.00, blowpipe analysis, two-fifths study, \$2.00; three-fifths study, \$3.00; petrography, per semester, \$5.00.

Physical Laboratories.—The laboratory fee in the physical laboratories is \$2.00 for each unit-hour (two hours per week of actual work) per semester.

Psychological Laboratory.—The laboratory fee for the course in Experimental Psychology is \$3.00; for other experimental work \$3.00 per semester, \$5.00 per year.

College of Engineering.—The charge for laboratory work is \$1.50 per unit-hour (two hours per week of actual work) per semester. There is also a charge of \$1.50 per year for periodicals, supplied to the Engineering Reading Room.

School of Pharmacy.—For general laboratory privileges a charge is made of \$1.00 per unit hour and semester. A separate account will be kept with the accountant of the storage room for special apparatus and material. The student will purchase coupons from the Secretary of the Board of Regents (\$5.00 at a time) and present them at the storage room. At the end of the year full credit will be given for such pieces of apparatus as are taken back, in accordance with the rules of the storage room.

College of Agriculture.—The following laboratory fees are required: Dairy School Laboratory, \$6.00; Farm Dairy Laboratory, \$1.00; Bacteriology; University Students, \$8.00; Advanced Dairy Course, \$6.00; Pasteurizing Course, \$1.00; Shop-work, \$5.00.

Students of the Long Course in Agriculture pay for gas and for apparatus at the same rate as in the General Chemical Laboratory.

GYMNASIUM AND MILITARY DRILL.

Young men in the College of Letters and Science, College of Mechanics and Engineering, and the four-year courses in Agriculture and Pharmacy, are required to take gymnastic exercises during the first two years of their course, and are also required to take military drill. Students required to drill must provide

themselves with a uniform. This should be procured at Madison, and costs about fifteen dollars.

Gymnasium fee	\$2.00
Locker fee	1.50

Young women are required to take gymnastic exercises during the first two years of their course. A gymnasium fee of \$1.00 per year is required, and \$1.00 additional from those who make use of a locker. They must also provide themselves with a suitable costume; directions for which will be furnished by the instructor in gymnastics on application.

Students entering the four-year academic or technical courses of the University should expect to pay the fee for general expenses (\$6), and if not residents of the State, the tuition fee (\$9) mentioned above; the gymnasium fees (\$2 or \$3.50) and laboratory fees for such courses as begin in Freshman year. Young men must be prepared to defray the cost of a uniform, about \$15, and young women must provide a gymnasium suit.

ROOMS AND BOARD.

Rooms, furnished and unfurnished, can be obtained in the city at reasonable rates. The cost of board in clubs is from \$2.00 to \$2.50 per week; in private families from \$2.50 to \$4.00 per week. Washing costs from sixty to sixty-five cents per dozen. Many of the students support themselves in whole or in part. The places offering available work are eagerly sought for and cannot always be obtained at once. Those dependent on themselves should secure some means before coming here, and be ready to wait and learn how to help themselves.

LADIES' HALL.

Ladies' Hall was entirely rebuilt and greatly enlarged in 1896. The rooms are now arranged in suites of two, comprising a study and a chamber, and intended for two occupants, or in single rooms, intended for one student. The building will accommodate in this way eighty students.

The rooms are lighted by electricity and the heating apparatus is now connected with the central boiler plant, so that there is no fire for heating in the building. Freight and passenger elevators, operated by electricity, are provided.

An account of the Woman's Gymnasium will be found under the heading Physical Culture on a later page of the catalogue.

The rooms for the Department of Music, which are now entirely confined to the new addition, comprise offices, rooms for practicing, and a large lecture room.

Students' rooms are carpeted and furnished, but occupants are expected to provide washstand furniture, towels, napkins, napkin rings, sheets, pillow cases, counterpanes, and blankets. Young women occupying this building are under the immediate charge of the Mistress of Ladies' Hall, and are required to board in the Hall. They are expected cheerfully to conform to the requirements necessary for a family of students. No deduction is made for voluntary absence, and any commutation of charges for board in cases where students leave before the close of the semester, except in cases of necessity, is entirely voluntary with the matron in charge. The cost of board is \$3.50 per week.

The prices of rooms at Ladies' Hall vary according to location. Persons occupying a room may retain the same for the succeeding year by application and making a deposit of \$10 not later than May 1st. The deposit of \$10 required from all students, new as well as old, to secure a room, will be credited on the rent of the room, if taken; but if the room is not taken, will be forfeited, unless notification is received by the Secretary prior to September 1st. Application for rooms and the payment of fees for the same should be made in all cases to the Secretary of the Board of Regents, who will assign all rooms. The balance due for room rent must be paid to the Secretary, not later than the second week after the beginning of each semester. Rooms are rented to *bona fide* students of the University only. Application for rooms may be made at any time, but rooms will not be assigned to new students prior to May 1st. After that date they will be assigned in the order of application and the payment of the \$10, and subject to the provision above made for former occupants.

If for any reason one of the occupants of a suite shall be obliged to give up her place in the suite, the remaining person must take a single room, if one is vacant, or pay the price for the full suite, during the time it is occupied by her alone.

A person entering the Hall for the second semester only, shall pay the price of the room charged for the second semester, with the additional sum of \$10.

LIST OF ROOMS IN LADIES' HALL WITH RENT OF EACH.

"A" is the first floor; "B," the second, etc.

Floor.	Room No.	Suits for Two or Single.	To Secure.	1st Semester.	2d Semester.	Total for Each Person.
A	1	Suite	\$10	\$20	\$10	\$40
A	2	"	10	25	15	50
A	3	"	10	25	15	50
A	4	"	10	25	15	50
A	5	"	10	25	15	50
A	6	"	10	20	10	40
B	1	Suite	10	20	10	40
B	2	"	10	25	15	50
B	3	"	10	25	15	50
B	4	"	10	25	15	50
B	5	"	10	25	15	50
B	6	"	10	20	10	40
B	7	"	10	20	10	40
B	8	"	10	25	15	50
B	10	Single	10	40	30	80
B	12	"	10	45	35	90
B	14	"	10	40	25	75
*B	16	"	10	50	35	95
B	20	"	10	40	30	80
B	22	"	10	40	30	80
B	24	"	10	45	35	90
B	26	"	10	40	30	80
B	28	"	10	45	30	85
B	30	"	10	30	20	60
B	11	"	10	20	10	40
B	13	"	10	20	15	45
*B	15	"	10	25	15	50
*B	17	"	10	25	15	50
C	1	Suite	10	20	10	40
C	2	"	10	25	15	50
C	3	"	10	25	15	50
C	4	"	10	25	15	50
C	5	"	10	25	15	50
C	6	"	10	20	10	40
C	7	"	10	20	10	40
C	10	Single	10	40	30	80
C	12	"	10	45	35	90
C	14	"	10	40	25	75
C	16	"	10	40	25	75
C	18	"	10	40	25	75
C	20	"	10	40	25	75
C	22	"	10	40	25	75
C	24	"	10	45	35	90
C	26	"	10	40	30	80

Floor.	Room No.	Suits for Two or Single.	To Secure.	1st Semester.	2d Semester.	Total for Each Person.
C	28	Single	\$10	\$40	\$30	\$80
C	30	"	10	25	15	50
*C	Parlor	"	10	45	35	90
C	21	"	10	20	15	45
C	23	"	10	20	15	45
C	25	"	10	25	15	50
C	27	"	10	25	15	50
C	29	"	10	25	15	50
C	31	"	10	20	15	45
*D	8	Single	10	30	20	60
D	10	"	10	25	20	55
D	12	"	10	30	20	60
D	14	"	10	25	15	50
D	16	"	10	25	15	50
D	18	"	10	25	15	50
D	20	"	10	25	15	50
D	22	"	10	25	15	50
D	24	"	10	30	25	65
D	26	"	10	25	15	50
D	28	"	10	25	20	55
D	30	"	10	20	15	45
*B	16	If occupied by two.	10	25	15	50
*B	15		10	10	10	30
*B	17		10	10	10	30
*C	24		10	25	15	50
*C	Parlor		10	25	15	50
*D	8		10	15	10	35

ROOMS AND BOARD.

Rooms, furnished and unfurnished, can be obtained in the city at reasonable rates. The cost of board in clubs is from \$2.00 to \$2.50 per week; in private families from \$2.50 to \$4.00 per week. Washing costs from sixty to sixty-five cents per dozen. Many of the students support themselves in whole or in part. The places offering available work are eagerly sought for and cannot always be obtained at once. Those dependent on themselves should secure some means before coming here, and be ready to wait and learn how to help themselves.

CHARGES AND FEES.

A full statement of charges and fees is given on pages 37-39.

THE COLLEGE YEAR.

The college year is divided into two semesters. The first semester opens on the last Wednesday in September. Registration and examinations for admission will be held on the preceding Tuesday, and on the opening day of the semester. The second semester will ordinarily begin on the second Monday in February; in the present college year the date of the opening second semester was February 14, 1899. The studies of the University have been so arranged that students can begin their course with the second semester; but persons desiring to enter the University at this time should come to Madison during the week preceding the opening of the second semester, as the recitations will begin on Tuesday morning, and all arrangements for rooms, board, books, etc., as well as registration at the University must be made before that time. Commencement occurs on the Thursday preceding the last Wednesday in June. In 1899 the date will be Thursday, June 22.

There are two recesses or vacations during the college year, one at Christmas and one at Easter. The Christmas recess begins with the morning of December 24th, and recitations are resumed on the morning of January 3d. No regular class examinations occur at Christmas, and no new classes begin immediately after the Christmas recess, so that students can not enter the University at this time. Those who can not enter at the opening of the year must wait for the beginning of the second semester in February. There is no vacation between the first and second semesters.

The Easter recess occurs at Easter, beginning with the Thursday morning before Easter Sunday. Recitations will begin on the morning of Tuesday following Easter. No examinations are held at the time and no new classes begin after the Easter recess.

LITERARY AND SCIENTIFIC SOCIETIES, STUDENT PUBLICATIONS.

The literary societies, the Athenaeum, Hesperian, and Philomathian, composed of gentlemen, and the Castalian, composed of ladies, are sustained with unusual interest and constitute an important means of intellectual training. Numerous public exhibitions are given by these societies, of which the annual Joint Debate between two of the gentlemen's literary so-

cieties is the most important literary event of the college year. This debate has now been maintained for twenty-five years. In oratory the main public events are the Junior Oratorical Exhibition, and the Annual Contest for the selection of a representative in the annual meeting of the Northwestern Oratorical League.

Besides these literary societies in the College of Letters and Science, three similar organizations are maintained in the College of Law, and two in the College of Agriculture. The College of Engineering maintains two engineering societies; and in the School of Pharmacy there is a Pharmaceutical Association. The most important scientific organization is the Science Club, including both officers of instruction and advanced students, which seeks to promote an interest in scientific study and research. It conducts public meetings for the untechnical discussion of scientific topics of current interest to which all members of the University are invited. A bronze medal, executed by T. Moring, London, will be annually awarded by the Club for the best thesis on a scientific subject. In several departments of the University there are held journal clubs or societies for furthering the distinct work of the departments. Among these are, the Bildungsverein; the Germanistische Gesellschaft; a Scandinavian society, the Nora Samlag; the Classical Club, the English Literature Journal Club, the Mathematical Club, the Physics Journal Club, the Biological Club, the Geological Club and the Chemical Club. In other departments where no such organization has been effected similar results are reached by means of the various seminaries. The graduate students of the University have organized a Graduate Club, and the women have organized a Woman's Self Government Association. The religious organizations of the University include the Young Men's Christian Association with a membership of 212, and the Young Women's Christian Association with a membership of 105.

The publications conducted by the students include the *Daily Cardinal*, the *Alumni Cardinal*, a weekly edition issued for the benefit of the Alumni; a monthly journal, the *Wisconsin Aegis*; and an annual, the *Badger*, issued by the Junior Class. The students of the College of Engineering issue a quarterly publication, the *University of Wisconsin Engineering Magazine*.

DEGREES.

FIRST DEGREES.

The baccalaureate degrees are conferred at graduation upon those who have successfully completed the regular courses leading to degrees, and who have conformed with all other requirements of the University. The degrees for the several courses are as follows:

Academic.

BACHELOR OF ARTS, for the Ancient Classical Course.

BACHELOR OF SCIENCE, for the General Science Course.

BACHELOR OF LETTERS, for the Modern Classical, the English, and the Civic Historical Courses.

BACHELOR OF PHILOSOPHY IN PEDAGOGY for the Course for Normal Graduates.

Professional.

BACHELOR OF LAWS, for the Law Course.

GRADUATE IN PHARMACY, for the Pharmaceutical Course.

BACHELOR OF SCIENCE IN PHARMACY, for the Four Years' Pharmacy Course.

Technical.

BACHELOR OF SCIENCE IN AGRICULTURE, for the Agricultural Course.

BACHELOR OF SCIENCE IN ENGINEERING, for the courses in Civil Engineering, Mechanical Engineering, Sanitary Engineering, Electrical Engineering, and Applied Electro-Chemistry.

A graduate of any one of the courses may receive the baccalaureate degree of any other course by completing the additional studies required in that course, but two baccalaureate degrees cannot be taken in one year. For a second bachelor's degree in the College of Letters and Science there are required one year's additional study and a special thesis.

The conditions on which the bachelor's degrees are given will be found stated under the appropriate colleges and courses on subsequent pages.

HIGHER DEGREES.

The University confers the degrees of *Master of Arts*, *Master of Letters*, and *Master of Science* upon graduates who have previously taken the degrees of Bachelor of Arts, Bachelor of Letters, and Bachelor of Science in the College of Letters and Science. The degree of *Master of Philosophy* is conferred on those who have taken the degree of Bachelor of Philosophy in Pedagogy. The degree of *Doctor of Philosophy* is also granted. The conditions on which these degrees are given will be found stated under the Department of Graduate Study on pages 54-56.

The higher degrees of *Civil Engineer*, *Mechanical Engineer*, and *Electrical Engineer* are conferred as second degrees in the College of Engineering. The degree of *Master of Pharmacy* is conferred as a second degree upon Graduates in Pharmacy and the degree of *Master of Science in Pharmacy* is given as a second degree to Bachelors of Science in Pharmacy.

The degree of *Master of Science in Agriculture* is conferred on Bachelors of Science in Agriculture.

The conditions on which these second degrees in the professional colleges are granted will be found stated under Department of Graduate Study and also under the head of the respective colleges.

HONORS.

HONORS IN SPECIAL STUDIES.

Honors are given at graduation for special work of high order of excellence done in any department. Such honors will be voted by the Faculty to those students whose graduation theses show exceptional excellence and who have completed with unusual success a long course of study in the department in which the thesis is presented. The thesis must show work additional to all requirements for graduation equal to two hours per week for one year. Students desiring to become candidates for special honors in any department must make application to the Faculty at the opening of the second semester through the professor in whose department the honors are sought.

UNDERGRADUATE SCHOLARSHIPS.**The John A. Johnson Scholarships.**

The University is indebted to the liberality of the Hon. John A. Johnson, of Madison, for ten scholarships of the annual value of about \$35 each, established under the following conditions.

The sum received by one student in one year shall not exceed \$50, nor the sum received during his college course exceed \$200. Until the year 1900 the sum will be limited to students speaking one of the Scandinavian languages (Norse, Swedish, Danish, or Icelandic). No student can receive aid from this fund unless he has attended a common school one year, or has attended the University one year. The recipient of aid will be expected to return the money received by him to the fund, if he shall at any time be able to do so. The income of the fund will be dispensed by a committee of the Faculty. This committee consists of the President of the University* and Professors Olson and Bull.

The Amelia H. Doyon Scholarships.

By the will of Mrs. Amelia H. Doyon, late of Madison, the University has received a gift of five thousand dollars, to be known as The Amelia H. Doyon Fund. The income from this fund is to be divided into two equal parts, to be designated as The Amelia H. Doyon Scholarships, which are to be given to two young women in attendance at the University, to be selected by the Faculty. In making this selection the Faculty is to take into consideration the scholarship or standing of the persons selected and their need of financial help. Neither of these scholarships is to be bestowed on any young woman who has not been in attendance as a student at the University of Wisconsin for at least one year.

Hebrew Scholarship.

The Hebrew Lectureship and Scholarship Society will give a scholarship of \$250 for special excellence in Hebrew studies. This is at present held by Mr. Louis B. Wolfenson.

The Biblical Alliance of Wisconsin offers a sum of money, at present amounting to fifteen hundred dollars, to provide scholar-

ships for the encouragement of studies in the department of Hebrew and Hellenistic Greek. These may be held by graduates or undergraduates. Award is made on basis of excellence. Information regarding the scholarships will be given on application to Professor Williams.

An account of the Graduate Fellowships and Scholarships is given on later pages.

DEPARTMENT OF GRADUATE STUDY.

COMMITTEE ON GRADUATE STUDIES.

- C. K. ADAMS, LL. D., President of the University.
C. F. SMITH, Ph. D., Professor of Greek and Classical Philology.
Chairman.
E. A. BIRGE, Ph. D., Sc. D., Dean of the College of Letters and Science.
W. A. HENRY, Agr. B., Dean of the College of Agriculture.
R. T. ELY, Ph. D., LL. D., Director of the School of Economics, Political Science, and History.
J. C. FREEMAN, LL. D., Professor of English Literature.
D. C. JACKSON, C. E., Professor of Electrical Engineering.
EDWARD KREMERS, Ph. D., Professor of Pharmaceutical Chemistry.
W. H. ROSENSTENGEL, A. M., Professor of the German Language and Literature.
J. W. STEARNS, LL. D., Director of the School of Education.
C. A. VAN VELZER, Ph. D., Professor of Mathematics.
F. J. TURNER, Ph. D., Professor of American History.

ORGANIZATION.

The Graduate Department is organized for the encouragement of research at the University.

The University aims to afford adequate means for advanced study and research, and excellent facilities have already been provided along important lines. Personal assistance is rendered by professors to graduates according to individual needs. Classes for advanced students are organized and seminars are conducted in which original research may be carried on.

The advanced studies of the various departments lead to graduate work. The preparation of theses by members of the senior class, and the courses of instruction leading to theses, are intended to foster the spirit of investigation, and to serve as an introduction to research work. Under the opportunities for elective studies the undergraduate student is enabled to concentrate

work upon a leading line of study for several years, so that in his senior year he is enabled to do advanced work in certain classes designed for graduates and undergraduates.

Graduates from this University, and from other colleges and universities of recognized standing, and other advanced students suitably qualified, are permitted to become members of the graduate department.

The Regents of the University have established fellowships for the encouragement of graduate study; and in all of its departments the University furnishes abundant facilities for the publication of the results of original research. The laboratories and library facilities of the University, which are good in all lines, and are unexcelled in some directions, have been already described on preceding pages.

UNIVERSITY FELLOWSHIPS.

For the purpose of promoting higher scholarship and more extended original study than the academic courses afford, the Board of Regents has established ten University Fellowships of \$400 each, of which two are specially devoted to Latin and Greek.

The following are the regulations respecting these fellowships:

1. Any fellowship to which the present regulations apply may be held by any graduate of a college of recognized standing or by any one whose education is equivalent to that represented by a college degree. Those about to take such a degree are eligible as candidates, the regulations applying to the time of entrance upon the duties of the fellowship. Men and women are equally eligible.

2. Fellowships will be granted upon application only; such application, with accompanying evidence of merit, attainment, and ability, to be in the hands of the President before May 1st of the collegiate year preceding that during which the fellowship is held.

3. All fellowships will be filled each year. Fellows may be re-elected for one additional year only.

4. Applications must be accompanied by evidence of scholarship, ability, and general worthiness; such as theses (whether prepared for this or other purposes), published writings, testimonials from instructors, outline of educational course pursued, special distinctions gained, and the like. Applications for re-appointment should contain a full account of the work of the

preceding year. Applications to receive attention must contain a definite statement of the special studies which the applicant intends to pursue.

5. The fellowships will be assigned to the several departments according to the studies which the fellows intend to pursue.

6. Each fellow shall pursue his studies under the direction of the professor or professors in charge of his special studies. Assignment of University services to the fellows shall be made by the President in consultation with the head of the department to which the fellow has been assigned, and the work assigned may be equivalent to one hour of teaching daily, or the supervision of laboratory work for two hours daily.

7. At a meeting of the Faculty in the month of May (which meeting shall be duly announced as the meeting of the election of fellows), the President shall call upon the several heads of the departments in which applications have been received, to make a statement of the merits of the candidates in their departments; after all such statements have been made, the members of the Faculty will cast their ballots for as many candidates as there are fellows to be elected, and those receiving the highest number of votes (provided that each receive a majority of the votes cast) shall be recommended to the Board of Regents for appointment to fellowships.

Vacancies in fellowships due to resignation or other cause may be filled, as they occur, at the option of the Faculty.

HONORARY FELLOWSHIPS.

The Regents have established Honorary Fellowships, equal in number to the regular fellowships, and filled in a similar way. No compensation is attached to these positions except the remission of University fees, and no teaching service is required from these fellows. Persons who have held fellowships in the University and who desire to continue graduate studies after the expiration of the term of the fellowship may be elected to honorary fellowships. Candidates for fellowships qualified in every respect to hold a regular fellowship, who desire to devote all of their time to study rather than perform the teaching service required of regular fellows, may be elected honorary fellows; but no person is eligible to an honorary fellowship unless he be a graduate of at least one year's standing.

PHARMACEUTICAL FELLOWSHIPS.

Through the generosity of friends of the School of Pharmacy, funds have been provided for the following fellowships in pharmacy:

The August Uihlein Fellowship.

Mr. August Uihlein, of Milwaukee, has generously established a pharmaceutical fellowship on a financial basis of \$400 per annum for four years. The holder of this fellowship during the year 1898-99 is Mr. William S. Ferris, B. S., U. W. '98.

The Fred Vogel, Jr., Fellowship.

The sum of \$500 generously contributed by Mr. Fred Vogel, Jr., of Milwaukee, for advanced work, was divided so as to make a graduate scholarship of \$250 per annum for two years. The holder during the year 1898-99 is Victor A. Bassett, A. B., Knox College.

UNIVERSITY SCHOLARSHIPS FOR GRADUATES.

Through the generosity of an alumnus two graduate scholarships of the value of \$250 each are awarded annually in the literary department of the University. One of these, called the *William F. Allen Graduate Scholarship*, is held by Miss A. N. Scribner, a graduate of the Ancient Classical Course; the other, called the *J. C. Freeman Graduate Scholarship*, is held by Mr. E. H. Kronshage, a graduate of the Ancient Classical Course.

A friend of the University has founded a scholarship of the value of \$200 annually, open to graduate students of Norwegian ancestry.

The Regents of the University have established two graduate scholarships of the value of \$200 each; one in European history; the other in American history.

German Americans of the city of Madison, wishing to awaken and encourage a deeper interest in the study of German from an historical and comparative point of view, have provided for a *University Graduate Scholarship in German Philology* of the annual value of \$250 for each of the collegiate years ending June, 1899, 1900, and 1901. The scholarship is held by Miss Harriet Burnton during the present year.

Applications for this scholarship, which was available for the first time in June, 1898, ought to be made before May 1st, to the professor in charge of German philology in the University, Dr. Ernst Voss, Madison, Wis.

HIGHER DEGREES.**SECOND DEGREES.**

The degrees of *Master of Arts*, *Master of Letters*, and *Master of Science* are conferred upon graduates who have previously taken the degrees of Bachelor of Arts, Bachelor of Letters, and Bachelor of Science, respectively, and who, after graduation, pursue an approved course of study equivalent to the work of one year of graduate studies in the University and who present a satisfactory thesis upon the leading subject pursued. Students who desire to do part of their work for the master's degree by correspondence, or *in absentia*, may accomplish by either of these methods not more than half of the work required for the degree. At least one semester must be spent in residence at the University.

The work must consist of one major and one minor subject, must be in the general line of advanced study implied by the degree sought, and must be approved by the Committee on Graduate Studies. Two-thirds of this study must be devoted to the major subject and one-third to the minor. Study for a profession will not be accepted, but original investigation in connection with a profession, or special and scholarly study collateral to it, may be accepted, in the discretion of the Faculty. A thesis showing creditable original research must be presented at least one month before the close of the academic year, and if the thesis is satisfactory an examination will be conducted by a committee of the Faculty on the major and minor subjects.

Graduates of this or of similar institutions who pursue the course in law at the University, and who, by reason of their superior training, are able to take additional studies advantageously, may receive a second degree at graduation from the Law School on condition of having satisfactorily pursued graduate studies in the College of Letters and Science equivalent to five hours a week during two years of their course, and on conforming to the other required conditions.

The degrees of *Civil Engineer*, *Mechanical Engineer*, *Mining Engineer*, *Metallurgical Engineer*, and *Electrical Engineer* are conferred as second degrees upon Bachelors of Science in the Civil, Mechanical, Mining, and Metallurgical, and Electrical Engineering courses respectively, (1) who pursue advanced professional study at the University for one year, and present a satisfactory project or thesis; or (2) who furnish suitable evidence of three

years of professional work (of which one must be spent in a position of responsibility) and present a satisfactory thesis.

The degree of *Master of Pharmacy* will be conferred upon Graduates in Pharmacy who satisfactorily complete a course of one full year at the University in advanced pharmacy, or in some science or sciences specially allied to pharmacy, and who shall present a satisfactory thesis embodying the results of original investigation.

The degree of *Master of Science in Pharmacy* will be conferred upon Bachelors of Science in Pharmacy, under conditions similar to those required for second degrees in the College of Letters and Science.

THIRD DEGREE..

The degree of *Doctor of Philosophy* will be conferred upon successful candidates after three years of graduate study, of which the last year or the first two years must be pursued at this University. This degree will not, however, be conferred simply on the ground of the completion of study for the prescribed length of time. Special attainments are requisite; particularly the power of original thought and independent investigation. The candidate will be examined on three subjects, one major and two minors, which must be approved by the Committee on Graduate Studies not later than the beginning of the year in which the candidate expects to take the degree. A thesis must be presented which shall give evidence of original research and independent treatment. The applicant must announce himself as a candidate at least as early as the beginning of his last year of study, and his thesis must be placed in the hands of the Committee on Graduate Studies at least two months before the close of the academic year. The subject of the thesis must have the approval of the head of the department in which the major subject is carried on as early as November 1st of the collegiate year in which the candidate expects to take his degree.

In case the candidate is successful, he is required to put his thesis into print and deposit one hundred copies of the same in the Library of the University. If the thesis is printed in some journal, or as a Bulletin of the University, reprints therefrom will be accepted by the Librarian, but these must be provided with a special cover and title-page in proper thesis form. The diploma may be conferred before the thesis is printed,

provided a written or typewritten copy is deposited with the Librarian, and the sum of fifty dollars with the Secretary of the Board of Regents. The money will be refunded on presentation of the printed copies.

All candidates for this degree must have a reading knowledge of French and German at least one year before the degree is conferred.

COURSES OF INSTRUCTION FOR GRADUATES.

In each of the departments of the University, graduate courses of instruction are offered, to which the courses offered for graduates and undergraduates of suitable attainments serve as an introduction. These courses are described on subsequent pages under the heading, Departments of Study, in the College of Letters and Science, College of Engineering, College of Agriculture, and School of Pharmacy.

In most departments the graduate courses change from year to year so that a consecutive course of graduate study can be elected, extending over two or three years.

EXPENSES.

The expenses for graduate students are the same as those for undergraduates. The tuition for students not residents of Wisconsin is \$9.00 per semester. The general incidental fee is \$6.00 per semester. A diploma fee of \$5.00 is required. The cost of board in clubs is from \$2.00 to \$2.50 per week; in private families from \$2.50 to \$4.00 per week. Students working in the laboratories are required to pay a fee to cover the cost of materials and instruments used by them. A list of these charges and deposits will be found under the head of Charges and Fees, on pages 37-39.

COLLEGE OF LETTERS AND SCIENCE.

STAFF OF INSTRUCTION.

- C. K. ADAMS, LL. D., President of the University.
E. A. BIRGE, Ph. D., Sc. D., Dean and Professor of Zoology.
L. W. AUSTIN, Ph. D., Assistant Professor of Physics.
L. S. CHENEY, M. S., Assistant Professor of Pharmaceutical Botany.
J. M. CLEMENTS, Ph. D., Assistant Professor of Geology.
VICTOR COFFIN, Ph. D., Assistant Professor of European History.
G. C. COMSTOCK, Ph. B., LL. B., Professor of Astronomy.
C. A. CURTIS, A. B., Professor of Military Science and Tactics.
W. W. DANIELLS, Sc. D., M. S., Professor of Chemistry.
J. E. DAVIES, A. M., M. D., LL. D., Professor of Electricity and Magnetism and Mathematical Physics.
L. W. DOWLING, Ph. D., Assistant Professor of Mathematics.
J. C. ELSOM, M. D., Professor of Physical Culture.
R. T. ELY, Ph. D., LL. D., Professor of Political Economy.
ANNIE C. EMERY Ph. D., Assistant Professor of Classical Philology.
D. B. FRANKENBURGER, A. M., Professor of Rhetoric and Oratory.
J. C. FREEMAN, LL. D., Professor of English Literature.
W. F. GIESE, A. M., Assistant Professor of Romance Languages.
R. A. HARPER, Ph. D., Professor of Botany.
C. H. HASKINS, Ph. D., Professor of Institutional History.
H. W. HILLYER, Ph. D., Assistant Professor of Organic Chemistry.
W. H. HOBBS, Ph. D., Assistant Professor of Mineralogy and Petrology.
F. G. HUBBARD, Ph. D., Professor of the English Language.
JOSEPH JASTROW, Ph. D., Professor of Experimental and Comparative Psychology.
LOUIS KAHLENBERG, Ph. D., Assistant Professor of Physical Chemistry.
ALEXANDER KERR, A. M., Professor of the Greek Language and Literature.

- A. A. KNOWLTON, A. M., Assistant Professor of English.
A. G. LAIRD, Ph. D., Assistant Professor of Ancient Languages.
W. S. MARSHALL, Ph. D., Assistant Professor of Zoology.
ABBY S. MAYHEW, Mistress of Ladies' Hall, Director of Gymnastics for Women.
W. S. MILLER, M. D., Assistant Professor of Vertebrate Anatomy.
J. E. OLSON, B. L., Professor of the Scandinavian Languages and Literature.
M. V. O'SHEA, B. L., Professor of the Science and Art of Teaching.
E. T. OWEN, A. B., Professor of the French Language and Literature.
F. A. PARKER, Professor of Music.
J. B. PARKINSON, A. M., Professor of Constitutional and International Law.
W. H. ROSENSTENGEL, A. M., Professor of the German Language and Literature.
H. L. RUSSELL, Ph. D., Professor of Bacteriology.
W. A. SCOTT, Ph. D., Professor of Economic History and Theory.
F. C. SHARP, Ph. D., Assistant Professor of Philosophy.
E. B. SKINNER, A. B., Assistant Professor of Mathematics.
M. S. SLAUGHTER, Ph. D., Professor of Latin.
C. S. SLICHTER, M. S., Professor of Applied Mathematics.
C. F. SMITH, Ph. D., Professor of Greek and Classical Philology.
B. W. SNOW, Ph. D., Professor of Physics.
H. A. SOBER, A. B., Assistant Professor of Latin.
J. W. STEARNS, LL. D., Professor of Philosophy and Pedagogy.
R. H. TRUE, Ph. D., Assistant Professor of Pharmacognosy.
F. J. TURNER, Ph. D., Professor of American History.
C. R. VAN HISE, Ph. D., Professor of Geology.
C. A. VAN VELZER, Ph. D., Professor of Mathematics.
E. K. J. H. VOSS, Ph. D., Assistant Professor of German Philology.
W. H. WILLIAMS, A. B., Professor of Hebrew and Hellenistic Greek.
KATHARINE ALLEN, Ph. D., Assistant in Latin.
ARTHUR BEATTY, Ph. D., Instructor in English.
W. B. CAIRNS, Ph. D., Instructor in English.
A. N. COOK, M. A., Assistant in Chemistry.
J. E. DAVIES, B. L., Student Assistant in Gymnastics.
R. E. N. DODGE, M. A., Instructor in English.
E. S. FERRY, B. S., Instructor in Physics.

- R. E. FOWLER, B. S., Assistant in Chemistry.
 W. D. FROST, M. S., Instructor in Bacteriology.
 LUCY M. GAY, B. L., Instructor in French.
 SABENA M. HERFURTH, M. L., Assistant in German.
 SALLY P. HARRIS, Assistant in Physical Culture.
 G. S. ISHIKAWA, Student Assistant in Gymnastics.
 E. D. JONES, Ph. D., Instructor in Statistics and Economics.
 F. T. KELLY, B. S., Instructor in Hebrew and Hellenistic Greek.
 O. G. LIBBY, Ph. D., Instructor in History.
 F. W. MEISNEST, B. S., Instructor in German.
 B. H. MEYER, Ph. D., Instructor in Sociology.
 F. B. PETERSON, B. L., Student Assistant in Gymnastics.
 A. R. PRIEST, M. A., Instructor in Elocution.
 J. F. A. PYRE, Ph. D., Instructor in English Literature.
 J. W. RAYMER, B. S., Assistant in Chemistry.
 ✓ P. S. REINSCH, Ph. D., LL. B., Instructor in Political Science.
 HARRIET T. REMINGTON, M. L., Instructor in German.
 THEODORE RUNNING, M. S., Assistant in Mathematics.
 A. R. SEYMOUR, M. L., Assistant in French.
 C. M. SMITH, B. S., Instructor in Physics.
 GRANT SMITH, B. S., Assistant in Botany.
 L. M. SOLOMONS, Ph. D., Instructor in Psychology.
 ✓ S. E. SPARLING, Ph. D., Assistant in Political Science.
 SUSAN A. STERLING, M. L., Instructor in German.
 E. A. THURBER, M. A., Instructor in English.
 R. W. WOOD, A. B., Instructor in Physics.

ADMISSION TO THE UNIVERSITY.

I. EXAMINATIONS AT THE UNIVERSITY.

The regular examinations of the University are two in number; one in June and one in September. The earlier one is intended for those who wish to be examined while fresh from their preparatory studies and thus to set at rest all doubts as to their admission; and for those who wish to test their qualifications at an early date that they may have time to make up deficiencies if necessary. The September examination immediately precedes the opening of the fall term.

For the current year the earlier examinations will be held on Thursday and Friday, June 15th and 16th, beginning at 9 o'clock A. M. The later examinations will be held on Tuesday and

Wednesday, September 26th and 27th, beginning at 9 o'clock A. M. Students who are in any doubt as to their qualifications are urged to present themselves in June. All candidates are required to be present at 9 o'clock on the first day of the examinations.

Examinations will also be held on Thursday and Friday, February 8 and 9, 1900.

The examinations will cover the following topics:

GROUP I. *Subjects required of all candidates:*

- a. **Geography**, political and physical.
- b. **History of the United States**: Channing, Thomas, Johnston, Montgomery (students), or an equivalent.
- c. **Arithmetic**.
- d. **Algebra**: Addition, subtraction, multiplication, division, equations of the first degree with one unknown number, simultaneous equations of the first degree, factors, highest common factor, lowest common multiple, quadratic equations, simultaneous equations above the first degree, theory of indices (positive, negative, fractional, and zero), and radicals.

Geometry: Plane and solid geometry. In solid geometry special attention should be given to the geometry of the sphere.

- e. **English in General**: No pupil will be accepted in English whose written work is notably deficient in point of *spelling, punctuation, idiom, or division into paragraphs*.
- f. **English Composition**: 1. The candidate will be required to write two essays of not less than two hundred words each, on subjects chosen by himself from a considerable number—perhaps ten or fifteen—set before him in the examination paper, and one of the topics chosen must be taken from the books assigned for general reading under English Literature.
2. In place of the essay on the topic drawn from the books set for general reading, the candidate will be allowed to offer an exercise book containing the first draft of essays written during his preparatory course, on topics taken from the works prescribed for general reading. These essays must be written under the eye of the teacher without consulting the books from which the subjects are taken, and without other assistance, must be kept in the care of the teacher, and sent by him to the examiner

at least one week before the date of the entrance examination, with his certificate that they have been written in accordance with these requirements.

- g. **English Literature.** The following lists include (1) a series of books for general reading, which may also be used as a basis for work in English Composition; (2) a limited number of masterpieces for thorough study. In addition to the essays called for under the head of *English Composition*, there will be required such further tests as seem suited to secure a careful reading of all the books prescribed in series (1). The written statement of the teacher will be sufficient, in general, for this purpose. In the case of the books set for more thorough study, the candidate will be examined on subject-matter, form, and substance, and the examination will be of such a character as to require a thorough study of each of the works named, in order to pass it successfully.

I. For General Reading and Composition work:

- 1899—Pope's Translation of the Iliad (Books I., VI., XXII., and XXIV.) The Sir Roger de Coverley Papers, Goldsmith's Vicar of Wakefield, De Quincey's Flight of a Tartar Tribe, Cooper's Last of the Mohicans, Lowell's Vision of Sir Launfal, Hawthorne's House of the Seven Gables.
 1900—Pope's Translation of the Iliad (Books I., VI., XXII., and XXIV.) The Sir Roger de Coverley Papers, Goldsmith's Vicar of Wakefield, Scott's Ivanhoe, De Quincey's Flight of a Tartar Tribe, Cooper's Last of the Mohicans, Tennyson's Princess, Lowell's Vision of Sir Launfal.
 1901—George Eliot's Silas Warner, Pope's Translation of the Iliad (Books I., VI., XXII., and XXIV.) The Sir Roger de Coverley Papers, Goldsmith's Vicar of Wakefield, Scott's Ivanhoe, Shakespeare's Merchant of Venice, Cooper's Last of the Mohicans, Tennyson's Princess, Coleridge's Rime of the Ancient Mariner.

1902—The same as for 1901.

2. For thorough study.

- 1899—Shakespeare's Macbeth, Milton's Paradise Lost (Books I. and II.), Carlyle's Essay on Burns, Burke on Conciliation with America.
 1900—Shakespeare's Macbeth, Milton's Paradise Lost (Books I. and II.), Burke on Conciliation with America, Macaulay's Essays on Milton and Addison.

1901—Shakespeare's Macbeth, Milton's L'Allegro, Il Penseroso, Comus, and Lycidas, Burke on Conciliation with America, Macaulay's Essays on Milton and Addison.

1902—Shakespeare's Macbeth, Milton's L'Allegro, Il Penseroso, Comus, and Lycidas, Burke on Conciliation with America, Macaulay's Essays on Milton and Addison.

- h. **English Grammar.** There is included in the requirement for entrance a knowledge of the leading facts of English Grammar, and tests of such knowledge will be made a part of the examination.

GROUP II. *Requirements for Admission to the Ancient Classical Course.*

- a. The studies enumerated in Group I.
- b. **Latin:** Grammar and Elementary Book (Collar and Daniell, Tuell and Fowler, Harkness); Caesar, four books or an equivalent amount of Nepos, Caesar (at least two books) and selections; Cicero, seven orations (selections from the letters as given, for example, in Kelsey's edition, may be substituted for two orations); Virgil, six books; Composition (preferably in connection with Caesar and Cicero, as for example in Daniell's Exercises in Latin Composition).
- c. **Greek:** Grammar; Lessons: Xenophon's Anabasis four books; Homer's Iliad, three books or an equivalent amount of the Odyssey; Greek composition.
- d. **Ancient History:** Myers' and Allen's Ancient History; Myers' Ancient History or a substantial equivalent.
- e. **English History:** Gardiner's English History for Schools, or Montgomery's Leading Facts of English History.

Students prepared to enter the Modern Classical Course may be admitted as freshmen to the Ancient Classical Course and graduate with the degree of Bachelor of Arts on the following conditions: They shall take elementary Greek five times per week during the Freshman year; continue Greek four times a week during Sophomore and Junior years and complete all the other requirements of the Ancient Classical Course.

GROUP III. *Requirements for Admission to the Modern Classical Course.*

- a. The studies enumerated in Group I.
- b. **Latin** as stated in Group II., b.
- c. **History** as stated in Group II., d., e.

- d. **German:** Correct pronunciation; thorough drill in grammar including translations from German into English and from English into German (two terms); grammar combined with at least fifty lessons of any standard reader (three terms); prose readings (one term). In connection with the reading lessons, practice in the oral and written use of German, and memorizing of at least ten selected poems. For prose readings are recommended: Volkmann's *Kleine Geschichten*, Storm's *Immensee*, Heyse's *L'Arrabbiata*, Hillern's *Höher als die Kirche* or Wildenbruch's *Der Letzte*.

GROUP IV. *Requirements for Admission to the Civic Historical Course.*

- a. The studies enumerated in Group I.
- b. Latin as stated in Group II., b.
- c. **History** as stated in Group II., d., e.
- d. One of the following:
 1. German as stated in Group III., d., or
 2. Science as stated in Group V., c., d., e.; or
 3. English literature as stated in Group VI., c.; and physics as stated in Group V., c.

GROUP V. *Requirements for Admission to the General Science Course, to all the Courses in Engineering, and to the Four Year's Pharmacy Course.*

- a. The studies named in Group I.
- b. **German** as stated in Group III., d., or an equivalent amount of French.
- c. **Physics:** Carhart and Chute, Gage, or Avery, with laboratory work.
- d. **Physiology:** Martin's *The Human Body* (briefer course), or an equivalent.
- e. **Botany:** Two terms' study required, of which at least 60 hours shall be laboratory work devoted to the anatomy and physiology of plants. It is urged that part of this time be given to a study of cryptogams. For entrance in 1898-99 and thereafter a knowledge of the main groups of cryptogams will be required.
- f. **Adaptive Work**, amounting to one daily recitation for two years.

This may consist of various subjects. The University advises:

1. Two years' daily work in French or Latin; or,

2. One year's work in history, equivalent to that stated in Group II., d., e., and

One year's work in English literature, as stated in Group VI., c.

If these studies cannot be taken, a selection from the following studies may be offered:

3. Rhetoric, civil government, mental science, theory and art of teaching, zoology, astronomy, or other science. No subject can be offered which has been pursued in high school for a shorter time than twelve weeks, or which is less in amount than a standard high school text-book on the subject. The total amount offered must be equivalent of a daily recitation for two years. The two years' work may be made up of these studies in any combinations, under the conditions stated above.

GROUP VI. *Requirements for Admission to the English Course.*

- a. The studies named in Group I.
- b. **History** as prescribed in Group II., d., e.
- c. **English Literature:** A brief outline of the History of the English Literature. Careful study of representative writers. For the outline history there may be substituted a study of Gayley's *Classic Myths in English Literature*. The whole to be equal to a daily recitation for one year.
- d. **Science** as prescribed in Group V., c., d., e.
- e. **Adaptive Work** as stated in Group V., f.

Students entering this course are advised to present either Latin, French, or German as their adaptive work. Candidates not presenting any foreign language are urged to make a thorough review of English grammar. Experience has shown that a not inconsiderable number of students fail in French and German at the University from deficient preparation in English grammar.

Real equivalents will be accepted for the requirements given above. Students desiring admission into any course must present those requirements which are essential to the work of the course.

Admission of Special Students.

Candidates under twenty-one years of age desiring to take special courses are required to present the same qualifications as candidates for one of the regular courses.

Persons twenty-one years of age, who are not candidates for a degree, and who wish to take special studies, are permitted to do so upon giving satisfactory evidence that they are prepared to take the desired studies advantageously. If they subsequently desire to become candidates for a degree, or to take a regular course, they must pass the required entrance examinations.

II. Admission Upon Certificate.

Accredited Schools.—Any high school or academy whose course of instruction covers the branches requisite for admission to one or more of the courses of the University may be admitted to its accredited list of preparatory schools after a satisfactory examination by a committee of the Faculty. Application for such an examination may be made by an officer of the school to the President of the University, on the basis of which a committee of the Faculty will examine the course of study and the methods of instruction in the school, and on their favorable recommendation and the concurrence of the Faculty it will be entered upon the accredited list of the University. No school will be placed upon the list whose course of study is not fully equal to the four-year course of high schools recommended by the State Superintendent. The *graduates* of such an approved school will be received by the University, on presentation of a proper certificate, into any of its courses for which they have been fitted. Students of an accredited school who are not graduates must expect to be examined on the same terms as other candidates.

The University desires to keep itself fully informed regarding the work of its accredited schools by means of annual reports and frequent inspections. Every accredited school is required to report each year concerning its teachers, course of study, methods of instruction, and material equipment. Blank forms are furnished by the University for this purpose. Where the teaching force of a school remains unchanged, reinspection must be invited once in three years, or more frequently if the University is not satisfied with the condition of the school or the results of its work. Upon a change in the instructional force, application should be made for reinspection if the school desires to remain on the accredited list. If the work of the new teacher or teachers has been recently examined in connection with some other school, a new examination may not be required, but an ex-

amination should in all cases be invited. The necessary expenses attending the visit of the examining committee are met by the University.

Principals of accredited schools are requested to note the statements regarding English, German, Latin, and adaptive work under Terms of Admission; and especial attention is called to the examination of freshmen in English as stated on p. 60.

ACCREDITED SCHOOLS.

For All Courses.

SCHOOL.	PRINCIPAL.
Ashland,	J. T. HOOPER.
Austin (Ill.)	B. F. BUCK.
Beaver Dam : Wayland Academy,	H. J. VOSBURGH.
Beloit,	F. E. CONVERSE.
Cedar Rapids (Ia.)	MISS A. S. ABBOTT.
Chicago High Schools,	A. G. LANE.
Chicago: Harvard School,	{ J. J. SCHOBINGER. J. C. GRANT.
Council Bluffs (Ia.)	W. N. CLIFFORD.
Davenport (Ia.),	H. H. ROBERTS.
Delafield: St. John's Military Academy	REV. S. T. SMYTHE.
Des Moines (Ia.); West,	W. O. RIDDELL.
Detroit (Mich.): School for Boys,	
Dubuque (Ia.),	F. H. SMART.
Evanston (Ill.): Evanston Township,	H. L. BOLTWOOD.
Evansville,	H. F. KLING.
Faribault (Minn.): Shattuck School,	JAMES DOBBIN.
Fond du Lac,	L. A. WILLIAMS.
Fond du Lac: Grafton Hall,	B. TALBOT ROGERS.
Hillside Home School,	{ ELLEN C. LLOYD-JONES. JANE LLOYD-JONES.
Janesville,	D. D. MAYNE.
Kenosha,	E. C. WISWALL.
La Crosse,	W. R. HEMMENWAY.
La Grange (Ill.): Lyons Township,	E. G. COOLEY.
Lake Forest (Ill.): Lake Forest Academy,	A. G. WELCH.
Madison,	J. H. HUTCHISON.
Madison: Wisconsin Academy,	CARLOTTE RICHMOND.
Marinette,	C. J. BARR.
Milwaukee: East Side,	A. J. ROGERS.

SCHOOL.	PRINCIPAL.
Milwaukee: South Side,	S. A. HOOPER.
Milwaukee: West Side,	C. E. McLENEGAN.
Milwaukee Academy,	JULIUS H. PRATT, JR.
Milwaukee-Downer Col.; Seminary Dep't.,	MISS E. C. SABIN.
Monroe,	A. F. ROTE.
Oak Park (Ill.),	J. C. HANNA.
Omaha (Nebr.),	IRWEN LEVISTON.
Orchard Lake (Mich.): Mich. Mil. Academy,	C. A. SMITH.
Racine College,	H. D. ROBINSON.
Rockford (Ill.),	B. D. PARKER.
Sheboygan,	J. E. RIORDAN.
Sioux City (Ia.),	W. H. TRUMBULL.
Tomah,	E. H. CASSELS.
Waukesha: Carroll College,	W. L. RANKIN.
Wauwatosa,	E. C. CORNELIUS.
Winona (Minn.),	W. A. BARTLETT.

For Ancient Classical, Modern Classical, and Civic Historical Courses.

Rochester: Rochester Academy, . . . C. H. FARNAM.

For Modern Classical, Civic Historical, General Science, English, Engineering, Four Years' Pharmacy, and Agricultural Courses.

SCHOOL.	PRINCIPAL.
Appleton: Ryan High School,	R. W. PRINGLE.
Aurora (Ill.): East,	W. J. PRINGLE.
Aurora (Ill.): West,	A. V. GREENMAN.
Baraboo,	J. E. NECOLLINS.
Bayfield,	A. W. McCULLOCH.
Beaver Dam,	H. B. HUBBELL.
Berlin,	F. A. LOWELL.
Boscobel,	G. W. GEHRAND.
Brodhead,	H. C. BUELL.
Burlington,	J. M. TURNER.
Burlington (Ia.),	E. POPPE.
Chicago: Kenwood Institute,	ANNA E. BUTTS.
Chippewa Falls,	R. L. BARTON.
Clinton,	R. E. LOVELAND.
Columbus,	M. H. JACKSON.

SCHOOL.	PRINCIPAL.
Darlington,	J. M. STEVENS.
Decorah (Ia.),	E. A. PARKS.
Delavan,	C. W. RITTENBURG.
De Pere,	MISS V. M. ALDEN.
Des Moines (Ia.): North,	
Dodgeville,	DE WITT ELWOOD.
Eau Claire,	M. S. FRAWLEY.
Edgerton,	C. D. ROSA.
Elkhorn,	C. D. KIPP.
Fort Atkinson,	A. W. WEBER.
Freeport (Ill.),	S. E. RAINES.
Green Bay: East Side,	W. O. BROWN.
Green Bay: West Side,	A. W. BURTON.
Hudson,	S. B. TOBEY.
Indianapolis (Ind.): Man. Train. H. School,	C. E. EMMERICH.
Ironwood (Mich.),	L. L. WRIGHT.
Ishpeming (Mich.),	MISS A. F. OLCOTT.
Jefferson,	W. J. HAMMILL.
Joliet (Ill.),	J. S. BROWN.
Kaukauna,	I. M. ALLEN.
Lake Geneva,	A. F. BARTLETT.
Lancaster,	L. L. CLARKE.
Manitowoc: First Ward,	W. H. LUEHR.
Manitowoc: North Side,	H. J. EVANS.
Marshalltown (Ia.),	C. C. CARSTENS.
Menominee,	J. E. HOYT.
Merrill,	ANNA E. ANDERSON.
Mineral Point,	A. R. JOLLEY.
Oconto,	R. L. COOLEY.
Oshkosh,	BUEL T. DAVIS.
Plymouth,	OTTO GAFFRON.
Prairie du Chien,	J. A. PRATT.
Racine,	A. N. OZIAS.
Richland Center,	A. E. BRAINERD.
Ripon,	A. W. TRESSLER.
River Falls,	J. W. T. AMES.
Sinsinawa: St. Clara's Academy,	DOMINICAN SISTERS.
Shullsburg,	E. L. HANCOCK.
Sterling (Ill.): Sterling Township,	O. L. MILLER.
Stevens Point,	H. A. SIMONDS.
Sparta,	F. E. DOTY.

SCHOOL.	PRINCIPAL.
Superior: Broadway,	J. S. GRIFFIN.
Superior: Nelson Dewey,	C. R. FRAZIER.
Watertown,	C. F. VIEBAHN.
Waukesha,	H. L. TERRY.
Waupaca,	J. L. THATCHER.
Waupun: South Ward.	G. F. LOOMIS.
Wausau,	C. C. PARLIN.
West De Pere,	J. D. CONLEY.
Whitewater,	H. A. WHIPPLE.

For Modern Classical, Civic Historical, General Science, Engineering, Four Year's Pharmacy, and Agricultural Courses.

Prescott,	R. B. MACLEAN.
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For Modern Classical, Civic Historical, English, and Agricultural Courses.

McGregor (Ia.),	F. N. WILLIAMS.
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For Civic Historical, General Science, English, Engineering, Four Year's Pharmacy and Agricultural Courses.

Mauston,	A. H. FLETCHER.
Portage,	W. G. CLOUGH.

For Civic Historical, English and Agricultural Courses.

Dixon (Ill.),	C. W. GROVES.
Oregon (Ill.),	W. J. SUTHERLAND.
Sandwich (Ill.),	W. W. WOODBURY.

For General Science, English, Engineering, Four Year's Pharmacy, and Agricultural Courses.

Antigo,	C. O. MARSH.
Appleton: Third Ward,	W. F. WINSEY.
Arcadia,	G. O. BANTING.
Augusta,	ALBERT HEDLER.
Black River Falls,	J. H. DERSE.
Centralia,	F. W. STARR.
Charles City (Ia.),	G. S. DICK.
Clintonville,	W. H. HICKOK.
Cumberland,	J. S. HAMILTON.
De Forest: Windsor Township,	E. C. MELAND.
Durand,	D. E. KISER.

SCHOOL.	PRINCIPAL.
East Troy,	D. R. JONES.
Fox Lake,	F. W. LUCAS.
Grand Rapids,	G. T. BLYND.
Lake Mills,	A. B. WEST.
Lodi,	J. LEIDENBERG.
Marshfield,	J. B. BORDEN.
Mason City (Ia.),	A. R. SALE.
Mayville,	M. A. BUSSEWITZ.
Mazomanie,	W. KITTLE.
Mondovi,	J. W. NESBIT.
Milton Junction,	J. T. HEALY.
Neenah,	O. J. SCHUSTER.
Neillsville,	L. W. WOOD.
New Lisbon,	C. M. FOX.
New Richmond,	J. CALLAHAN.
Oconomowoc,	C. R. CROSS.
Poynette,	M. E. BAKER.
Prairie du Sac,	J. F. BERGEN.
Reedsburg,	W. P. ROSEMAN.
Rhineland,	F. S. HYER.
Sauk City,	J. E. PHILLIPS.
Seymour,	R. H. SCHMIDT.
Sheboygan Falls,	F. F. SHOWERS.
Spring Green,	W. H. SCHULTZ.
Stoughton,	A. H. SHOLTZ.
Stoughton Academy,	K. A. KASBERG.
Sturgeon Bay,	E. E. BECKWITH.
Two Rivers,	E. E. CARR.
West Bend,	D. T. KEELEY.

**For General Science, Engineering, Four Years' Pharmacy,
and Agricultural Courses.**

Rice Lake,	E. C. McCLELLAND.
Shawano,	H. W. ROOD.

For English and Agricultural Courses.

Appleton: St. Mary's School,	SISTER M. CLEMENTINE.
Chippewa Falls: Notre Dame School,	SISTER M. F. XAVIER.
Elroy,	W. E. UTENDORFER.
Evansville Seminary,	A. L. WHITCOMB.
Hartford,	E. W. PRYOR.

SCHOOL.	PRINCIPAL.
Horicon,	
Juneau,	A. P. WEST.
Kewaunee,	M. McMAHON.
Medford,	F. W. THOMAS.
Necedah,	C. H. MAXSON.
New London,	TAYLOR FRYE.
Omro,	E. E. SHELDON.
Onalaska,	B. F. OLTMAN.
Oregon,	FRANKLIN GOULD.
Sharon,	G. M. SHELDON.
Sun Prairie,	JAMES MELVILLE.

GRADUATES OF THE STATE NORMAL SCHOOLS.

The certified standing of any student in the regular courses of the Normal schools of this State will be accepted for entrance to the University in place of an examination in the subjects covered by the certificate.

The University offers a course designed especially for Normal graduates and leading to the degree of Bachelor of Philosophy in Pedagogy.

This course includes advanced instruction in pedagogy and those studies in language and science, both required and elective, which will best fit the graduate of our Normal schools for the successful conduct of his chosen profession. Announcement of the details of this course will be found on page 80. To this course graduates of the Normal schools will be admitted with the rank of junior, on the presentation of their diplomas. Graduates of the Normal schools who desire admission to the other courses of the University will be admitted to such courses with the provisional grade of juniors. They will be required, however, to take two years of work of rank equivalent to that of juniors and seniors in the University and will be required to make good deficiencies in the work of the freshman and sophomore years. Full credit will be give for all work done in the Normal schools which is equivalent to that of the University courses.

STUDENTS FROM OTHER COLLEGES AND UNIVERSITIES.

Students from other institutions, who have pursued standard college courses equivalent to those of this University, will be admitted to a like standing upon the presentation of proper cer-

tificates of creditable standing and honorable dismissal. Students of other colleges of good standing who have not taken such standard courses, but who have studied one year in the college proper, may be admitted to the University as special students without examination, or, upon such an examination as may be necessary to determine their attainments, they may be admitted to any course or to any class for which they are found fitted. Students coming from other institutions are advised to bring authenticated records of their standing. In all cases certificates of standing and honorable dismissal are necessary, and the University reserves the right to test the value of class records by actual examination.

No person will be admitted to the University later than November 1st of the year in which he expects to graduate.

GRADUATE STUDENTS.

Graduates of this University and other colleges and universities of good standing are admitted to graduate courses without examination.

CHARGES AND FEES.

A list of charges and fees is given on pages 37-39.

THE GRADUATE DEPARTMENT.

For the full statement of the organization of the Graduate Department reference is made to the heading Department of Graduate Study, pages 50-56, and for the announcement of special courses for graduates see the statements made under the Department of Study on subsequent pages.

THE UNDERGRADUATE DEPARTMENTS.

REQUIREMENTS FOR GRADUATION.

The unit-hour is the standard for computing the amount of work required for graduation. This is equal to one hour of recitation or lecture per week per one semester. Two hours of laboratory work or two hours of regularly prescribed military drill or physical exercise in the gymnasium are credited as one unit-hour. Students are expected to take 15 hours per week in recitations, lectures, and laboratory work, making 30 unit-hours per year, and 120 for the course. In addition two hours per week (one unit-hour per semester) of gymnastics are required during the first two years, making a total of four unit-hours. The men are required to drill two hours per week during the first two years, giving a credit of four unit-hours. The total requirements for class-room work, military drill, and the gymnasium are, therefore, 128 unit-hours for the men and 124 for the women.

Students excused from drill or gymnastics are required either to make up the work before graduation, or if the excuse is based on permanent incapacity, to make good the requirement by work in other departments.

No student will be permitted to receive a credit toward graduation of more than eighteen unit-hours in one semester in regular studies except by permission of the Faculty obtained in advance.

GRADUATION IN LESS THAN FOUR YEARS—SUMMER SESSION.

The attention of students is called to the announcement of the Summer Session of the University, as given on subsequent pages of the catalogue. Work in the Summer Session will be credited in the same way as work in the regular session of the University, and by attendance at one session a total amount of credit may be acquired not exceeding six unit-hours.

Students who desire to graduate in three years in one of the regular four-year courses may do so by taking 18 hours of rec-

tations per week and by attending three Summer Sessions. Permission to take work to this amount will be given only to students whose standing in their studies is wholly satisfactory. No credit will be given for repetition in the Summer Session of studies taken in the regular session of the University, or for repeating in the University work done in the summer. Students will therefore need to select carefully their work for the summer with reference to the required and elective studies of the course in which they intend to graduate. The Summer Session offers exceptionally good opportunities for the preparation of senior thesis. Any student who expects to shorten his course by means of the Summer Session should consult his class officer in selecting his studies.

ADJUSTMENT OF UNDERGRADUATE AND LAW COURSES.

The courses of the College of Letters and Science and those of the College of Law have been so adjusted to each other that it is now possible for a student to graduate from both colleges of the University in six years. Students in the College of Letters and Science will be permitted to elect studies in the College of Law during the last two years of their course; the amount to be thus elected is not to exceed a total of six hours per week for one year. This privilege will not be extended to Normal graduates attempting to graduate in two years, nor to undergraduates of other colleges who enter this University with the rank of Seniors. Students who have completed this amount of work in the Law School will be admitted to the Middle Class of the College of Law on graduation from the College of Letters and Science, thus enabling them to complete the course for the Bachelor of Law in two additional years. Members of the College of Law will also be permitted to elect studies in the College of Letters and Science which are related to the studies of their professional course, and may receive credit for this work in their law course, to an amount not exceeding four hours per week for one year.

ENGLISH FOR GRADUATION.

Course 1 in English, as described on page 111, is required of all freshmen. Early in the first semester the freshmen will be examined in English composition. This examination will be a practical one. The student will be required to write an essay, or more than one, on a familiar theme, planning his work by

paragraphs and constructing both paragraphs and sentences in accordance with the simpler principles of composition. The stress will be laid on neatness of manuscript and the avoidance of errors in spelling, punctuation, and grammar. These are essentials. The examination is to ascertain the student's ability to put material with which he is familiar into clear, correct English, rather than his ability to recite rhetorical or grammatical rules. A student who fails in this examination will, for the present, be allowed to take English composition twice a week for one year as a preparatory study, and must take English 1 later in his course. Admission to course 1 is provisional. Students will be promptly dropped into the preparatory class if they are unable to carry the work.

On the completion of course 1, a provisional pass mark is given; if at any time, later in his course, a student is reported as deficient or careless in English composition he will be required to take additional work in that subject.

SENIOR THESIS.

All candidates for the baccalaureate degree are required to present a graduating thesis, the subject of which must be approved by the class officer and the professor at the head of the department under which the candidate is doing the work represented by the thesis. This approval, in writing, must be secured by the student and deposited with the registrar not later than the middle of October of his senior year. The thesis must represent some phase of the student's work during the later years of his course, and must have the character of a scholarly dissertation on the subject. The thesis must be typewritten on paper of good quality, 8x10 inches in size, and must be bound according to specifications furnished by the Librarian of the University.

Before the thesis is accepted, it must be approved by the instructor under whom the work has been done, and by the head of the department. If accepted, the thesis becomes the property of the University, and is deposited in the University library. Theses in the College of Letters and Science must be completed and deposited in the library by June 1st.

UNDERGRADUATE COURSES.

The University offers, in the College of Letters and Science, seven courses of study leading to the bachelor's degree: The *Ancient Classical Course*, leading to the degree of Bachelor of

Arts; the *Modern Classical*, the *English*, and the *Civic Historical* courses, leading to the degree of Bachelor of Letters; the *General Science* and *Pre-medical* courses, leading to the degree of Bachelor of Science; the course for *Normal graduates*, leading to the degree of Bachelor of Philosophy in Pedagogy.

In the *Ancient Classical* and the *Modern Classical* courses, languages, ancient and modern, are the central studies. In the *General Science* and *Pre-medical* courses, science occupies the leading place; in the *English Course*, the English language and literature; in the *Civic Historical Course*, history, economics, and political science are the main lines.

The Pre-medical Course is intended to give a broad and solid foundation for the professional medical course, together with collegiate culture. Students desiring a similar course of scientific study introductory to the practice of pharmacy are referred to the account of the Four Years' Course in Pharmacy on a subsequent page.

The attention of students is directed to the opportunity offered in each course for election during Sophomore year. Through this privilege students can elect courses which are antecedent to the major study of junior and senior years. Since it is necessary for students to elect their major study at the opening of junior year, it will be wise for sophomores to consult with their class officers regarding this study.

Students who desire to specialize in a department which regularly offers no sophomore study in the course that they have entered may avail themselves of this means of securing the special instruction which they desire. This arrangement may be employed, for example, by students in the General Science Course, who desire to study the history, English, or languages offered in the sophomore year of other courses and to continue the studies of the selected department during junior and senior years. Similar combinations can be made by students in other courses.

GROUP STUDENTS.

Students who desire to extend the prosecution of a major study beyond the amount which would naturally come in the courses as described, may be accepted as group students in any department at the opening of the sophomore year. In this case they may substitute studies assigned by the head of the department to the amount of five hours in the place of

studies required during sophomore year. In this manner, provision may be made for special study in those departments whose work does not ordinarily begin in sophomore year, such as philosophy, pedagogy, geology, astronomy, and bacteriology, and also for extending the courses in other departments.

Students who avail themselves of this privilege must complete before graduation at least 10 unit-hours of science and 24 unit-hours of language study in two languages besides English. The degree given will be that of the student's course with the name of the department in which the major study lies, but a student of the Ancient Classical Course will not receive the B. A. degree unless he completes the Latin and Greek of the sophomore year.

REQUIREMENTS FOR THE JUNIOR AND SENIOR YEARS.

In all courses the requirements for the two upper years are alike and are as follows:

Junior and Senior Years: The student must elect a major study from one department to the amount of five hours per week for two years. This amount, however, may include the senior thesis, for which a credit of two hours per week is given during senior year. All required studies which have been postponed from sophomore year must be completed and courses must be elected sufficient to complete 120 unit-hours of class and laboratory work, besides the required drill and gymnastics.

The major study may be elected by a student from any course or from any department which he is prepared to enter—in a language, or science, in philosophy, or history, etc. If the major is selected from the departments of ancient languages a smaller amount is permitted in consideration of the large amount of time devoted to these subjects in freshman and sophomore years. The total amount need be only five hours for one year, besides the thesis, in Greek and Latin or in both languages together.

REQUIREMENTS FOR THE DEGREE OF BACHELOR OF ARTS.

Ancient Classical Course.

Freshman Year: Greek 5*; Latin 4; mathematics 3; English 3; military drill 2; gymnastics 2; 34 unit-hours for the year, of which 30 are in class room.

*The figures denote the number of recitations per week.

Sophomore Year: Greek 3; Latin 3; modern language 4; science 5; history 2 or 3; elective 2-5; military drill 2; gymnastics 2; 34 unit-hours required for the year, of which 30 are in class room and laboratory.

During the Sophomore year the student must take military drill and gymnastics and must elect two of the three languages offered. From the remainder of the list he must choose enough to make a total of 15 hours per week in regular class exercises, completing in junior and senior years studies postponed from sophomore year.

Junior and Senior Years: See p. 77.

REQUIREMENTS FOR THE DEGREE OF BACHELOR OF LETTERS.

1. Modern Classical Course.

Freshman Year: German 5*; Latin 4; mathematics 3; English 3; military drill 2; gymnastics 2; 34 unit-hours for the year, of which 30 are in class exercises.

Sophomore Year: German 3; Latin 3; French 4; science 5; history 2 or 3; elective 2-5; military drill 2; gymnastics 2; 34 unit-hours for the year, of which 30 are in class room and laboratory.

During the sophomore year a student must take military drill and gymnastics and must take two of the three languages offered. From the remainder of the list he must choose enough to make a total of 15 hours per week in regular class exercises, completing in junior and senior years studies postponed from sophomore year.

Junior and Senior Years: See p. 77.

2. Civic Historical Course (School of Economics, Political Science, and History.)

Freshman Year: Latin or German 4*; mathematics 3; history 5; English 3; military drill 2; gymnastics 2; 34 unit-hours for the year, of which 30 are in class exercises.

Sophomore Year: German 4 (if not taken in freshman year); French 4; history 3; economics and political science 3; science

*The figures denote the number of recitations per week.

5; elective 3-5; military drill 2; gymnastics 2; 34 unit-hours, of which 30 are in class room and laboratory.

During the sophomore year the student must take military drill and gymnastics, and from the remainder he must elect enough to make a total of 15 hours per week in regular class exercises, completing in junior and senior years studies postponed from sophomore year.

Junior and Senior Years: See p. 77.

3. English Course

Freshman Year: German 4*; mathematics 3; history 5; English 3; military drill 2; gymnastics 2; 34 unit-hours for the year, of which 30 are in class exercises.

Sophomore Year: Required study, German 4; Foreign language besides German 4; science 5; Anglo-Saxon 3; English literature 5; elective 3-5; military drill 2; gymnastics 2.

The student must take military drill and gymnastics and elect 11 hours from the work enumerated above, completing in junior and senior years studies postponed from sophomore year.

Junior and Senior Years: See p. 77.

REQUIREMENTS FOR THE DEGREE OF BACHELOR OF SCIENCE.

1. General Science Course.

Freshman Year: Biology 5*; German 4; mathematics 3; English 3; military drill 2; gymnastics 2; 34 unit-hours for the year, 30 of which are in class exercises.

Sophomore Year: German 3; French 4; physics 5; chemistry 5; elective 3-5; military drill 2; gymnastics 2; 34 unit-hours for the year, of which 30 are in class room and laboratory.

During the sophomore year the student must take military drill and gymnastics and elect 15 hours per week in regular class exercises, completing in junior and senior years studies postponed from sophomore year.

Junior and Senior Years: See p. 77.

*The figures denote the number of recitations per week.

2. Pre-Medical Course.

The required studies of the four-years' Pre-medical Course, leading to the degree of Bachelor of Science, are the same as those of the General Science Course. The students in the Pre-medical Course are required to turn their scientific work and their elections in the direction of those sciences which are preliminary to the study of medicine.

3. Engineering and Agricultural Courses and Four-Years' Pharmacy Course.

For details of these courses, look under College of Engineering, College of Agriculture, and School of Pharmacy, on later pages.

REQUIREMENTS FOR THE DEGREE OF BACHELOR OF PHILOSOPHY IN PEDAGOGY.

Course for Normal Graduates.

Graduates of the advanced courses of the State Normal schools are admitted to advanced standing in the various courses of the University on conditions which may be found on page 71 of this catalogue. The following special course for normal graduates has been arranged, leading in two years to the degree of Bachelor of Philosophy in Pedagogy. The course contains a minimum required amount of advanced studies in philosophy and pedagogy, with opportunity for further elections in those subjects. It requires also a continuous study of foreign language during the two years of the course. In other directions the student may elect his studies. It is expected that the normal graduate will give especial attention to fitting himself for teaching in one or two of the main lines of instruction, and the requirements and electives have been so arranged as to permit him to attain this end. He may devote himself especially to science, to literature, to history, or to any practical combination of these studies. He will be required, however, to make one of these lines of study his major work, and will not be permitted to elect a large number of short, scattered courses of instruction, since it is the especial design of this course to enlarge and complete his knowledge in certain definite directions.

The attention of the student is called to the necessity of

directing his work from the first to the preparation of a satisfactory graduation thesis. In most cases the thesis will probably be written on some topic suggested by pedagogy or philosophy. However, the student may arrange for his thesis in any other department, but in such case it will be necessary for him to plan his course from the beginning, so as to satisfy the requirements for a thesis.

Junior Year: Latin, French or German 4*; philosophy 3; advanced pedagogy 3; language, history, English, advanced mathematics, or science 5; electives 3 to 5; 18 hours per week required.

Senior Year: Continuation of Latin, French, or German 4; philosophy and advanced pedagogy 5; electives from language, science, history, economics, mathematics, or English 7; thesis 2; 18 hours per week required.

DEPARTMENTS OF INSTRUCTION.

Part of the courses of instruction described on the following pages are elementary courses for undergraduates, others are advanced courses for undergraduates and graduates, while still others in each department are designed especially for graduates.

PHILOSOPHY.

PROFESSOR STEARNS, PROFESSOR JASTROW,* ASSISTANT PROFESSOR SHARP,
DR. SOLOMONS, MR. LANE.

Students who contemplate devoting special attention to philosophy may begin the subject in the sophomore or in the junior year. The courses best adapted to serve as introductory are: 1, 2, 3, 9, 14, 15, 18, and 19. Students may begin the work with any one of these.

Special seminaries will be formed to meet the needs of graduate students and of undergraduates who are specializing in philosophy.

1. General Psychology. James' Outlines of Psychology, lectures, and readings. *First semester; M., W., F., at 9 and 3.* Assistant Professor SHARP.
2. Psychology of the Senses and Nervous System. *First semester; lectures, reading, etc. Tu., Th., at 9 and 3.* Dr. SOLOMONS.
3. Psychology and General Introduction to Philosophy. This course is intended especially for sophomores, and others desirous of gaining a view of the problems of Philosophy preparatory to further work in this field. *Second semester; Tu., Th., and S., at 9.* Assistant Professor SHARP.

*In the absence of Professor Jastrow in Europe for 1898-99, Dr. Solomons has temporarily had charge of his work.

4. Experimental Psychology. (a) Lectures and demonstrations covering in a fairly comprehensive and practical manner the field of experimental psychology. *Second semester; M., W., F., at 9.* (b) Laboratory practice course parallel with the lectures. The hours for laboratory work will be arranged by consultation. (a) and (b) together count as a full study. *Second semester; four hours weekly.* Dr. SOLOMONS.
5. Research in Psychology. Special themes are experimentally treated and the appropriate literature critically reviewed under personal supervision. *Throughout the year; hours to be arranged by consultation.* Professor JASTROW.
6. Comparative Psychology. Lectures and assigned readings, covering the more important topics in animal psychology and the development of the child and of the race. *Second semester; Tu., Th., at 10.* Given in 1898-99. Dr. SOLOMONS.
7. Abnormal Psychology. Lectures upon illusions, dreams, hypnotism, insanity, idiocy, deaf-mutism, blindness, diseases of speech, of will, of the emotions, psychic epidemics, and allied topics. Given in 1899-1900. *Second semester; Tu., Th., at 9.* Professor JASTROW.
8. Advanced Analytical Psychology. *Second semester; twice a week.* Assistant Professor SHARP.
9. History of Greek Philosophy; *First semester; M., W., F., at 10.* Professor STEARNS.
10. History of Modern Philosophy. *Second semester; M., W., F., at 10.* Mr. LANE.
11. Introduction to Modern Philosophy. *Second semester; three times a week at 8.* Professor STEARNS.
12. The Philosophy of Modern Science. Discussion of some of the problems in the philosophy of nature. *First semester; Tu., Th., at 8.* Professor STEARNS.
13. The Theory of Cognition. An outline study of Descartes, Locke, and Berkeley. Hume's Treatise on Human Nature, Book I; Kant's Critique of Pure Reason; Modern Theories. Course 9 or 10 will be required preparatory to this course, except as special arrangements are made with the instructor. *Throughout the year; M., W., F., at 8.* Assistant Professor SHARP.

14. Systematic Ethics. Mackenzie's Manual of Ethics. *Second semester; M., W., F., at 9.* Assistant Professor SHARP.
15. Problems in Applied Ethics. Course 14 is not required as a preliminary. *Second semester; Tu., Th., at 8.* Assistant Professor SHARP.
16. Advanced Systematic Ethics. Open only to students who have taken course 14. *First semester; Tu., Th., S., at 8.* Assistant Professor SHARP.
17. Aesthetics. (a) Philosophy of Art and Art Criticism. *First semester; Tu., Th., at 8.* (b) History of Art. *Second semester; M., W., F., at 9.* Professor STEARNS.
18. Deductive Logic. An elementary course in which Fowler's Logic is used as a text-book, but is considerably supplemented by lectures and discussions, introducing the more recent modes of treating the problems of logic. *First semester; M., W., F., at 10.* Dr. SOLOMONS.
19. Inductive Logic. An elementary course covering the ground of Fowler's Logic, supplemented by discussions on the logic of probabilities, scientific methods, and fallacies. *Second semester; Tu., Th., at 10.* Dr. SOLOMONS.

PEDAGOGY.

PROFESSOR STEARNS, PROFESSOR O'SHEA, AND MR. LANE.

I. History and Philosophy of Education.

1. History of Educational Theories and Institutions, Greek, Roman and Modern, lectures, readings and essays. Special attention will be given to the development of modern educational thought. *First semester; M., W., F., at 9.* Professor STEARNS.
2. Modern Educational Systems. A comparative study of education in England, France and Germany, for graduate students. *First semester; twice a week at 8.* Professor STEARNS.
3. The Herbartian Pedagogy. Herbart's Science of Education; Rein's Pedagogics; Lange's Apperception. *Second semester; twice a week at 8.* Professor STEARNS.
4. School Supervision. The making and administration of courses of study; examination; promotions; inspections, etc. *First semester; Tu., Th., at 8.* Professor STEARNS.

Courses 3 and 4 are given in alternate years; course 4 will be given in 1899-1900.

5. The Philosophy of Education. Lectures, readings, and discussions on the nature, forms, and elements of education. *Tu., Th., at 10.* Professor STEARNS.
6. Methods and Management in Grammar and High School Grades. *Second semester; Tu., Th., at 9.* Professor STEARNS.
7. Seminary in Pedagogy, for the discussion of current educational problems. Open to those who have done one year's work in pedagogy. *Once a week throughout the year.* Professor STEARNS.

II. Mental Development.

Data will be gathered from the fields of child-study, anthropology, biology, evolution, etc., and interpreted in the light of their bearings upon education in all its phases. The hygiene and economy of mental growth and activity will have a prominent place throughout. The work will be suited to the needs of students, whether intending to teach or not. It will be offered in four courses.

8. The evolutionary view of the development of the mind. Adolescence; Modes of expression; Mental fatigue; Fear; bullying and teasing; games and plays, etc. *First semester; M., W., F., at 9.* Professor O'SHEA.
9. The work of this course will be of a similar nature to that of course 8. The problems of suggestion, imitation, invention, and individual psychology will be especially emphasized. *Second semester; M., W., F., at 9.* Professor O'SHEA.
10. Advanced Mental Development. Designed for students doing special work in education, philosophy, or psychology. It will be the aim to trace the genesis of the intellectual faculties in the individual and in the race in the attempt to reach fundamental principles of psychic activity. *First semester; Tu., Th., at 4.* Professor O'SHEA.
11. Advanced Mental Development. Continuation of course 10. It will be the aim to trace the genesis of the ethical and social emotions in the individual and in the race. *Second semester; Tu., Th., at 4.* Professor O'SHEA.

III. Principles of Education.

This work will be based upon the views of modern biological, rational, and experimental psychology, so far as these relate to the determination of school studies and methods, and will be of immediate theoretical and practical value to those desiring to teach. It will be offered in four courses:

12. Mental habit, and the method of teaching the language arts and mathematics. Also, apperception and the method of teaching history, science, etc. *First semester; M., W., F., at 10.* Professor O'SHEA.
13. The training of the emotions and the will,—influence of studies, methods, personality, and discipline. The purpose of education and the making of a curriculum. *Second semester; M., W., F., at 10.* Professor O'SHEA.
14. Educational psychology and methods of teaching. A general survey of the principles of educational psychology and their application to the making of a curriculum and the methods of teaching in the high school. *Second semester; M., W., F., at 12.* Professor O'SHEA.
15. Educational Classics. Readings from the works of great writers, ancient and modern, to ascertain their views upon education in respect alike of studies and methods. Readings will be made in Aristotle, Plato, Dickens, George Eliot, and others. *First semester; Tu., Th., at 12.*

IV. Art of Teaching and School Management.

16. Observation of teaching in the grammar grades and high school, with discussions. Designed as a practical course for those desiring to teach in or become principals of high schools, or supervising principals. The problems of actual teaching and management will be observed concretely and critically considered. *Second semester, three hours a week.* Hours to be arranged to suit students. Professor O'SHEA.

ECONOMICS AND STATISTICS.

PROFESSOR ELY, PROFESSOR SCOTT, DR. JONES, DR. MEYER, AND MR. TAYLOR.

Elementary Courses.

1. Economic History. A course in the economic history of England. Textbook: Gibbins' *Industry in England*.

Required of freshmen in the Civic Historic and English courses, and of all students who are beginning the subject of economics. *Repeated each semester, and given in connection with Course 2 in History. Tu., Th., at 8 and 9 first semester, and 2 and 3 second semester.* Professor SCOTT.

2. The Elements of Economic Science. Textbook: Ely's Outlines of Economics (college edition). *Repeated each semester; Tu., Th., S., at 8 and 9.* Dr. JONES.
3. Money and Banking. Nicholson's Money and Monetary Problems, Laughlin's History of Bimetallism in the United States, and Dunbar's History and Theory of Banking. *First semester; M., W., F., at 8.* Professor SCOTT.
4. Economic Problems. A study of socialism. Text-book: Ely's Socialism and Social Reform. Lectures and class reports on such topics as economic crises, co-operation, profit-sharing, railroad problems, etc. *Second semester; M., W., F., at 9.* Dr. JONES.
5. The Economics of Agriculture. This course is designed primarily for the students of the College of Agriculture, though any student may be admitted. Lectures followed by class discussion. *Two hours per week from January 1st to April 1st.* Professor SCOTT.
6. Senior Seminary. The Seniors who write theses on economic topics meet in this Seminary for the presentation and discussion of reports on their respective topics. *Second semester; alternate weeks on Wednesday evenings at 7.* Professor SCOTT.
7. Economic Geography. Courses for graduates and undergraduates. The course will follow the outlines of the subject laid down by Ritter, and will include a discussion of the character of commercial relations, localization of industry, and such other peculiarities of the economic life of the chief European nations and the United States as can be traced to the influence of the physical environment. *First semester; Tu., Th., at 10.* Dr. JONES.
8. Statistics. The statistical method, considered as an aid in economic research. *Second semester; M., W., F., at 10.* Dr. JONES.

9. The Classical Economists. Adam Smith, Ricardo, and J. S. Mill. Study of characteristic parts of the works of these authors with lectures and class discussions. *Second semester; M., W., F., at 8.* Professor SCOTT.
10. Railway Transportation. This course is historical, economic, and legal. Lectures and assigned readings. *Second semester, M., W., at 2.* Dr. MEYER.
11. Insurance. A series of lectures on the history, principles, and organization of insurance. *First semester; Tu., at 5.* Dr. MEYER.
12. The Economic Functions of the State. This course consists of a series of lectures, historical and critical, on the state in its relation to industry, trade, and the professions, with special reference to pharmacy. *First semester.* Dr. MEYER. (Not given in 1899-1900).
13. History of Economic Thought. For undergraduates who have had courses 1 and 2, and for graduates who have not had a course in the history of economic thought. *Second semester; M., W., at 3.* Professor ELY.

Graduate Courses.

14. The Distribution of Wealth. Part I. This course deals chiefly with the fundamental institutions in the existing social order and their relation to the present distribution of wealth. *Throughout the year; Tu., W., Th., at 3.* Open to graduate students and undergraduates who have had suitable preparation. Professor ELY. (Not given in 1899-1900).
15. Distribution of Wealth. Part II. A discussion of the separate factors in distribution, such as rent, interest and wages, and monopoly gains; the equilibrium of the factors in distribution; individual fortunes and differential gains; modifications in the distribution of wealth, actual and proposed, including a discussion of socialism; the distribution of wealth and social progress. *Throughout the year; Tu., W., Th., at 3.* May be taken by those who have not had Part I, Course 14. Professor ELY.
16. Theories of Value. A critical study of value theories. Each student is expected to study carefully the writings of the theorists examined. *First semester; Tu., Th., at 12.* Professor SCOTT.

17. Theories of Rent, Wages, Profits, and Interest. *Throughout the year; Tu., Th., at 12.* Professor SCOTT. (Not given in 1899-1900.)
18. Theories of Production and Consumption. Theories of social prosperity, of population, and of capital, and the theories which concern the operation of physical forces, and the influence of the consumption of wealth on production and distribution. *Second semester; Tu., Th., at 12.* Professor SCOTT.
19. Public Finance. A discussion of the revenues and expenditures of government. Open to graduates and advanced students. *Throughout the year; Tu., W., Th., at 4.* Professor ELY.
20. American Public Finance. Part I. A critical and historical discussion of the finances of the Federal government. *First semester; Tu., W., Th., at 4.* Professor ELY. (Not given in 1899-1900.)
21. American Public Finance. Part II. The finances of the American commonwealths, and local political units. Open to graduates and advanced students. *Second semester; Tu., W., Th., at 4.* Professor ELY. (Not given in 1899-1900.)
22. Economic Seminary. This is designed primarily for advanced students who wish to carry on special investigations under the guidance which the department affords. The subject for 1899-1900 is: The Physiocrats and their predecessors in France.

A subordinate feature of the seminary work is the review of recent books and important articles published in the periodicals. *Tuesday evenings throughout the year from 8 to 10.* Professor ELY, Professor SCOTT, Dr. JONES, and Dr. MEYER.

Arrangement of Courses.

The courses in the department of economics and statistics are divided into three groups. Courses 1 to 6 inclusive are designed to give a general survey of the field and are regarded as undergraduate courses. Candidates for advanced degrees whose previous preparation has been deficient may be required to take one

or more of these courses, but they do not receive any graduate credits for so doing.

Courses 7 to 13 inclusive are advanced courses to which both graduates and undergraduates are admitted.

Courses 14 to 22 inclusive are graduate courses and are designed only for graduate students. By special permission others of suitable preparation and ripeness may be admitted to these courses.

SOCIOLOGY.

PROFESSOR ELY, DR. MEYER, ASSISTANT PROFESSOR SHARP, AND DR. JONES.

1. The Elements of Sociology. In this course an attempt is made to familiarize the student with those notions which will enable him to read sociological literature with discrimination. Lectures and assigned readings. *First semester; M., Tu., W., at 10.* Dr. MEYER.
2. Modern Sociological Thought. The leading characteristics of the works of sociological writers from Comte to the present time. *Second semester; M., Tu., W., at 10.* Dr. MEYER.
3. The Psychological Sociologists. Special attention is paid to the works of Professor F. H. Giddings. *First semester; M., W., at 9.* Dr. MEYER.
4. American Charities and Crime. Text-books: Warner's American Charities and Wines' Punishment and Reformation. An important feature of this course consists in the lectures given by men and women who have devoted special attention to some phase of charitable and correctional work. The class will also make excursions to the more easily accessible state and local institutions for the purpose of practical study. *First semester; M., W., F., at 9.* Dr. JONES.
5. Field Work. Students are encouraged to study charitable and correctional institutions in Madison and vicinity and opportunity is afforded for continuous practical work during the summer months. During past years students from the University of Wisconsin, some of whom have been aided by scholarships, have engaged in field work under the direction of Dr. P. W. Ayers, of New York, for-

merly of Chicago. Several of these students have taken up work of this kind as a career. Chicago, Cincinnati, and other cities offer opportunities for field work. It is believed that this method of continuous study, followed by continuous field work, yields the best result. It is the aim of this department to furnish secretaries of charity organization societies and other trained workers. At present the demand for such workers is larger than the supply.

6. Social Ethics. The connection between ethics and economics and the ethics of economic relations. *First semester; twice a week. M., W., at 3.* Professor ELY. (Not given in 1899-1900.)
7. Social Ethics. *Second semester; Tu., Th., at 9.* Assistant Professor SHARP.
8. Seminary in Sociology. Designed particularly for graduate students, and others of suitable preparation. Professors ELY and SCOTT and Dr. JONES participate in several of the discussions. *Second semester; once a week.* Dr. MEYER.

POLITICAL SCIENCE.

PROFESSOR PARKINSON, DR. REINSCH, AND DR. SPARLING.

Elementary Courses.

1. Elements of Political Science. (a) An introductory course to general political science. (b) During the second semester this course will be made as far as possible a Teachers' Course in Civics. *Both semesters; M., W., F., at 8.* Dr. SPARLING.
2. Elementary Law. Designed to familiarize the student with its terminology and leading principles and their practical application to every day life. *Both semesters; Tu., Th., at 12.* Dr. REINSCH.
3. Elements of Administration. Introductory to the general field of administrative study. The theory of administration, and a survey of the administrative systems of the chief states of modern Europe, and of the South American republics. *First semester; Tu., Th., at 11.* Dr. SPARLING.

Advanced Courses.

4. Roman Law. *First semester.* History of the development of Roman Law from the Twelve Tables to the Corpus Juris of Justinian. *Second semester.* Institutes of Roman Law. The work of each semester may be elected separately. *Tu., Th., at 12.* Dr. REINSCH. (Not given in 1899-1900.)
5. Introduction to the History of European Law. Early Germanic law and its development in France and Germany. The reception of Roman law. The modern codes. Open to students of suitable preparation. *Second semester; Tu., Th., at 8.* Dr. REINSCH. (Not given in 1899-1900.)
6. History of English and American Law. The development of legal institutions as an expression of social and political progress. *First semester; M., W., F., at 12.* Dr. REINSCH.
7. Comparative Jurisprudence. The sources of the principal modern legal systems, followed by a comparative study of some of the leading institutions and principles of the French, German, Spanish, English, and American law. Open to students who have had an elementary course in law. *Second semester; M., W., at 12.* Dr. REINSCH.
8. Jurisprudence. Analysis of the main concepts of the science of law on the basis of the juristic classics. *Second semester; Tu., Th., at 8.* Dr. REINSCH.
9. History of Political Thought. *First semester;* The development of political philosophy from the Greeks to the beginning of the present century, and its connection with political history. *Second semester;* Recent political thought in Europe and America. Open to advanced students. *Throughout the year; M., W., F., at 11.* Dr. REINSCH.
10. Constitutional Law. A brief course of lectures upon the English constitution, to be followed by a study of the constitution of the United States. *Throughout the year; M., W., F., at 9.* Professor PARKINSON.
11. Constitutional Law. Designed to make a closer study of the more important parts of the Constitution. *Both semesters; Tu., Th., at 9.* Professor PARKINSON.

12. Constitutional Law. A comparative study of the more striking features of the constitutions of England, France, Germany, Switzerland, and the United States. Lectures, co-operative work, and class discussions. Open to graduates and other advanced students. *Second semester; M., W., F., at 9.* Professor PARKINSON. (Not given in 1899-1900.)
13. Municipal Government in Europe and the United States. *Second semester; M., W., F., at 11.* Dr. SPARLING.
14. State and Federal Administration. A course designed to outline the state and federal systems of administration, and the methods of conducting the business of government. May be elected separately, but should follow course 3, if possible. *Second semester; Tu., Th., at 11.* Dr. SPARLING.
15. Comparative Administrative Law. The scope of this course is essentially the same as covered in Vol. II., Goodnow's Comparative Administrative Law. This course has in view the needs of the legal profession. *First semester; Tu., Th., at 8.* Dr. SPARLING.
16. Seminary in Administration. The history of the central administration will be studied from the sources, supplemented with readings from secondary authorities. Open to graduates and seniors. *Both semesters, 2 hours. Hours and days to be determined later.* Dr. SPARLING.
17. International Law. The nature, sources, and sanctions of international law; its growth, improvement, and present status. *First semester; M., W., F., at 10.* Professor PARKINSON.
18. International Law. Designed to follow course 17, but may be taken independently. More attention will here be given to the subject of diplomacy, to the rights and obligations of neutrals, and to the methods of settling international disputes without resort to war. Open to graduates and other advanced students. *Second semesters; M., W., at 10.* Professor PARKINSON.
19. Seminary in Political Philosophy. For 1899-1900, the political philosophy of the 18th century. The development of the rationalistic theory of the state in its principal

exponents and critics in Europe and America. Open to graduate students. *Throughout the year; M., 4:30—6.* Dr. REINSCH.

20. Political Science Seminary. A two hour seminary in public law, administration, and comparative jurisprudence will be conducted fortnightly, during both semesters. Open to advanced students only. Professor PARKINSON, Dr. REINSCH, and Dr. SPARLING.

HISTORY.

PROFESSOR TURNER, PROFESSOR HASKINS, ASSISTANT PROFESSOR COFFIN,
DR. LIBBY, MR. WARD, AND MISS WATTS.

Introductory Courses.

1. Ancient History. A brief outline of Oriental history and a more particular study of the history of Greece and Rome. Professor HASKINS and Dr. LIBBY.
 - a. For freshmen in the Civic Historical Course. *First semester; M., Tu., W., Th., F., at 2 and 3.*
 - b. For freshmen in the English Course. *Second semester; M., Tu., W., Th., F., at 8, 9, and 12.*
 - c. With special reference to the needs of classical students. *Throughout the year; M., W., F., at 11.* Classical sophomores may satisfy the requirement in history by taking either this course, Course 2, or Course 5.
2. English History. The work is in two divisions:
 - a. Political History. *Repeated each semester; M., W., F., at 8 and 9.* Special attention is given to the formation and nature of the modern British Empire. Assistant Professor COFFIN, Mr. WARD, and Miss WATTS.
 - b. Economic History. See Course 1 in Economics for a description of this course. *Repeated each semester; Tu., Th., at 8 and 9.* Professor SCOTT.

Both divisions of the course are required of freshmen in the English Course (first semester) and of freshmen in the Civic Historical Course (second semester); they are open to election either together or separately by other students.
3. Mediaeval History. A general survey of the history of continental Europe from the barbarian invasions to the close of the fifteenth century. *First semester; M., W., F., at 11.*

Required of sophomores in the Civic Historical Course; open to all other students who have had Course 1. Professor HASKINS.

4. Modern European History. A general survey extending from the close of the fifteenth century to the present day. *Second semester; M., W., F., at 11.* Required of sophomores in the Civic Historical Course. Assistant Professor COFFIN.
5. American History. A general survey with emphasis on political history. The course may be elected by separate semesters; by additional reading and topical reports it may be made to count as a three-hour course.
 - a. To the close of the War of 1812. *First semester; Tu., Th., at 11.*
 - b. From the close of the War of 1812 to the present time. *Second semester; Tu., Th., at 11.* Professor TURNER.

Advanced Courses.

6. Europe during the later Middle Ages. Special study of the fourteenth and fifteenth centuries; in the second semester particular attention will be given to the civilization of Italy in the period of the Renaissance. *Throughout the year; Tu., Th., at 12.* Open to all students who have had course 3. Given in 1899-1900. Professor HASKINS.
7. Constitutional History of England. *Throughout the year; Tu., Th., at 12.* Open to juniors and seniors who have had course 2. Omitted in 1899-1900. Professor HASKINS.
8. The French Revolutionary and Napoleonic Periods, 1789-1814. An advanced course, alternating with course 9, and open to those who have had course 4, or its equivalent. *Throughout the year; Tu., Th., at 10.* Given in 1899-1900. Assistant Professor COFFIN.
9. History of Europe in the Nineteenth Century, 1815-1899. Alternating with course 8. *Throughout the year; Tu., Th., at 10.* Assistant Professor COFFIN.
10. American Sectionalism. A study of the geographical distribution of political parties with especial reference to votes in congress and in state legislatures. *Three times a week for the first semester.* Dr. LIBBY.

11. History of the West. Particular attention is paid to the advance of settlement across the continent, and to the results of this movement. The course should be preceded by course 5, or its equivalent. Given in 1898-99. *Throughout the year; M., W., F., at 12.* Professor TURNER.
12. Economic and Social History of the United States, to 1789. Must be preceded by course 5, or its equivalent. Given in 1897-98. *Throughout the year; M., W., F., at 12.* Professor TURNER.
13. Economic and Social History of the United States, 1789 to 1850. Must be preceded by course 5 or its equivalent. Given in 1899-1900. *Throughout the year; M., W., F., at 12.* Professor TURNER.
14. Greek and Roman Institutions. *Tu., Th., at 11.* Open to graduate students and seniors of suitable preparation. Given in 1900-1901. Professor HASKINS.
15. History of French Institutions. From the earliest period to the close of the seventeenth century. *Tu., Th., at 11, F., at 10.* Open to graduate students and seniors of suitable preparation. Given in 1899-1900. Professor HASKINS.
16. Methods of History Teaching, with special reference to the work of secondary schools. For juniors and seniors of suitable preparation. Omitted in 1899-1900. *Second semester; F., at 3.* Professors TURNER and HASKINS.

Graduate Courses.

17. Methods of Research and Criticism. *First semester; Historical bibliography. Second semester; Elements of historical criticism.* Omitted in 1899-1900. *W., at 10.* Professor HASKINS.
18. (a) Palaeography and Diplomatics. (a) Elements of palaeography, with practical exercises in the reading of manuscript facsimiles; (b) elementary exercises in diplomatics. The first part of the course is identical with the first part of Course 7b in Latin and is arranged for the benefit of advanced students of language as well as for students of history. Omitted in 1899-1900. *Second semester; F., 11 to 1.* Professor HASKINS.

19. Seminary in Mediaeval History. During the present year the work is devoted to problems in the history of England in the thirteenth and fourteenth centuries. In 1899-1900 certain topics in mediaeval French institutions will be taken up. *First Semester; W., 2 to 4.* Professor HASKINS.
20. Seminary in Modern European History. Intended for graduates and specially qualified seniors doing thesis work in this field. In 1899-1900 the work will be devoted to a careful examination of the *cahiers* of 1789. *Throughout the year; S., 11 to 1.* Assistant Professor COFFIN.
21. Seminary in American History. The constitutional and political history of the United States is studied from the sources, combined with lectures and required reading in secondary authorities. For 1898-99 the work was in the period 1763 to 1787. For 1899-1900 the seminary will study the era 1787 to 1820. *Throughout the year; Tu., Th., 4:15 to 5:30.* Professor TURNER.
22. Historical Conference. A fortnightly meeting of instructors and graduate students in the department for conference, consideration of papers, and criticism of current historical literature. *Fortnightly throughout the year; F., 4 to 6.*

Arrangement of Courses.

The courses in the Department of History are divided into three groups. Courses 1 to 5 are planned so as to afford an introductory survey of the general field of history. They cannot be counted toward advanced degrees, and graduates are required to have completed them, or a substantial equivalent, before entering on their graduate studies. Courses 6 to 15 are designed to continue the studies begun in the preliminary courses in the direction of greater specialization in the fields of ancient, mediaeval, and modern European history, English history, and American history. They are open to undergraduates of sufficient advancement, and are also suited to the early years of graduate study. The remaining courses—except course 16, which is a special course for those intending to teach history in secondary schools—are designed to afford training in original research in representative fields of history; they are open to advanced students under conditions which vary in the different courses.

GREEK.

PROFESSOR SMITH, PROFESSOR KERR, ASSISTANT PROFESSOR LAIRD, ASSISTANT PROFESSOR EMERY, AND MR. CLARK.

Elementary Courses.

1. *Elementary Greek.* White's Beginner's Greek Book, Xenophon's Anabasis, Homer's Odyssey I.—IV., Greek Composition. *Throughout the year; M., Tu., W., Th., F., at 12.* Assistant Professor LAIRD.
2. *First semester:* Lysias, Xenophon's Hellenics; Goodwin's Grammar. *M., W., Th., F., at 9.* Professor SMITH and Assistant Professor LAIRD.
Second semester: Selections from Homer and Herodotus. *M., Th., F., at 10.* Professor KERR and Assistant Professor EMERY.
 Greek Composition, *throughout the year; Tu., at 9.* Assistant Professor LAIRD. (Course 2 is required of Ancient Classical freshmen.)
3. *First semester:* The Philippics of Demosthenes, Euripides (two plays), Goodwin's Moods and Tenses. *M., Th., F., at 10.* Professor KERR.
Second semester: Plato's Apology and Crito, Thucydides VII., Jebb's Primer of Greek Literature. *M., Th., F., at 10.* Professor SMITH and Assistant Professor EMERY.
 Greek Composition, *throughout the year; Tu., at 10.* Professor SMITH. (Course 3 is required of Ancient Classical sophomores.)

Elective Courses.

4. Herodotus, one book, Xenophon's Memorabilia, or selected Dialogues of Lucian. *Throughout the year; M., F., at 11.* Assistant Professor LAIRD. (Course 4 is an elective for sophomores, but is open also to such freshmen as receive the permission of the instructor.)
5. *First semester:* Greek Lyric Poets, study of meters. *M., W., F., at 9.* Professor SMITH.
Second semester: Thucydides. *M., W., F., at 9.* Professor SMITH. (Open to juniors and seniors.)

6. Greek Dramatic Poets. *First semester*: Aeschylus (two plays), Sophocles (two plays), study of meters.
Second semester: Aristophanes, Aristotle's Poetics, discussion of the Greek Drama. *M., W., F., at 9.* Professor SMITH. (Open to juniors and seniors, omitted in 1899-1900.)
7. Greek Orators. *Tu., Th., at 9.* Assistant Professor LAIRD. (Open to juniors and seniors.)
8. Advanced Greek Composition. *First semester; Tu., at 9.* Professor SMITH or Assistant Professor LAIRD. (Open to juniors, seniors, and graduates.)
9. Plato. The Republic. Books I., II., and X. This course is intended as an introduction to the study of Greek philosophy. *Throughout the year; Tu., Th., at 9.* Professor KERR. (Open to juniors and seniors.)
10. Modern Greek Language and Literature. A study of the changes in form and structure which the language has undergone since the classical period. Readings from contemporary Greek authors, and a comparison of their writings with the prose and poetry of the Attic Greek. Papers and discussions upon topics connected with the course of reading. (Elective for juniors and seniors.) *Throughout the year; S., at 11.* Professor KERR.
11. Lectures on the life of the ancient Greeks, illustrated by means of lantern slides. Once a week, *throughout the year; W., at 5.* Professor SMITH. (A knowledge of Greek is not required for this course.)

Graduate Courses.

The object of the graduate courses in Greek is to secure, on the part of advanced students, graduates especially, wide reading in Greek authors, acquaintance with the latest results of philological investigation through constant reading of critical journals, the forming of habits and learning of methods of research. In pursuance of the last named purpose especially, the Greek Seminary meets to hear and to discuss carefully prepared papers, the members leading in turn. It is to be understood that the preparation for each lead will require the greater portion of a student's time for at least two weeks. The work will be occasionally varied and relieved by extempore exercises in read-

ing and writing Greek. The work of the Seminary will be supplemented by courses of lectures.

12. Thucydides, studied throughout the year, the whole of the author being read privately by the members of the class. Each member leads in turn, presenting a paper embodying a critical discussion of some passage of the text, or of some topic especially assigned. *Throughout the year, S., 9-11.* (Omitted in 1899-1900.) Professor SMITH.
13. Greek Antiquities, State and Private. One exercise a week, *throughout the year.* Professor SMITH.
14. Greek Drama. During the first semester several tragedies of Sophocles or of Euripides will be critically studied and interpreted, in the second semester certain comedies of Aristophanes, especial stress being laid upon the treatment of the dramas as literature. As supplementary to this course the Scenic antiquities will be studied, Haigh's Attic Theatre being used as a basis. *Throughout the year, S., 9-11.* Professor SMITH.
15. Lyric Poetry. Especial attention is given to Pindar and to Bacchylides. Wide reading in the fragments of the other lyric poets will also be required of the class. *Throughout the year, S., 9-11.* (Omitted in 1899-1900.) Professor SMITH.
16. Greek Dialects. A study of dialect sounds and forms based on the inscriptions. Cauer's *Delectus Inscriptionum Graecarum* will in the main be followed. The members of the class will lead in turn, and special problems for investigation will also be assigned. *Two hours a week for a portion of the year, as part of the regular Seminary work.* Assistant Professor LAIRD.
17. Journal Club. Reports on and discussions of current philological literature. *One hour a week throughout the year.* Professors SMITH, KERR, and SLAUGHTER, and Assistant Professors LAIRD, SOBER, and EMERY.

Courses 12-16 are conducted mainly on the Seminary plan. Courses 12-17 are open to graduates, and, by special permission, to others who have had the junior 3 hour elective, or its equivalent.

18. Comparative Greek Grammar. (See Comparative Philology 3.)

Comparative Philology.

1. Lectures on the principles of the life and growth of language. *Second semester; F., 9.* Assistant Professor LAIRD. (Open to juniors and seniors. A knowledge of Greek and Latin is not required.)
 2. Latin Grammar. History of the sounds and forms. *Second semester; Tu., Th., at 8.* Assistant Professor LAIRD.
 3. Greek Grammar. History of the sounds and forms. *Throughout the year. Tu., Th., at 8.* Assistant Professor LAIRD.
 4. Elementary Sanskrit. Perry's Sanskrit Primer. Selections from Lanman's Reader. *Throughout the year; M., W., 10.* Assistant Professor LAIRD.
 5. Advanced Sanskrit. Selections from the Rig-Veda. Wackernagel's Altindische Grammatik. *Throughout the year; W., 11.* Assistant Professor LAIRD.
- (Courses 3 and 5 are intended primarily for graduates, but are open, by permission, to juniors and seniors.)

LATIN.

PROFESSOR SLAUGHTER, ASSISTANT PROFESSOR SOBER, ASSISTANT PROFESSOR EMERY, DR. ALLEN, AND MR. O'CONNOR.

The attention of students preparing to teach Latin in secondary schools is called to the advanced courses, 6*a*, 7*a*, 9*b*, 10, 11, 12. These courses will be practically required of those who expect a recommendation to teach Latin.

Only courses 4, 5, 8, 9, and 10 can be counted as part of the required major of those who take a thesis in Latin.

Introductory Courses.

1. Cicero and Vergil. Cicero's Orations (three), Vergil's Aeneid (six books), Latin Grammar and Composition. This course is offered for the benefit of students whose preparation in Latin has for any reason been deficient. It can not be counted for the bachelor's degree. *Throughout the year; M., Tu., W., Th., F., at 8.* Mr. O'CONNOR.
2. Cicero, Livy, Terence. Cicero de Senectute, Livy (two books), Terence (two plays), Latin Composition. Required of freshmen of Ancient Classical and Modern

Classical courses and alternative with German for freshmen of the Civic Historical course. *Throughout the year; M., Tu., Th., F.* Four divisions: M. Cl. at 3, A. Cl. at 11, Civ. H. at 8. Assistant Professor SOBER and Dr. ALLEN.

3. Horace. The Odes, Satires, and Epistles of Horace. Required of sophomores of Ancient Classical and Modern Classical courses. *Throughout the year; two divisions. M., W., F., at 9.* Professor SLAUGHTER and Assistant Professor EMERY.

Advanced Courses.

4. (a) Cicero and Catullus. (b) Pliny and Martial. *Throughout the year; Tu., Th., at 9.* Assistant Professor SOBER.
5. Juvenal and Tacitus. *Throughout the year; Tu., Th., at 9.* Assistant Professor SOBER.

Courses 4 and 5 are given in alternate years and are open to all students who have had courses 2 and 3. Course 5 will be given in 1899-1900.

6. (a) Teachers' Course in Caesar. (b) Rapid reading course in easy prose authors. Open to juniors and seniors. *Throughout the year. Tu., Th., at 8.* A third hour will be arranged for students who desire it. Assistant Professor SOBER.
7. (a) Topography and Remains of Ancient Rome; lectures illustrated with lantern slides and photographs. (b) Reading of Latin Inscriptions and Manuscripts. (See Course 18, under History.) Open to seniors and graduates. *Throughout the year; Tu., Th., at 8.* Assistant Professor SOBER.

Courses 6 and 7 are given in alternate years. Course 6 will be given in 1899-1900.

8. (a) Plautus (Captivi and Trinummus). Selections from the fragments of Ennius and Lucilius. (b) Lectures on Roman Literature. *Throughout the year; M., W., F., at 8.* Professor SLAUGHTER.
9. (a) Lucretius. (b) Vergil and the Roman Epic. *Throughout the year; M., W., F., at 8.* Professor SLAUGHTER.

Courses 8 and 9 are open to all students who have had courses 2 and 3, and are given in alternate years. Course 9 will be given in 1899-1900.

10. Exercises in writing Latin. Open to all students who have had course 2. *Weekly throughout the year; Th., at 3.* Professor SLAUGHTER.
 11. Life of the Romans. Lectures, illustrated with lantern slides and photographs. Open to all students. A knowledge of Latin is not necessary for this course. *Weekly throughout the year; Th., at 3.* Professor SLAUGHTER.
- Courses 10 and 11 are given in alternate years. Course 10 will be given in 1899-1900.
12. Latin Grammar. (See Comparative Philology, Course 2.)
 13. Syntax. A course of lectures on Latin syntax is given in connection with the work of the Seminary, and is intended primarily for graduate students. The subjects are: (a) the simple sentence (1899-1900); (b) the compound sentence (1897-8); (c) the cases (1898-9). *Weekly throughout the year; Tu., at 9.* Assistant Professor EMERY.
 14. Seminary. The Seminary is intended for graduate students, but will be open to others of suitable preparation with the consent of the director. To accommodate those who are studying for the doctor's degree, the work is arranged to cover three years: (a) Horace, critical and exegetical study of the Odes (given in 1899-1900); (b) The Roman Drama. The critical work of the Seminary will be based upon the Miles Gloriosus of Plautus. (Given in 1897-8); (c) Lucretius, Bk. III. (Given in 1898-9). *Throughout the year; Tu., Th., at 9.* Professor SLAUGHTER.

HEBREW AND HELLENISTIC GREEK.

PROFESSOR WILLIAMS AND MR. KELLY.

Hebrew, Arabic, and Assyrian.

1. Genesis and the general principles of the Hebrew language. *Throughout the year. Four times a week.* Mr. KELLY.
2. Historical Hebrew. Samuel and textual criticism. *Throughout the year. Twice a week.* Mr. KELLY.
3. Ruth, Esther, Jonah, and selected Psalms. *Throughout the year. Twice a week.* Mr. KELLY.
4. Minor Prophets. *Throughout the year. Twice a week.* Mr. KELLY.

5. Exercises in writing Hebrew. *Throughout the year. Once a week.* Mr. KELLY.
7. Hebrew Seminary. Isaiah forms the center of the work for 1899-1900. *Throughout the year. Once a week.* Professor WILLIAMS.
It is hoped that clubs for the study of Isaiah may be formed in the cities and towns of the state, and that this work may receive direction and help from the work of the Seminary.
8. Psalms and Job. *Throughout the year. Twice a week.* Mr. KELLY.
9. Advanced Hebrew Grammar. *Throughout the year. Twice a week.* Professor WILLIAMS.
10. Elementary Arabic. *First semester. Twice a week.* Mr. KELLY.
11. Advanced Arabic. Selections from the Quran. *Second semester. Twice a week.* Mr. KELLY.
12. Elementary Assyrian. *Throughout the year. Once a week.* Professor WILLIAMS.

Hellenistic Greek.

13. Selected chapters from the Gospels, and the general principles of Hellenistic Greek. For students who have not studied classical Greek. *Throughout the year. Four times a week.* Professor WILLIAMS.
14. Luke and Acts. *Throughout the year. Twice a week.* Professor WILLIAMS.
15. Matthew and Mark. *Throughout the year. Twice a week.* Professor WILLIAMS.
16. John's Epistles and Revelation. *Throughout the year. Twice a week.* Professor WILLIAMS.
17. John. Critical study and textual criticism. Advanced Syntax. *Throughout the year. Twice a week.* Professor WILLIAMS.
18. Pauline Epistles. *Throughout the year. Twice a week.* Professor WILLIAMS.
19. Advanced Hellenistic Greek Grammar. *Throughout the year. Twice a week.* Professor WILLIAMS.

FRENCH.

PROFESSOR OWEN, ASSISTANT PROFESSOR GIESE, MISS GAY, AND MR. SEYMOUR.

Elementary Courses.

1. General Elementary Course. Otto's French Conversation Grammar; Roman d'un Jeune Homme Pauvre and La Petite Fadette (the former read mainly and the latter altogether independently of the class-room); Le Cid, Le Misanthrope, Athalie. *Throughout the year; Tu., W., F., S., at 10.* Assistant Professor GIESE.
2. Special Elementary Course for Classical Students. The same as 1 with the addition of comment on the history of the French language, consideration of Latin etymologies, and treatment of the subject generally from the standpoint of the classics. Additional material for translation will be assigned if the progress of the class allows. *Throughout the year; M., W., F., S., at 9.* Miss GAY.
3. Special Elementary Course for Engineers. A modification of 1 in the interest of the College of Mechanics and Engineering. *Throughout the year; M., Tu., W., Th., F., at 11.* Mr. SEYMOUR.

By subdivision of the above courses, six elementary classes are established, held in part at 8, at 12, or at both hours. As many students desire a reading knowledge only, the effort of the above elementary courses is concentrated upon reading. Students are expected at the end of an elementary course to read with sufficient ease and accuracy to make a practical use of French text-books in the prosecution of their other studies.

Advanced Courses.

4. Composition, etc. Written and oral translation into French from English, dictation, and original composition. *Throughout the year; usually Tu., Th., at 12.* Miss GAY.
5. Continuation of Course 4. *Throughout the year; two hours a week.* Miss GAY.
6. Advanced Reading and Syntax. Reading in class of parts of Cinq-Mars, Ursule Mirouet; reading independently for examination of the Histoire de Charles XII. and other easy French to be assigned. *Throughout the year; M., W., F., at 11.* Professor OWEN.

7. Continuation of Course 6. Reading of *Travailleurs de la Mer*, etc. *Throughout the year; usually Tu., Th., at 12.* Professor OWEN.
8. Conversation. This exercise is open only to students who have finished course 1, 2, or 3, or an equivalent. *Two hours a week throughout the year.* Assistant Professor GIESE.
9. Continuation of Course 8. *Throughout the year; two hours a week.* Assistant Professor GIESE.
10. Lectures on Thought and Language *weekly during the first semester.* At present embodied in course 6.
11. A course in the Principles of Language, confined to correspondence of thought and sentence, especially as illustrated in the English and Roman languages. Given in the first semester of 1899-1900, and offered thereafter other year. Professor OWEN.
12. A general course of lectures on French literature, XVI.—XIX. centuries, with collateral reading. *Throughout the year; M., W., at 12.* Assistant Professor GIESE.
13. A philological course in the oldest French literature. *Throughout the year; two hours a week.* Alternates with course 14. Given in 1899-1900. Miss GAY.
14. A continuation of 13. *Throughout the year; two hours a week.* Miss GAY.

The method pursued in the above will approximate to that of the seminary. Special seminary courses will be furnished whenever this seems desirable.

SPANISH.

ASSISTANT PROFESSOR GIESE AND PROFESSOR OWEN.

1. Elementary. Translations into English of the Spanish exercises in Sauer's Conversation Grammar, Knapp's Spanish Readings and Marsh's *Doña Perfecta*. *Throughout the year; three times a week.* Alternates with Italian. Given during the year 1899-1900. Professor OWEN.
2. Advanced. Reading of selections from Cervantes (*Don Quixote*), from Calderon (*El Magico Prodigioso*), and from modern poets. *Throughout the year; two hours weekly.* Given in 1898-99. Assistant Professor GIESE.

ITALIAN.

ASSISTANT PROFESSOR GIESE AND PROFESSOR OWEN.

1. Elementary. Translation into English of the Italian Exercises in Sauer's Conversation Grammar, and of Manzoni's *I Promessi Sposi*. *Three hours a week throughout the year.* This course is in general like that in Spanish, with which it alternates. Given in 1898-99. Professor OWEN.
2. Advanced. Dante and other classics. *Throughout the year; two hours a week.* Given in 1897-98. Assistant Professor GIESE.

SCANDINAVIAN LANGUAGES.

PROFESSOR OLSON.

This department offers instruction in all of the Scandinavian languages (Norwegian, Danish, Swedish, and Old Norse). From one year's instruction in Modern Norse the student is expected to be able to read both Norwegian and Danish authors, as Norway and Denmark have practically the same literary language. Courses 1 and 2 are devoted principally to Norwegian authors, but additional instruction in Danish and Swedish literature is offered to students desiring to pursue these branches beyond the limits of the prescribed courses.

1. Modern Norse. Elementary. *First semester*, a: Olson's Grammar and Reader, *M., W., F., at 12*; b: Written and oral translation into Norse, *Tu., Th., at 12*. *Second semester*, a: Grammar and Reader continued, Ibsen's *Et Dukkehjem*, and Björnsou's *En glad Gut*, *M., W., F., at 12*; b: Written and oral translation into Norse, the reading of easy prose selections; with exercises in conversation, *Tu., Th., at 12*. Sub-course a may be elected separately.
2. Modern Norse. *First semester*, a: Kielland's *Skipper Worse*, and selections from the Reader, *M., W., F., at 11*; b: Overland's *Laerebog i Norges Historie*, and selections from Norwegian and Danish poetry, *Tu., Th., at 11*. *Second semester*, a: Ibsen's *Brand*, and *Peer Gynt*, *M., W., F., at 11*; b: Tegner's *Frithiofs Saga* (in Swedish), and selections from Swedish poetry, *Tu., Th., at 11*. Sub-courses a and b may be elected separately.

3. History of Scandinavian Literature. Seip and Broch's *Litteraturhistorie*; with lectures in English on modern authors, and papers presented by students on authors under discussion. One meeting a week is devoted to lectures and papers. *Throughout the year; M., W., F., at 10.*
4. Old Norse or Icelandic. Vigfusson and Powell's Reader, with lectures on early Scandinavian history, literature, and mythology. *Throughout the year; Tu., Th., at 10.*

All courses are elective. Any of the courses for which the student is prepared may constitute minor studies under the Group System. Those who make the Scandinavian languages their major line should take all of the courses.

GERMAN.

PROFESSOR ROSENSTENGEL, ASSISTANT PROFESSOR VOSS, MISS STERLING,
MISS REMINGTON, MR. MEISNEST, MISS HERFURTH.

Required Courses.

English and Civic Historical Courses—

1. Grammar and Reading. *Freshman; Tu., W., Th., F., at 4; M., Tu., Th., F., at 8; Tu., W., Th., F., at 2 and 4.* Miss STERLING, MISS REMINGTON, MISS HERFURTH.
2. Historical Reader, and Freytag's „Aus dem Jahrhundert des Grossen Krieges." *Sophomore; M., Tu., Th., F., at 9; Tu., W., Th., F., at 10.* Miss REMINGTON.

General Science Course—

3. Science Reader, and Cohn's Ueber Bakterien. *Freshman; M., Tu., Th., F., at 10.* Miss STERLING, MR. MEISNEST.
4. Scientific Monographs, and Walther's Allgemeine Meereskunde. *Sophomore; M., W., F., at 9.* Miss STERLING.

Engineering Course—

5. Science Reader, Müller's Die elektrischen Maschinen. *Freshman; M., Tu., W., Th., F., at 11.* MR. MEISNEST.

Ancient Classical Course—

6. Grammar, Reader, and Classical Readers. *Sophomore; Tu., W., Th., F., at 8.* MR. MEISNEST.

Modern Classical Course—

7. Reader of German Literature, and Schiller's *Wilhelm Tell*. *Freshman; five times a week at 8.* Miss STERLING, Professor ROSENSTENGEL.
8. Goethe's *Hermann und Dorothea*, and Schiller's *Maria Stuart*. *Sophomore; three times a week.* Professor ROSENSTENGEL.

Elective Courses.

9. Historical Monographs: Schiller's *Egmonts Leben und Tod und Belagerung von Antwerpen*; Schönfeld's *German Historical Prose*, and some historical novel and drama. *Eng. & C. H. junior or senior; M., W., F., at 12.* Miss REMINGTON.
10. a. Lessing's *Nathan der Weise*; Goethe's *Iphigenie auf Tauris*, and Goethe's *Torquato Tasso*. *M. C. juniors; M., W., F., at 9.* Professor ROSENSTENGEL.
- b. Goethe's *Goetz von Berlichingen* (Goodrich's); first semester. Goethe's *Egmont* (Buchheim's), second semester. Alternating with Schiller's *Wallenstein* (Carruth's). *First semester: Wallenstein's Lager and Die Piccolomini. Second semester: Wallenstein's Tod. M. C. juniors; W., F., 12-1.* Assistant Professor Voss.

For Undergraduates and Graduates.

11. Goethe's *Faust*. General survey of the development of German language and literature. *M. C. seniors; M., W., F., at 11.* Professor ROSENSTENGEL.
12. Conversation, Composition, and Translation. *Tu., Th., at 11. F., at 12.* Professor ROSENSTENGEL.
13. Teachers' class. Review of and lectures on German grammar, and systematic practice in teaching German. *Three times a week during the second semester.** Professor ROSENSTENGEL.
14. Lectures on the history of the early German literature, with reading of selections from authors of the periods considered. (Old and Middle High German authors in modern German translations.) *Three times a week.** Miss STERLING.

*Hours and days on consultation.

15. The literature of the 18th and 19th century, especially Goethe and Schiller. Lectures. *Three times a week, first semester.** Professor ROSENSTENGEL.
- [16. The German drama of the present. Lectures, and readings. *Three times a week, second semester.** Professor ROSENSTENGEL.]

GERMAN PHILOLOGY.

ASSISTANT PROFESSOR VOSS.

Introductory Courses.

1. a. Elementary Middle High German. Paul's mhd. Grammatik and extracts from the Nibelungenlied. *Three times a week. First semester.*
 b. Advanced Middle High German. Paul's mhd. Grammatik, Kudrun, and F. Vogt's mhd. Literatur. *Three times a week. Second semester.*
2. Hempl, German Orthography and Phonology and Duden's Etymologie der neuhochdeutschen Sprache. *Once a week, throughout the year.*
3. Early Modern High German. Meyer, Einfuehrung in das Aeltere Neuhochdeutsche. *Two hours. First semester.*
4. History and Grammar of the Modern High German Literary Language, based on Behaghel's Die Deutsche Sprache. *Twice a week. Second semester.*

Advanced Courses.

5. Old High German. Braune's ahd. Grammatik, and readings from Braune's ahd. Lesebuch. *Twice a week. First semester.*
6. Gothic Grammar with readings from the Gospels. Braune-Balg, Gothic Grammar. *Two hours. Second semester.*
7. a. Middle Low German from an historical point of view. Luebben's mhd. Grammatik nebst Chrestomathie. *Twice a week, first semester.*
 b. Old Saxon. Gallée-Behaghel, asaechs. Grammatik, and extracts from the Heliand, ed. Behaghel or Heyne. *Second semester. Two hours. Given in alternate years. 1900-1901.*

*Hours and days on consultation.

8. Studies in the language and literature of the XVI. century. Hans Sachs, Luther, Murner, Brant. Lectures and reading of selections from Braune's *Neudrucke deutscher Litteraturwerke des XVI. und XVII. Jahrhunderts*. *Two hours*. Given in alternate years. 1899-1900.
9. Philological Seminary: A proseminary which meets once a week throughout the year leads up to the work of the seminary. The programme of the proseminary will vary according to the needs of the students. The work of the seminary proper is distributed over three years. The chief aim is to make the student acquainted with the scientific methods used by the foremost scholars and investigators in this line of work, and to teach him to work independently. In the seminary texts of the different stages of the language will be studied from an historical and comparative point of view. In addition to this, the members of the seminary are expected to furnish a paper on a self-chosen subject out of the realm of German philology or higher literary criticism. *Three hours a week, throughout the year*.

In the seminary as well as in all the courses in German philology, German will be used as far as possible.

For the sake of promoting the interest in German philology in the broadest meaning of the word, the "Germanistische Gesellschaft" has been organized to meet every fortnight throughout the year.

ENGLISH.

PROFESSOR FREEMAN, PROFESSOR FRANKENBURGER, PROFESSOR HUBBARD,
ASSISTANT PROFESSOR KNOWLTON, DR. PYRE, DR. CAIRNS, DR.
BEATTY, MR. DODGE, MR. THURBER, AND MR. PRIEST.

1. English Prose Style. Composition. The elements of effective writing in prose, based upon direct study of selected authors, with training in composition, and in methods of investigation and of presenting results. *Three hours a week, throughout the year*. Nine sections. For hours and rooms see time table of required studies. Required of Freshmen in all courses. Professor HUBBARD, Assistant Professor KNOWLTON, Dr. PYRE, Mr. DODGE, and Mr. THURBER.

Rhetoric and Oratory.

2. Rhetoric and Composition. Elective for Sophomores who have finished the required English of Freshman year. *Tu., Th.* Dr. BEATTY.
3. Development of Oratorical Themes. *Tu., Th.* Mr. PRIEST.
4. Advanced Rhetoric. Open to those who have completed courses 1 or 2 above. Analysis of great essays, orations, and prose fiction, with higher rhetorical and literary criticism. Lecturès with supplementary readings. *Throughout the year. M., W., F., at 12.* Elective. Professor FRANKENBURGER.
5. Forensics. *M., W., F., at 11, throughout the year.* Elective. Professor FRANKENBURGER.
6. Analytical study of masterpieces, ancient and modern. *Twice a week throughout the year; Tu., Th., at 11.* Elective. Assistant Professor KNOWLTON.
7. Advanced Composition. This course is supplementary to course 6. *Throughout the year; M., W., F., at 11.* Elective. Assistant Professor KNOWLTON.
8. Rhetorical Seminary. Original composition; the philosophy of criticism with the deduction and application of literary canons. *Two hours a week in one session during the year.* Open to seniors and juniors. Professor FRANKENBURGER, Assistant Professor KNOWLTON, and Dr. BEATTY.
9. Lectures on literary and rhetorical criticism. *Twice a week throughout the year.* Dr. BEATTY.
10. Elocution and Dramatic Reading. Lectures; declamation with personal criticism; Macbeth and Othello, or Julius Caesar and Hamlet. Open to those who have taken course 11 or its equivalent. *Throughout the year; Tu., Th., at 12.* Professor FRANKENBURGER.
12. Elocution. Lectures will be given upon vocal physiology, the proper use and care of the voice, reading, and gesture. *Throughout the year; M., W., F.* Mr. PRIEST.
13. Oratorical Delivery. Open to those who have had sufficient previous preparation to be able to do the work. Declamations, readings, and lectures. *First semester; M., W., F.,* Mr. PRIEST.
14. Elocution. Reading, declamation, and lectures. *Second semester; M., W., F., at 9.* Mr. PRIEST.

15. Elocution and Oratory. (Elective in Law School.) Voice training for effective quality; special drill on methods of reading statutes and other documents before a court or a jury. Practice in declamation and reading from the great orators, and in extempore speaking. Lectures on vocal physiology, and on the use and care of the voice, and on principles of gesture. *Twice a week during the year.* Mr. PRIEST.

Arrangements can be made for private lessons by consulting Mr. PRIEST.

Language.

20. Anglo-Saxon and Middle English. *First semester*, Anglo-Saxon; *Second semester*, Middle English. *Throughout the year; M., W., F., at 9.* Required in the English course, junior year. The work of the first semester may be elected without the work of the second semester. Professor HUBBARD, and Dr. BEATTY.
21. Anglo-Saxon Poetry. Study of selections, survey of Anglo-Saxon literature. *Second semester, M., W., F., at 8.* Open to students who have taken the Anglo-Saxon of course 1. Professor HUBBARD.
22. Beowulf. Introduction to the study of old Germanic life. *First semester; M., W., F., at 8.* Open to seniors. Professor HUBBARD.
23. Modern English Grammar. A course for teachers of English. *Tu., Th., at 9.* Open to students who have taken course 1. Professor HUBBARD.
24. English Philology Seminary. Critical study of texts; historical Grammar; dialects. *Two hours a week throughout the year.* Open to graduates. Professor HUBBARD.
See also Comparative Philology, course 1; French, course 10.

Literature.

30. General Survey of English Literature. This course is prerequisite to all other courses in English Literature. *Throughout the year; M., W., F., at 9 and 11.* Required of sophomores in the English course. This course begins each semester for elective students. They are expected to continue it throughout a year. Dr. PYRE and Dr. CAIRNS.

31. Chaucer. History of the literature of the XIV. and XV. centuries. *First semester; M., W., F., at 8.* Dr. PYRE.
32. The Literature of the Elizabethan Period. *First semester; M., W., F., at 12.* Given in alternate years; 1899-1900, 1901-1902.
33. The Eighteenth Century. *Throughout the year; M., W., F., at 10.* Mr. DODGE. Given in alternate years; 1899-1900, 1901-1902.
34. The English Romantic Movement. *First semester; M., W., at 10.* Professor FREEMAN. Given in alternate years; 1900-1901, 1902-1903.
35. The Victorian Era. *Second semester; M., W., F., at 10.* Dr. PYRE. Given in alternate years; 1900-1901, 1902-1903.
36. The Drama. Shakespeare. *Throughout the year; M., W., F., at 11.* A part of the first semester is devoted to History of the English Drama, the remainder of the year to Shakespeare. Open to seniors. Professor FREEMAN.
37. The Epic. Milton, Spenser. *First semester; Tu., Th., at 10.* Professor FREEMAN. Given in alternate years; 1899-1900, 1901-1902.
38. English Lyric Poetry. *Second semester; Tu., Th., at 10.* Professor FREEMAN. Given in alternate years; 1899-1900, 1901-1902.
39. The Novel. *Second semester; M., W., at 11.* Professor FREEMAN. Given in alternate years; 1900-1901, 1902-1903.
40. American Writers. *Throughout the year; Tu., Th., at 8.* Dr. CAIRNS.
41. Literary Criticism. *Second semester; M., W., at 10.* Professor FREEMAN.
42. Poetics. *First semester; Tu., Th., at 12.* Dr. PYRE.
43. English Literature Seminary. Subject for 1894-95, Robert Browning; 1895-96, Carlyle, Ruskin, Arnold, Newman; 1896-97, Teunyson; 1897-98, Coleridge; 1898-99, Lowell and Emerson; 1899-1900, Chaucer. Two hours a week in one session, *throughout the year; Tu., 8-10 P. M.* Open to graduates and properly qualified seniors. Professor FREEMAN and Professor HUBBARD.

The attention of students who intend to teach English is called to courses 1, 4, and 6.

MATHEMATICS.

PROFESSOR VAN VELZER, PROFESSOR SLICHTER, ASSISTANT PROFESSOR SKINNER, ASSISTANT PROFESSOR DOWLING, MR. RUNNING, AND MR. CHANDLER.

Elementary Courses.

1. Algebra. Progressions, arrangements and groups, binomial theorem, theory of limits, undetermined coefficients, derivatives and series. Text-book: Van Velzer and Slichter's University Algebra. *First semester; three times a week.* Professor VAN VELZER, Assistant Professor SKINNER, Assistant Professor DOWLING, and Mr. RUNNING.
This course will be repeated in the second semester if a sufficient number of students desire it at that time to form a class.
2. Trigonometry. In this course the ratio system is used exclusively and special stress is laid upon goniometry. *Second semester; three times a week; same divisions as course 1.*
3. Algebra (continuation of course 1). This course is elective for all students who have taken course 1. *Second semester; twice a week.* Assistant Professor SKINNER.
4. Analytic Geometry (elementary course). Straight line, conic sections, general equations of the second degree, transcendental curves, and an introduction to geometry of three dimensions. *Twice a week for one year.* Assistant Professor DOWLING.
5. Calculus (elementary course). Differentiation and integration of functions of one variable with the usual geometric applications. *Three times a week for one year.* Assistant Professor DOWLING.

Advanced and Graduate Courses.

6. Elliptic Functions. This course must be preceded by course 9. *Twice a week for one year.* Assistant Professor DOWLING.
8. Calculus (advanced course). Partial derivatives and multiple integrals with the usual geometric applications. *Twice a week for one year.* Assistant Professor DOWLING.

9. Differential Equations. Ordinary and partial differential equations with a few geometric and mechanical applications. This course must be preceded by course 8 or taken along with it. *Three times a week for one year.* Professor VAN VELZER.
10. Higher Trigonometry. This course must be preceded by course 5. *Second semester; twice a week.* Assistant Professor SKINNER.
11. Analytic Geometry of Two Dimensions (advanced course). Modern methods in plane analytic geometry. This course must be preceded by course 4. *Three times a week for one year.* Professor VAN VELZER.
12. Theoretical Mechanics. An elementary course in analytical mechanics. This course may be taken by those who have had analytic geometry and calculus. *Three times a week for one year.* Professor SLICHTER.
13. Newtonian Potential Function. Lectures and required readings on the theory of potential with an introduction to spherical harmonics. *Twice a week for one year.* Professor SLICHTER.
14. Projective Geometry. *Twice a week for one year.* Assistant Professor DOWLING.
15. Analytic Geometry of Three Dimensions. This course should be preceded by courses 8 and 11. *Twice a week for one year.* Professor VAN VELZER.
16. Quaternions. *Twice a week for one year* in alternate years. This course will not be given in 1898-99. Assistant Professor SKINNER.
17. Theory of Functions. *Three times a week for one year* in alternate years. Assistant Professor DOWLING.
18. Partial Differential Equations of Mathematical Physics. Based on Riemann's Lectures, and Byerly's Spherical Harmonics. This course will be given in 1899-1900. *Twice a week for one year* in alternate years. Professor SLICHTER.
19. Theoretical Hydrodynamics. Lectures on fluid motion. *Twice a week for one year* in alternate years. This course will be given in 1900-1901. A course in Theory of Elasticity may be substituted for this course. Professor SLICHTER.

20. Modern Algebra. Invariants, covariants, etc. This course must be preceded by courses 3 and 8. *Twice a week for one year* in alternate years. Professor VAN VELZER.
21. Theory of Substitutions. *Three times a week for one year* in alternate years. Assistant Professor SKINNER.
22. Theory of Numbers. *Twice a week for one year* in alternate years. Professor VAN VELZER.

Other Advanced Courses. To graduates and others prepared to take them, courses will be given when desired in definite integrals, advanced differential equations, Abelian functions, and higher plane curves.

Mathematical Group.

Students who desire to take the degree of B. A., B. L., or B. S. in mathematics will be admitted to the mathematical group at the beginning of the sophomore year. Such students may omit studies prescribed for the sophomore year of the course to an amount not exceeding six hours a week and substitute five hours a week of mathematics therefor. Students expecting to write theses in applied mathematics should take the course in mathematics in their junior year.

ASTRONOMY.

PROFESSOR COMSTOCK.

1. General Astronomy. Fundamental concepts of astronomy and the more important problems associated with them, so far as the latter admit of treatment by elementary methods. This course is essentially non-mathematical. *Three times a week during the first semester.*
2. Observatory Work and Methods. This course can be undertaken only by students who have completed course 1 in physics, the mathematics of freshman year, and course 1 in astronomy. The mathematics of the sophomore year must either precede or be taken concurrently with the course. *First semester, twice a week; second semester, three times a week.*
3. Special Topics in Celestial Mechanics. Integration of the equations of motion. Computation of ephemerides for undisturbed motion. Double star orbits. Comet orbits. Special perturbations.

This course presupposes in the student a working knowledge of the infinitesimal calculus and the elements of dynamics. *First semester, three times a week; second semester, twice a week.*

4. Astrophysics. An elementary course in astrophysics with special reference to spectroscopy and photometry is offered to students who have completed course 1 in astronomy. Especial attention will be given to the experimental side of the subject, including the use of the instruments both in the laboratory and when attached to the telescope. *Second semester, three times a week.*
5. Graduate Courses. Graduate students and others desiring to pursue advanced astronomical studies will be received in the Washburn Observatory as assistants and will take part in the regular series of observations with the equatorial telescopes or with the meridian instruments, at the same time continuing their theoretical studies. Facilities for independent original work will be afforded to such students, and such work, if of sufficient value, will be printed in the Publications of the Washburn Observatory. Ten volumes of these Publications, representing the work of the observatory prior to 1897, have already been issued.

For other courses of instruction consult the title Astronomy, in the announcement of the College of Mechanics and Engineering. See, also, the title Washburn Observatory.

PHYSICS.

GENERAL PHYSICS: PROFESSOR SNOW, ASSISTANT PROFESSOR AUSTIN, MR. WOOD, MR. SMITH, MR. FERRY AND MR. SHEDD.

MATHEMATICAL PHYSICS: PROFESSOR DAVIES.

Elementary Course.

1. General Lectures and Introductory Laboratory Practice. Given as a full study throughout the year. Required of students in the General Science and Engineering courses. Also elective for students in all other courses. A knowledge of plane trigonometry including the use of logarithms is required for registration. Lectures *M., Tu., W., Th., at 12 o'clock.* Professor SNOW. One recitation by the class

in smaller sections at hours to be assigned. Professor SNOW, Mr. FERRY, and Mr. SMITH. Laboratory practice twice a week at hours to be arranged. Assistant Professor AUSTIN, Mr. WOOD, Mr. SMITH, and Mr. FERRY.

Advanced Courses.

2. Advanced Laboratory Practice. Presupposes the completion of course 1 or its equivalent. Required of juniors in the Physics Group and elective for all other courses. *Three times a week throughout the year.* Assistant Professor AUSTIN and Mr. WOOD.

3. Thesis Work. Required of seniors in the Physics Group. Full study throughout the year. Professor SNOW, Assistant Professor AUSTIN and Mr. WOOD.

At the beginning of the first semester, the student is expected, with the advice of the instructors, to take up some special line of investigation, which is to be conducted, under the direction of those in charge of the department, throughout the year.

4. Precision of Electrical Measurements. A laboratory course in the exact determination of electrical quantities. *First semester; three times a week; hours to be assigned.* Required of juniors in Electrical Engineering. Mr. FERRY.

5. Theoretical Physics. Part I. Mathematical Introduction and Mechanics. Part II. Elementary Electricity and Magnetism. *Three hours per week throughout the year.* Required of juniors in the Physics Group. Assistant Professor AUSTIN.

6. Theoretical Physics. Part III. Theory of Heat, including gas theory and elementary thermo-dynamics. Part IV. Theory of Light, based on Preston's Light as a text, but with a more complete treatment of the dispersion theory and diffraction. *Three hours per week throughout the year.* Required of seniors in the Physics Group. Mr. WOOD.

Courses 5 and 6 are open to all students who desire a more thorough knowledge of physics than can be obtained in the general course. The small amount of the higher mathematics required is given in the introduction.

7. Introduction to the Study of Mathematical Physics. This course of lectures will treat of the fundamental equations

of mathematical physics, and will be preparatory to the more advanced courses in mathematical physics. *Three times a week throughout the year.* Elective for juniors and seniors in the Physics Group. Professor DAVIES.

Courses Primarily for Graduates.

8. History of Mathematical Physics in the Nineteenth Century. This course is primarily intended for graduate students having a fair knowledge of the elements of mathematical physics, but is also open to such undergraduate students as can avail themselves of it. *Twice a week throughout the year.* Professor DAVIES.
9. Mathematical Theory of Sound. This course presupposes the equivalent of course 7. A knowledge of differential equations will also be required. *Throughout the year; M., W., F., at 2.* Professor DAVIES.
10. Mathematical Theory of Electricity and Magnetism. This course follows the treatment of the subject as given in Gray's Treatise on Magnetism and Electricity, and Webster's Electricity and Magnetism. *Four lectures a week throughout the year.* Professor DAVIES.
11. Mathematical Physics. This course will supplement course 7. It will be mainly concerned with waves in elastic media, including electro-magnetic waves and light. The subject will be taught by lectures, reference being made to standard works on theoretical physics. *Three times a week throughout the year.* Professor DAVIES.
This course can be continued as a graduate course by such students as desire to make a specialty of the subject.
12. Terrestrial Magnetism and Compass Deviations. Part I. General, and as far as possible without the aid of mathematics. Part II. Advanced course using all necessary mathematics. *Twice a week throughout the year.* Professor DAVIES.
13. Graduate Research. This course is designed for those who have completed the equivalent of the work represented by the undergraduate courses, and who now desire to devote some time to investigation in special lines. No feature of the department is emphasized more strongly than this. Persons desiring to enter upon such a course are advised,

with the assistance of the instructors, to select some special line of research to which several months of time may be devoted. This work will be encouraged by reserving rooms in the laboratory which are devoted exclusively to research work, and by securing whatever special apparatus may be necessary to the successful carrying out of original investigation. Professor SNOW, Professor DAVIES, Assistant Professor AUSTIN, Mr. WOOD.

14. Colloquium. A class, meeting one evening each week, for the critical reading and discussion of the current periodical literature. Professor SNOW, Professor DAVIES, Assistant Professor AUSTIN, Mr. WOOD, Mr. SMITH, Mr. FERRY, and Mr. SHEDD.

Required of all students in the Physics Group.

CHEMISTRY.

PROFESSOR DANIELLS, ASSISTANT PROFESSOR HILLYER, ASSISTANT PROFESSOR KAHLENBERG, MR. LINCOLN, AND MR. BASSETT.

1. General Elementary Chemistry. A daily exercise throughout the year as follows: *First semester.* Descriptive Inorganic Chemistry; lectures and laboratory work. *Lectures at 2.* Professor DANIELLS, Assistant Professor HILLYER, Mr. Cook, and Mr. Fowler. *Second semester.* Qualitative Analysis until the Easter recess; then Descriptive Organic Chemistry, lectures and laboratory work. Assistant Professor HILLYER, Mr. COOK, and Mr. FOWLER.
2. Advanced Inorganic Chemistry, second year, and Quantitative Analysis. *Daily throughout the year.* The amount of time devoted to this subject may be more or less than that of a full study, and will be arranged upon consultation with the instructors. Professor DANIELLS and Assistant.
3. Advanced Inorganic Chemistry, third year. The amount of time and the character of the work will be arranged upon consultation with the instructors. Besides the work required for a graduation thesis, it may consist of advanced work in theoretical, physical, or analytical chemistry, or in research work. Professor DANIELLS and Assistant Professor KAHLENBERG. For graduates and undergraduates.

4. Toxicology, etc. A course in toxicology, urine analysis, and sanitary water analysis will be given the second semester of each year. Open only to those who have taken at least one semester of quantitative analysis. Professor DANIELLS.
5. Quantitative Analysis for students in Pharmacy, daily during the first half of the first semester. Professor DANIELLS and Mr. LINCOLN.
6. Water Analysis for students in Engineering. *Daily during the second semester.* Professor DANIELLS.
7. Advanced Organic Chemistry. Reviews and expansion of the work of the elementary course, with laboratory work mainly in the preparation of aromatic compounds, accompanied by special work on assigned topics. *Full study; first semester.* Assistant Professor HILLYER.
8. Study of methods of preparation of organic compounds: oxidation, reduction, hydrolysis, dehydration, preparation of salts. Following this work either organic analysis may be taken up or the study of organic compounds of special interest to those preparing for medicine or work in the biological sciences. For graduates or undergraduates. Assistant Professor HILLYER.
- 8a. Investigations in organic chemistry. Students who desire some problem in organic chemistry as a subject for the senior thesis should make known their desire at the close of junior year so that the subject may be assigned and preliminary study may be done during the summer session or vacation. Graduates who intend to study organic chemistry should announce their intention at the earliest date, with a statement of their preparation, so that lines of study may be suggested to be pursued before the opening of the first semester of attendance. A knowledge of French and German is necessary. Professor HILLYER.
9. Physical Chemistry. General Course. *Full study throughout the year. Lectures and recitations, first semester; Tu., Th., at 8. Second semester; M., W., F., at 8.* The lectures and recitations are supplemented by laboratory exercises in physico-chemical measurements, thus making a full study. This course must be preceded by course 1 in chemistry. Assistant Professor KAHLENBERG.

10. Electrochemistry. Lectures and recitations twice a week. Laboratory work in electrochemical measurements and in electrolysis of various chemical compounds supplements the lectures and with them makes a full study. *Throughout the year at hours to be arranged.* Assistant Professor KAHLENBERG.
11. Special Laboratory Course in Physical Chemistry. This course is for seniors in engineering who desire an acquaintance with the methods of physico-chemical measurement. Full study for the first semester. Hours on consultation. Assistant Professor KAHLENBERG.
12. Research Work in Physical Chemistry. Students having sufficient training may take up research work in physical chemistry, to which special importance is attached and for which every facility is furnished. This course is especially designed for seniors who desire to prepare a thesis and for graduates seeking higher degrees. The character of the work will be determined largely by the preparation that the student has and by his individual inclinations. *Daily throughout the year at hours to be arranged on consultation.* Assistant Professor KAHLENBERG.
13. Seminary in Physical Chemistry. Advanced students meet for more detailed study of special subjects and of original researches in physical chemistry. The work will be conducted on the seminary plan. *Throughout the year, at least once a week, at hours to be arranged on consultation.* Assistant Professor KAHLENBERG.

The chemical library is well supplied with works of reference and with chemical periodicals, enabling students to familiarize themselves with the most recent investigations bearing upon the work in hand.

The division of time between organic and inorganic chemistry for the junior and senior years will be made after consultation with the instructors.

Instructors and advanced students meet weekly during the year to report on articles in the current chemical journals and on assigned topics suggested by recent work in chemistry. Nearly all the more important chemical journals are accessible for use in this work, and the department library is steadily growing by accessions of the best books of reference.

GEOLOGY AND MINERALOGY,

PROFESSOR VAN HISE, ASSISTANT PROFESSOR HOBBS, AND ASSISTANT PROFESSOR CLEMENTS.

For students who wish to take a general educational course in geology no definite prerequisites are specified. To pursue successfully a long course in mineralogy or geology, physics and chemistry are prerequisite. Further, all students who intend to take geology as a major study should, if possible, take mineralogy 2 during the first semester of the previous year, and a full year's work in this subject is a very advantageous preparatory study to advanced work in geology. It is advised that when possible the mineralogy be taken in the sophomore year. Under the Group system the courses are arranged by the professor in charge. The special work may be geology, under Professor VAN HISE and Assistant Professor CLEMENTS, or mineralogy or petrology, under Assistant Professor HOBBS.

GEOLOGY.

PROFESSOR VAN HISE, AND ASSISTANT PROFESSORS HOBBS AND CLEMENTS.

1. Part I. General Geology. *Three times a week*: The geological forces now modifying the world; their past, present, and future work. *Twice a week*: The physiography of the United States, each province being treated in reference to its development, and in its relations to population. These courses are especially adapted to students who intend to teach physical geography, those making a specialty of history, and those wishing to obtain a general comprehension of the character of the earth upon which we live. Numerous short excursions. First semester to holiday vacation. *M., Tu., W., Th., F., or M., W., F., at 12.* Professor VAN HISE.

Part II. Historical Geology. Special emphasis is given to the history of the North American continent, including both the development of the continent itself and of the forms of life which have inhabited it. Lecture room and laboratory work. First semester from holiday vacation. *M., Tu., W., Th., F., at 12, or M., W., F., hours to be determined.* Assistant Professor CLEMENTS.

Required of seniors in civil engineering. This course is so arranged that it can be taken as a three-fifths study for the first semester.

2. Part I. Applied Geology. Treats of potable waters, structural materials, soils, mineral fertilizers, mineral fuels, iron, copper, lead, and zinc ores. Other ores, in addition to these, will be considered if the students desire it and there is sufficient time. Must be preceded by course 1. Required of seniors in civil engineering. First six weeks of second semester. *M., Tu., W., Th., F., at 12.* Equivalent to two-fifths study for one semester. Assistant Professor CLEMENTS.

Part II. Field Geology. Study of selected areas adjacent to Madison. In different years the work has included a study of the lakes, a study of the Pleistocene deposits, and a study of the Paleozoic rocks. In each of these studies areal maps have been made. The particular line of work followed in any given year depends upon the size and character of the class. An excursion of several days' length is taken to study the districts including the quartzite ranges of Baraboo and the Dalles of the Wisconsin. Last 12 weeks of second semester. *F., 2-6, Sat., 9-1, and 2-6.* Equivalent to three-fifths study for the semester. This course may be taken by students having had course 1 as a three-fifths or five-fifths study, although the latter is recommended. Professors CLEMENTS and VAN HISE.

3. Systematic Paleontology. Students will have an opportunity of becoming familiar with the most characteristic fossils, by examination in the lecture room and more detailed study in the laboratory. *First semester; M., W., F. Hours to be determined on consultation.* Assistant Professor CLEMENTS.
4. Petrology. (a) General petrology and microscopic petrology. The characteristics of rocks and their geological classification. *First semester; Tu., Th., at 9.*
(b) Microscopic petrology. The study of rocks as mineral aggregates with the aid of the petrographical microscope. *Second semester; M., Tu., W., Th., F., 9-11.* Assistant Professor HOBBS.

5. Graduate Courses. The epigene and hypogene phenomena of physical geology, as seen in the field and in the laboratory, are treated with reference to the laws of energy.

(a) General Physical Geology. Sedimentation by all agents. The deformation of rocks, including an analysis of folds, cleavage and fissility, faults, joints, and autoclastic rocks. Mountain-making. Stratigraphy, including a discussion of bedding, basal conglomerates, unconformity, structural work in non-fossiliferous rocks, and practical methods of field work. Lectures and seminary work. Professor VAN HISE.

(b) Principles of Metamorphism and the Metamorphic Rocks. Underground waters. The principles controlling the deposition of ores. The forces, agents, and general processes of metamorphism. Classification and description of the metamorphic sedimentary and metamorphic igneous rocks. Lectures and laboratory work. Professor VAN HISE.

(c) The Physical Geology of the United States. Each of the geological provinces is taken up separately, and considered in reference to its sediments, deformation, economic resources, and physiography. Lectures and seminary work. Professor VAN HISE.

All of these subjects are considered from the point of view of the investigator. In any one year only one of the courses (a), (b), and (c) is given. The course selected for any year depends upon the needs of the advanced students. Each of the courses runs through the year in such a manner as to be equivalent to a full study for one semester. Each of the courses is accompanied by seminary and laboratory work.

6. Research Work for Graduates. Research work adapted to the individual applicant is offered. Under the advices of the professors this work may be on an investigation which has already been undertaken by the student, or, if desired, the work will be assigned by the instructors. For this work, besides the ordinary Museum material, there is available the very large collection of rocks and slides belonging to the United States Geological Survey, from all parts of America, and smaller, but still large, collections of European rocks. (See statement under Geolog-

ical Museum.) This material furnishes exceptional opportunities for research work in petrography and metamorphism. To advanced students are assigned sets of this material for study in connection with the general investigations being carried on by the officers of the departments.

A full or double study, as desired by the individual students. Professors VAN HISE and HOBBS.

MINERALOGY.

ASSISTANT PROFESSOR HOBBS.

1. *General Course.* Prerequisite, a general course in chemistry. Trigonometry should be taken if possible. Crystallography, physical mineralogy (except optical mineralogy), chemical mineralogy, study of the non-silicate minerals. *First semester; M., Tu., W., Th., F., at 11.*
(a) Study of the silicate minerals. (b) Blowpipe analysis and determinative mineralogy. *Second semester; M., Tu., W., Th., F. (a) at 11. (b) at 11-1.*
2. *Short Course.* Especially adapted to the needs of Engineering students. The quick method of determining the common minerals, and especially those of economic importance. This course is required of Civil Engineers in their sophomore year. *First semester; M., W., 9-11.*
3. *Optical Mineralogy.* Lectures, quizzes, and laboratory work with the polarizing microscope. A prerequisite to petrology. *First semester; M., W., F., 9-11.*
4. *Crystallography.* A course in the goniometrical and optical determination of crystals, especially adapted to students of chemistry and pharmacy. This course is given only when a sufficient number of students desire it. *First semester; Tu., Th., at 9.*
5. *Graduate Course Advanced Crystallography.* The measurement and calculation of crystals. Individual work arranged with the instructor.

BIOLOGY.

PROFESSOR BIRGE, PROFESSOR HARPER, PROFESSOR RUSSELL, ASSISTANT PROFESSOR MILLER, ASSISTANT PROFESSOR MARSHALL, ASSISTANT PROFESSOR CHENEY, ASSISTANT PROFESSOR TRUE, MR. FROST, AND MR. SMITH.

1. General Biology. Introductory to both botany and zoology, and required as preliminary to all advanced work in either department. Two recitations or lectures and eight hours' laboratory work a week, using as handbooks Arthur, Barnes & Coulter's Plant Dissection and Marshall's The Frog.

Lectures, M., W., at 3. Professor HARPER and Professor BIRGE. For laboratory work the class is divided into two or three sections, each meeting for two hours daily. Dr. MARSHALL and Mr. SMITH. Quiz divisions are also required to meet at least once each week. Required of freshmen in General Science course, elective in other courses.

The first semester is devoted to a study of the general principles of biology as illustrated by plants. The second semester is given to zoology. Students can enter the course in either semester.

Zoology.

2. Vertebrate Anatomy. Laboratory work and lectures. First semester, the skeleton, muscles, and viscera; second semester, the nervous and vascular systems. *Throughout the year; 11-1.* Assistant Professor MILLER.
3. Invertebrate Zoology. A general course in the morphology and classification of Invertebrates. *Throughout the year. Full study.* Professor BIRGE.
4. Human Physiology. A. Nutrition, respiration, excretion. *First semester; M., W., F., at 8.* B. Motion, nervous system, and sense organs. *Second semester; Tu., Th., 8.* Text-book, Martin's The Human Body. Professor BIRGE.
5. Vertebrate Histology. Laboratory work and lectures. This course should be preceded by course 2. *Full study; first semester, 9-11.* Assistant Professor MILLER.

6. Vertebrate Embryology. This course follows course 5. The development of the chick during the first four days is studied. Laboratory work and lectures. *Full study; second semester, 9-11.* Assistant Professor MILLER.
7. Advanced work in Histology and Embryology. This course is open to graduate students and such undergraduate students as may wish to carry on their work along special lines. Courses 2, 6, and 7 are prerequisite. Modern methods of research and reconstruction methods will receive special attention. Assistant Professor MILLER.
8. Thesis work in Vertebrate Anatomy, Histology, or Embryology. Students who make the course in vertebrate anatomy their major study will take course 2 in their sophomore year, and courses 6 and 7 in their junior year, leaving the senior year free for thesis work. The subject of the thesis should be selected during the junior year, and the preliminary work begun. Assistant Professor MILLER.
9. Entomology. A general course in the anatomy, embryology, and classification of insects, with special attention to forms of economic importance. *First semester; full study.* Assistant Professor MARSHALL.
10. Invertebrate Embryology. The segmentation of the egg, and the formation of gastrula in various groups of invertebrates, and the leading types of metamorphosis of invertebrates. *Second semester; full study.* Assistant Professor MARSHALL.
11. Research Courses in the Study of Plankton and Invertebrate Zoology. For senior theses, and graduates. Group students in zoology may take their major subject in invertebrate zoology, following courses 1 and 3 by 10. Professor BIRGE and Assistant Professor MARSHALL.

Students can take a major line of study in either invertebrate or vertebrate zoology. Persons intending to teach zoology in high schools should take at least course 3 in addition to course 1.
12. Summer Courses in Zoology. See announcement of summer session on later pages.

Botany.

15. Plant Morphology. The course presupposes course 1. Lectures and laboratory work. *Daily*, 2-4. Professor HARPER.
16. Vegetable Histology. Systematic study of the tissues of phanerogams and ferns. Use of reagents and stains, modes of imbedding, section cutting, and mounting. Laboratory guide: Strasburger's Practical Botany. *Daily, first semester; hours on consultation.* Assistant Professor CHENEY.
17. Cytology. General physiology of organisms. Lectures and experimental work on the reproduction, irritability, and nutrition of the cell. Must be preceded by courses 15 or 16 and an ability to read German is desired. *Daily. Hours on consultation.* Professor HARPER.
18. Mycology. Special work on the morphology and classification of the fungi or in plant pathology is offered to advanced or graduate students. *Hours on consultation.* Professor HARPER.
19. Botanical Methods. Methods of preparing plant tissues and of growing various algae and fungi for use in the class room; practice in simple demonstrations in Physiology. *Three times a week, second semester. Hours on consultation.* Professor HARPER and Mr. SMITH.
20. Research work. Students whose preparation is adequate may on consultation be assigned special subjects of investigation. Professor HARPER.
21. General Morphology of Plants. An elementary course designed primarily for pharmacy students, but open to others who desire to begin the study of botany. *First semester*, the morphology of fungi, algae, lichens, mosses, and ferns. *Second semester*, the form and structure of the organs of seed plants, the identification of selected flowering plants and the preparation of an herbarium. The course will be supplemented by botanical excursions. *Daily*, 8-10. Excursions on Saturdays. Assistant Professor CHENEY.
22. Trees and their Characteristics. A course designed for those who desire to acquaint themselves with forest trees. Lec-

tures and laboratory work with occasional excursions. The course presupposes the equivalent of one semester's work in general botany. *Twice a week through the year.* May be taken either semester or both. *Hours to be arranged on consultation.* Assistant Professor CHENEY.

23. Advanced Work in Anatomy. Special subjects for original investigation will be assigned to such students as are properly qualified, and who desire to do advanced work. Assistant Professor CHENEY.
24. Experimental Vegetable Physiology. Biology 15 or 16, Chemistry 1, and Physics 1 and 2 must precede this, and it is desirable that those taking it should be able to read German readily. *First semester*, Physical Physiology; *second semester*, Chemical Physiology. *Daily; hours on consultation.* Assistant Professor TRUE.

Advanced work in Physiology of Plants will be offered for students adequately prepared. Subjects will be assigned on consultation. Assistant Professor TRUE.

25. Plant Ecology. A discussion of effects exerted on plants by the principal factors of their environment. Frequent excursions will be made to parts marked by various ecological conditions. *Three lectures per week during second semester. Elective.* Assistant Professor TRUE.
26. Pharmacognosy for Pre-Medical Students. This course provides for the presentation of the essentials of pharmacognosy. *First semester; three times a week; two lectures and two hours' laboratory work per week.* Assistant Professor TRUE.
27. Summer Courses in Botany. See announcement of the summer session on later pages.

Bacteriology.

30. General Bacteriology. This course considers the bacteria in their general biological aspect. This course is fundamental and should be regarded as a basis on which further specialization along lines of applied science can take place, as in medical, sanitary, and dairy bacteriology. Applicants must be thoroughly familiar with the compound microscope. *Lectures or*

equivalent M., W., F., at 11. First semester. Full study.
Professor RUSSELL and Mr. FROST.

31. Medical Bacteriology. This course is especially designed for pre-medical students. Course 30 is a pre-requisite. *Lectures twice a week, M., F., at 11. Full study, second semester.* Mr. FROST.
32. Thesis Work in Bacteriology. Students who desire to select their theses in this department must take course 30 in their junior year or before, and select the subject for their thesis before the close of the junior year. Professor RUSSELL and Mr. FROST.
33. Advanced Work in Bacteriology. Students who have had sufficient preliminary work (courses 30 and 31 or their equivalent) will be assigned special topics for study. Laboratory work and conferences. Professor RUSSELL and Mr. FROST.
34. Research Work in Bacteriology. Opportunity is offered for work in original investigation which may be arranged for on consultation. A reading knowledge of French and German is necessary. Professor RUSSELL and Mr. FROST.
35. Communicable Diseases: Their Cause and Prevention. Weekly lectures of a non-technical character, intended primarily for students in other than the General Science Course. No previous work in science is required. *Second semester, one-fifth study.* Mr. FROST.
36. Biology of Water Supplies. This course is adapted to the needs of students in Sanitary Engineering. *First semester, full study, lectures and laboratory work.* Required of juniors in Sanitary Engineering. Mr. FROST.

For Courses in Dairy and Agricultural Bacteriology see announcement under College of Agriculture.

The Bacteriological Journal Club meets bi-monthly on Thursdays for the review of Current Bacteriological literature.

MUSIC.

PROFESSOR PARKER.

The courses in music are open as electives to students in any department of the University who show sufficient musical ability to pursue them with profit.

For admission to course 1, no previous knowledge of music is required.

Those desiring to take course 2 must be able to read and play simple four-part music. Course 1 will be found useful in strengthening preparation for the courses in Harmony and Counterpoint. Courses 1 and 2, or their equivalent, are required as a preparation for course 6.

Students may be admitted to advanced courses on examination.

Special students may substitute private lessons in piano playing or singing for one or more studies on recommendation of the Professor of Music. See the statement of the School of Music on subsequent pages.

Classes meet in Room 12, Ladies' Hall.

1. Musical Theory and Choral Practice. *Two hours a week. Throughout the year; M., W., at 5.*
2. Elementary Harmony. *Two hours a week. Throughout the year; Tu., Th., at 4.*
3. Advanced Harmony. *Three hours a week. First semester; M., W., F., at 11.*
4. Counterpoint. *Three hours a week. Second semester; M., W., F., at 11.*
5. Double Counterpoint and Fugue. *Three hours a week. Throughout the year; M., W., F., at 10, subject to change.*
6. Musical Composition. *Two hours a week. Throughout the year; hours to be arranged.*
7. History of Music. Lectures. *Two hours a week. Throughout the year; Tu., Th., at 3.*
8. Advanced Piano Playing. Senior and junior years only. Hours and credit to be arranged with the instructor and director of the School of Music, but not to exceed a total of 5-5 for one year.

Students who are competent may join the University Orchestra, receiving a credit of 1-5 for the work. One rehearsal each week. *Throughout the year; Sat., 11 to 1.* Mr. NITSCHKE.

Students who desire to become connected with the University Military Band, or any of the student musical organizations, should confer with Mr. Nitschke.

MILITARY SCIENCE AND TACTICS.

CAPTAIN CURTIS, U. S. A.

This department of the University is maintained in accordance with the statutes of the United States and the State. By the regulations of the University, all the able-bodied male students of the freshman and sophomore classes, and of special courses, for the first two years of such courses, are required to take military drill.

The work of the department embraces a course in drill regulations, a course of lectures on military subjects and practical instruction in the school of the soldier, company, and battalion, target practice, artillery drill and signal drill. The class in drill regulations is organized each year, and may be elected by both classes. All commissioned officers, the sergeant-major, quartermaster-sergeant and first sergeants are required to take the course, which continues through the winter. The study value of drill regulations and the lecture course is that of a two-fifths and one-fifth study respectively.

Freshmen who, prior to their entering the University, have received the equivalent of one year's instruction in the University battalion, may be required to drill during their freshman year only; *provided*, that they furnish certificates from the superintendents of military schools where they have attended, or commanding officers of military companies with which they have served, setting forth in detail the military duty performed; and that they take the full course in drill regulations, maintaining a good class standing.

Drill for both classes begins at the opening of the first semester and is held twice a week throughout the year.

The uniform of the battalion is similar to the fatigue or undress uniform of the army, and can be obtained in Madison at a cost of \$9.50 to \$15.00.

ORGANIZATION.

The organization is that of a regiment consisting of two battalions of three companies each, a brass band of over twenty pieces, a bugle corps, and a signal company. Students are at liberty to enter any organization except the signal company. The latter consists of those selected by the Commandant.

The regiment has a full quota of officers. The field officers are selected from the senior class, the captains from the junior

class and the lieutenants and non-commissioned officers from the sophomore class.

Upon graduation specially qualified students receive from the Governor of Wisconsin State commissions of honorary second lieutenants.

Roster for 1898-99.

Commandant.

Captain Charles A. Curtis, U. S. Army.

Student Officers.

FIELD AND STAFF.

Colonel Charles A. Vilas.

Lieutenant Colonel Frederick A. Schroeder.

Major Orsamus Cole, Jr., Adjutant.

Major John H. Stauff, Quartermaster.

Captain William S. Nies, Assistant Quartermaster.

Sergeant Major Mark H. Newman.

1ST BATTALION.

Major Frank H. Kurtz.

Adj., Lieut. E. W. Underwood.

Sergt. Major M. H. Newman.

2D BATTALION.

Major P. L. Allen.

Adj., Lieut. W. C. Burdick.

Sergt. Major Eric W. Allen.

COMPANY OFFICERS.

A—Captain H. N. Carter.

1st Lieut. J. H. McNeel.

2d Lieut. H. E. Bradley.

1st Sergt. A. B. Carter.

2d Sergt. F. L. Hook.

B—Captain B. M. Palmer.

1st Lieut. D. A. Henkes.

2d Lieut. B. N. Bridge.

1st Sergt. J. E. Smith.

2d Sergt. J. B. E. Schubring.

C—Captain L. E. Moore.

1st Lieut. J. C. Gaylor.

2d Lieut. A. S. Nielson.

1st Sergt. C. J. White.

2d Sergt. J. B. Graham.

COMPANY OFFICERS.

D—Captain J. M. Dreyer.

1st Lieut. N. L. Hurd.

2d Lieut. F. D. Gaylor.

1st Sergt. E. L. Harvey.

2d Sergt. H. E. Severson.

E—Captain C. E. Gabel.

1st Lieut. N. S. Hendrickson.

2d Lieut. G. A. Fritsche.

1st Sergt. W. F. Dickinson.

2d Sergt. G. W. Groffman.

F—Captain H. H. Gaylor.

1st Lieut. H. M. Rhode.

2d Lieut. P. Stover.

1st Sergt. R. Chase.

2d Sergt. A. V. Smith.

PHYSICAL EDUCATION.

DR. ELSOM, MISS MAYHEW, MISS HARRIS, AND STUDENT ASSISTANTS
DAVIES, ISHIKAWA, AND PETERSON.

Gymnastics for Men.

The Armory and Gymnasium is 200 feet in length, 100 feet in width, and three stories in height. On the ground floor are ample accommodations for bathing, such as shower and spray baths, tubs, and a natatorium 80 feet long by 20 feet wide. Lecture-room, offices, and locker-rooms are found also on this floor, the latter fitted up with 600 lockers for the use of students. Four bowling alleys, thoroughly equipped, have been placed in an attractive portion of the ground floor. On the main floor, besides the necessary offices, there is an unobstructed hall 165x95 feet in dimension, for the purpose of military drill and gymnastic practice. This room is thoroughly fitted with the most improved and latest scientific developing apparatus. The gymnasium in its equipment is not surpassed by any in the West, and in size it is absolutely the largest in the United States. On the third floor is the padded running track, twelve laps to the mile; a base-ball cage, 160 feet in length; two rifle ranges, hand-ball, and tennis courts, etc., besides space for general indoor athletic practice.

Each student on entering the department undergoes a thorough physical examination, in order that his physical condition may be known, and suitable exercise prescribed. Various strength tests, and measurements are given; the heart, lungs, and eyes are examined, and the utmost caution used in the advice regarding individual exercise. One examination during each semester is required, the latter demonstrating any improvement or change in the student's physical condition. Anthropometric cards and charts are platted for students when desired.

Systematic class work in gymnastics is required on two days of the week, of all freshmen, sophomores, and special students ranking with these classes. This work consists of vigorous drill with dumb-bells, clubs, bar-bells, etc., besides progressive graded work on the various pieces of gymnastic apparatus, always under the careful direction of competent instructors.

In the scheme of gymnastics, such exercises as are promotive of health, grace, and self-control, are sought for rather than heavy and dangerous athletic performances.

Every facility is provided for track-athletics, base-ball, football, tennis, aquatics, etc. The Lower Campus, directly in front of the gymnasium, furnishes a large, level area for the practice

of all athletic sports. In addition, the University owns the large tract known as Camp Randall, which is fitted up with a large grand stand, a $\frac{1}{4}$ -mile track, and other necessary features.

The University is situated on the shores of Lake Mendota, a beautiful sheet of water, which invites exercise and recreation in boating. The University Boat House Association has erected a boat house at a cost of over \$4,000.

During the second semester, a course of lectures on personal hygiene, health culture, etc., is given to the freshman class, illustrated by various physical charts and other apparatus. Attendance at these lectures is required of all freshmen.

Gymnastics for Women.

Ladies' Hall contains a finely equipped gymnasium for the use of the young women attending the University. This room is two stories high, has a floor space of 71x40 feet, and is provided with 27 dressing rooms, and 128 lockers. The dressing rooms connect with shower baths supplied with hot and cold water, furnishing ample bathing facilities for those who take gymnastics.

The apparatus is complete, and varied, consisting of chest weights, dumb-bells, wands, bar-bells, etc., besides a complete outfit of Swedish apparatus, and other forms of appliance for development and physical improvement. Music is used in all class drills. The first object of the training for women is of maintaining and conserving the health, and incidentally there are derived benefits of a very valuable character, such as the acquirement of grace, muscular control, self-reliance, and strength.

Each student will undergo a careful physical examination on entering the department, in order that the physical condition may be known, and suitable exercise prescribed for individual cases. A second examination is given during the second semester, in order that the improvements and benefits of the course of exercise may be shown.

The work is required of all freshman and sophomore students, and all special students ranking with them. Excuse may be granted from the required work on account of physical disability.

The Tennis and Cycling Clubs afford ample opportunity for out-door exercise and recreation, when the season and weather permit. Games, such as basket-ball, newcombe, basquette, etc., are practiced indoors during the winter season, and several teams organized for work in these games.

SCHOOL OF ECONOMICS, POLITICAL SCIENCE, AND HISTORY.

STAFF OF INSTRUCTION.

- C. K. ADAMS, LL. D., President of the University.
R. T. ELY, Ph. D., LL. D., Director, and Professor of Political Economy.
C. H. HASKINS, Ph. D., Professor of Institutional History.
J. B. PARKINSON, A. M., Professor of Constitutional and International Law.
W. A. SCOTT, Ph. D., Professor of Economic History and Theory.
F. J. TURNER, Ph. D., Professor of American History.
VICTOR COFFIN, Ph. D., Assistant Professor of European History.
F. C. SHARP, Ph. D., Assistant Professor of Philosophy.
E. D. JONES, Ph. D., Instructor in Economics and Statistics.
O. G. LIBBEY, Ph. D., Instructor in History.
B. H. MEYER, Ph. D., Instructor in Sociology.
P. S. REINSCH, A. B., LL. B., Instructor in Political Science.
S. E. SPARLING, Ph. D., Assistant in Public Administration.
W. CUNNINGHAM, D. D., LL. D., Lecturer on English Economic History.
W. P. TRENT, Ph. D., Special Lecturer on History.
H. C. TAYLOR, M. S. A., Fellow in Economics.
L. M. WARD, B. L., Fellow in History.
JENNY C. WATTS, M. A., Fellow in History.

GENERAL STATEMENT.

The purpose of the school is to afford superior means for systematic and thorough study in economics, political and social science, and history. The courses are graded and arranged so as to meet the wants of students in the various stages of their progress, beginning with elementary and proceeding to the most advanced work. They are also designed to meet the needs of different classes of students; as, for instance, those who wish to

enter the public service, the professions of law, journalism, the ministry or teaching, and those who wish to supplement their legal, theological, or other professional studies with courses in economics, social science, or history. Capable students are encouraged to undertake original investigations, and assistance is given them in the prosecution of such work through seminars and the personal guidance of instructors. A means for the publication of the results of investigations of merit and importance is provided in the University Bulletins, p. 33.

Courses in other departments may be advantageously combined with those offered in the school. Especial attention is called to the large number of related courses in philosophy and ethics.

The work of the School consists of the following departments:

1. Graduate Seminaries and Classes. These are open to graduates of colleges of good standing who have had the necessary preliminary studies. Graduate students whose training has been defective will be required to make up deficiencies by work in the prerequisite undergraduate courses.

2. The Civic Historical Course. This is designed to afford a liberal course of undergraduate training with emphasis upon the studies especially adapted to the promotion of good citizenship. It is parallel to the other four-year undergraduate courses of the University and leads to the degree of Bachelor of Letters. Students are admitted by examination or after graduation from an accredited school; the requirements for entrance are stated on page 63. The requirements for graduation in the course are stated on page 78.

3. Courses in economics, political science, and history offered to students in other departments. The various classes in the School are open to all properly qualified students of the University. In the College of Letters and Science students in the Ancient Classical and Modern Classical courses are required to take course 1 in history during the freshman year, and courses 1 and 2 are required of freshmen in the English course; the other studies of the School are elective, and count toward graduation on the same basis as the work of other departments. Course 5 in economics is part of the required work in the Short Course in Agriculture. Several courses in the school are peculiarly suited to the needs of students in the College of Law, and may be taken to advantage in connection with their professional studies.

4. Besides the regular courses of instruction enumerated below there is an Historical and Political Science Association, composed of students of this School.

Candidates for the degree of Doctor of Philosophy in this School are required to present in their principal subject the equivalent of at least two full graduate courses during two years, in their first subordinate the equivalent of at least one such course during two years, and in their second subordinate the equivalent of at least one such course.

Candidates for the master's degree must present in their principal subject the equivalent of at least two full graduate courses during one year, and in their subordinate subject the equivalent of at least one such course.

The other requirements for the master's and doctor's degree may be found on pages 54-55.

The courses of study offered in this school are described under the head of Economics and Statistics (page 86), Sociology (page 90), Political Science (page 91), and History (page 94).

THE SCHOOL OF EDUCATION.

The School of Education at present embraces three separate organizations:

- I. The School of Education proper, composed of the departments of Pedagogy and Philosophy.
- II. The University Extension Department.
- III. The Wisconsin Summer School and the Summer School of Library Science.

I. THE SCHOOL OF EDUCATION.

Staff of Instruction.

- C. K. ADAMS, LL. D., President of the University.
J. W. STEARNS, LL. D., Director and Professor of Philosophy and Pedagogy.
M. V. O'SHEA, B. L., Professor of the Science and Art of Teaching.
JOSEPH JASTROW,* Ph. D., Professor of Experimental and Comparative Psychology.
F. C. SHARP, Ph. D., Assistant Professor of Philosophy.
L. M. SOLOMONS, Ph. D., Instructor in Psychology.
B. H. MEYER, Ph. D., Instructor in Sociology and University Extension Lecturer in Economics.
W. B. LANE, A. M., Fellow in Philosophy.

GENERAL STATEMENT.

This School aims to afford practical and helpful instruction to students who wish to prepare themselves for teaching in public schools and colleges; to those who wish to become school principals and school superintendents; and to those who desire to pursue studies and investigations in the science of education. Persons looking forward to the professions of journalism, law, or the ministry, will find in some of the courses instruction

*On leave of absence in Europe.

adapted to their needs; while the history and general principles of education form a valuable addition to the courses for general culture. The four main lines of instruction in pedagogy are the history, the philosophy, the science, and the practice of education, all of which present extensive fields for investigation. The history of education very properly occupies a place in courses for general culture, as an important and practical branch of the history of civilization, and it also affords the best introduction to the problems of pedagogy. The science of education is closely connected with philosophy, and especially with psychology in its modern physiological and comparative forms. Beyond the courses which are outlined below, ample opportunity will be given for the study of special problems in the laboratory and in the school room. The seminars will afford opportunities for critical discussion of teaching work, and of educational problems, and will acquaint the student with the most important current literature of education.

The work of the School naturally falls into the following divisions:

I. Classes for undergraduate students of the university as part of general culture courses. For this purpose courses 1, 5, 10, and 11, in pedagogy, are specially suited.

II. Courses for undergraduate students who wish to prepare themselves for teaching in the public schools. Those in regular courses of the University who complete satisfactorily at least twelve (12) unit-hours in philosophy and pedagogy will be entitled to a certificate from the School of Education. Students who desire this certificate may select their work from the following: In philosophy, one course, either 1, 2, 3, or 15. In pedagogy, course 1, and two of the following: 6, 8, 9, 12, 14. In addition candidates will take teachers' courses in the branches in which they expect to teach.

III. Courses for students specializing in education. Those who expect to take their first degree in the educational group are required (1) to pursue work in the department to the extent of one full study for two years; (2) to prepare a thesis in this department. The courses adapted to serve as introductory to the study of education are: In philosophy, courses 1, 2, 3, and 15; in pedagogy, courses 1, 6, 8, 9, and 11.

IV. For Normal school graduates the Philosophical Course of two years, looking to a more advanced and extended study of

the theory and practice of education, has been outlined as follows:

Junior year: Latin, French, or German 4; philosophy 3; advanced pedagogy 3; language, history, English, advanced mathematics, or science 5; electives 3 to 5; *18 hours per week required.*

Senior year: Continuation of Latin, French, or German 4; philosophy and advanced pedagogy 5; electives from language, science, history, economics, mathematics, or English 7; and thesis; *18 hours per week.*

V. Graduate students, and those looking to the supervision of large schools or school systems, and to the detailed study of educational problems, will find work suited to their needs in the seminaries and advanced courses of the school.

An account of the courses offered in Philosophy and Pedagogy will be found on pages 82-86. Teachers' courses are offered in other departments, and are described under the appropriate heads. Among these courses are Latin 6, p. 102; German 13, p. 109; botany 19, p. 130; history 16, p. 96; English grammar 23, p. 113. See also the courses announced for teachers in the Summer Session of the University on subsequent pages.

UNIVERSITY EXTENSION DEPARTMENT.

Staff.

- CHARLES KENDALL ADAMS, LL. D., President of the University.
J. W. STEARNS, LL. D., Director and Professor of Philosophy and Pedagogy.
B. H. MEYER, Ph. D., Secretary, Lecturer on Economics, and Instructor in Sociology.
A. A. BRUCE, A. B., LL. D., Assistant Professor of Law.
E. R. BUCKLEY, Ph. D., Geologist, Geological and Natural History Survey.
G. C. COMSTOCK, Ph. B., LL. B., Professor of Astronomy.
J. C. FREEMAN, LL. D., Professor of English Literature.
W. F. GIESE, A. M., Assistant Professor of Romance Languages.
E. D. JONES, Ph. D., Instructor in Statistics and Economics.
LOUIS KAHLENBERG, Ph. D., Assistant Professor of Physical Chemistry.
M. V. O'SHEA, B. L., Professor of the Science and Art of Education.
J. F. A. PYRE, Ph. D., Instructor in English Literature.
P. S. REINSCH, Ph. D., Instructor in History and Political Science.
H. L. RUSSELL, Ph. D., Professor of Bacteriology, and Bacteriologist to the Experiment Station.
F. C. SHARP, Ph. D., Assistant Professor of Philosophy.
C. F. SMITH, Ph. D., Professor of Greek and Classical Philology.
S. E. SPARLING, Ph. D., Assistant in Political Science.
R. G. THWAITES, Superintendent and Secretary of the State Historical Society of Wisconsin.
R. H. TRUE, Ph. D., Assistant Professor of Pharmacognosy.

GENERAL INFORMATION.

The University Extension Department of the University of Wisconsin, as at present organized, carries on its work of giving instruction at a distance from the University in two ways: first, by courses of lectures delivered in person by University instructors; and, second, by individual instruction by correspondence.

I. UNIVERSITY EXTENSION LECTURES.

University Extension lectures are lectures delivered by university professors and instructors on subjects which they treat in their regular classes.

Under the system adopted by the University of Wisconsin, the University Extension lectures are delivered only in courses of six lectures. The purpose of delivering the lectures in courses is to concentrate attention upon one subject.

A printed syllabus, free to each student, will give an epitome of the subject considered, an analysis of each lecture, references to the best books on the subject, and other helpful suggestions.

The class, which is held before or after each lecture, furnishes the student an opportunity to question the lecturer and to have special difficulties explained. In the class, the lecturer will take the opportunity to elaborate his subject or to emphasize its salient features.

The lecturer will hold at the end of the course a written examination which may be taken only by those who have attended the lectures and classes, read the required books and sent in the required papers. To such as comply with these requirements and pass the examination the University of Wisconsin will award a certificate, having a recognized value on the University records and credited accordingly, should the holder ever study at the University.

EXPENSES.

The expenses of a course consist of local expenses and the charges of the University. Under the former head are included hall rent, printing, advertising, etc., which are managed by the local center, and which vary, of course, in different towns and circumstances. Often a church or school hall may be obtained for the lectures without expense.

The charges of the University consist of:

1. A fee of \$100 for a course of six lectures.
2. The lecturer's traveling expenses, including sleeping-car and meals, when necessary. By special arrangement with the railways, the lecturer's railroad fare is only two cents a mile. In the case of a circuit, the lecturer's traveling expenses are divided equally between the centers forming the circuit.
3. The lecturer's hotel bill. Where the lecturer is entertained by members of the local center, this item disappears.
4. If lantern illustrations are given, the actual cost will be paid by the local center.

COURSES OF LECTURES.

The following is the program of courses for 1899-1900:

Professor M. V. O'SHEA: Applied Psychology and Child-Study.

Professor FRANK C. SHARP: Problems of Moral Progress.

Dr. B. H. MEYER: An Introduction to Economic Problems; Some Leading Economists.

Professor ANDREW A. BRUCE: Society and the Law-Maker.

Dr. EDWARD D. JONES: Charity and Crime.

Dr. SAMUEL E. SPARLING: The Modern City and its Problems; American Political Parties and their Relation to Government.

Dr. PAUL S. REINSCH: The Constitution and the Founding of the Federal Government; The Statesmen of the Civil War; Contemporary World Politics; Historic Towns and Sites of Italy.

Mr. REUBEN G. THWAITES: Men and Manners in Old Colonial Days; Exploration and Conquest of the West; The Making of Wisconsin.

Professor JOHN C. FREEMAN: English Life and Literature; Studies in Shakespeare; Great Epics of the World.

Dr. JAMES F. A. PYRE: American Writers and American Culture; Typical English Poems.

Professor WM. F. GIESE: The French Classic Poets; The Skeptical Movement in French Literature from the Renaissance to the 19th Century.

Professor CHARLES F. SMITH: Greek Life; Greek Literature.

Professor GEORGE C. COMSTOCK: Astronomy.

Dr. ERNEST R. BUCKLEY: Geographic Geology; Economic Geology with Special Reference to Wisconsin.

Professor HARRY L. RUSSELL: Microbes and their Work.

Professor LOUIS KAHLENBERG: Chemistry.

II. INSTRUCTION BY CORRESPONDENCE.

It should be clearly understood that instruction by correspondence is by no means regarded as the equivalent of resident study. It is not so valuable to the student. Experience has shown, however, that earnest students may do good work at a distance from the University when guided by competent instruction by correspondence. There are in every locality teachers, ministers, and men and women of various vocations, who are carrying on the study of certain subjects alone, and who would be glad to avail themselves of the guidance of a University instructor. There

are others who would take up and prosecute some line of study if they could have competent guidance, but who do not feel able to carry on any study without guidance. Some are looking forward to a college course and would like to prepare themselves for admission; others would like to do a part of the college work in absence, thereby shortening the time of residence required for a course. For these various classes of persons and all others who desire to receive guidance in some line of study by correspondence, whether with a view to receiving University credit or not, the University of Wisconsin offers instruction by correspondence.

The instruction by correspondence is of two kinds, formal and informal.

The formal instruction is carried on by a series of printed instruction and question sheets. In the case of a five-fifths study, the entire course consists of forty of these instruction sheets. Each sheet assigns the student certain work, gives suggestions and explanations and a series of questions, the answers to which the student is to write out after having performed the work assigned. The answers to these questions the student is to mail to the University with any questions or difficulties which have arisen in his mind. This recitation paper will be returned to the student with errors corrected and whatever suggestions the instructor may think necessary.

The instruction by informal correspondence is mainly designed for advanced students. In this work the particular needs of the student are taken into consideration, and his work is arranged to suit his individual needs and abilities. The instructor carefully outlines the course which the student is to pursue, and satisfactory evidence is given in some way that the student is doing the work properly. In this informal instruction by correspondence the instructor may require several essays or a thesis, or he may be satisfied by his regular correspondence with the student.

Only a few of the courses offered at the University are as yet offered by correspondence. Among these are courses in history, literature, political science, mathematics, and other branches.

Students may begin any course at any time.

If a period of sixty days elapses without any report from a correspondence student, he will be deemed to have dropped the course and will forfeit his right to further instruction.

UNIVERSITY CREDIT FOR WORK DONE BY CORRESPONDENCE.

1. When a student has completed any course of study by correspondence satisfactorily to the instructor, he will be given a certificate for the work done.

2. If he desires this work to be credited on the books of the University towards a degree, he must pass the regular examination for admission to one of the regular courses of the University prescribed in the University catalogue for all students. He must then pass a special examination at the University on the work done by correspondence for which he wishes credit. In rare and exceptional cases this special examination may be conducted at the student's home by some one from the University or authorized by the University.

3. For the Bachelor's and Master's degree not more than one-half of the required work may be performed by correspondence.

4. For the Doctor's degree not more than one-third of the required work may be performed by correspondence.

The University grants no degrees for work done entirely by correspondence or in absence.

For the degrees of B. A., B. S., and B. L., at least two years of resident study is required.

For the degrees M. A., M. S., and M. L., at least one semester of resident study is required.

For the degree of Ph. D. at least two years of resident study is required, one year of which must be spent at the University of Wisconsin.

EXPENSES.

The instruction fees are as follows:

For a five-fifths study (forty lessons), \$10.

For a four-fifths study (thirty-two lessons), \$8.

For a three-fifths study (twenty-four lessons), \$6.

For a two-fifths study (sixteen lessons), \$4.

For a one-fifth study (eight lessons), \$2.

These fees include the payment for printed lesson sheets, but the student is required to enclose postage with each recitation paper for its return when corrected by the instructor.

All fees are payable in advance.

For further information, address

UNIVERSITY EXTENSION DEPARTMENT,

Madison, Wis.

WISCONSIN SUMMER SCHOOL.

SESSION OF 1899.

J. W. STEARNS, LL. D., Director of School.

The twelfth annual session of the Summer School will extend from July 3, to Aug. 11, 1899.

The work of the Summer School is consolidated with that of the University. The courses of study formerly given in the Summer School are included in the summer session and will be found announced under the appropriate departments of study on preceding pages. The terms of admission to the School remain as heretofore and the fee is the same as that for the summer session of the University, as stated on page 152. The Summer School courses will be found adapted, as heretofore, to recent high school graduates who intend to enter the University; to University and college students who expect to teach and desire to review the studies which they will be called upon to teach; to teachers who wish to study the principles of teaching and still further prepare themselves in the branches in which they are giving instruction; to principals and superintendents who desire aid to the better understanding of the theory and practice of their work. Persons who intend to take the state examinations for teachers will also find means of completing their preparation. The attention of all such persons is especially directed to courses 1 to 4 in philosophy and pedagogy; 1 and 7 in history; 1 and 2 in Latin; 7, 8 and 9 in German; 8 and 9 in English; 1 and 2 in mathematics; 7 in physics; 1 and 2 in chemistry; 1 in geology; 1 and 1a in zoology; 5 in botany; 1 in bacteriology; and 1, 2, and 3 in drawing.

THE SUMMER SESSION.

STAFF OF INSTRUCTION.

- C. K. ADAMS, LL. D., President of the University.
E. A. BIRGE, Ph. D., Sc. D., Director of the Summer Session,
Professor of Zoology.
L. W. AUSTIN, Ph. D., Assistant Professor of Physics.
F. E. BOLTON, Ph. D., Professor of Pedagogy, Milwaukee Normal
School.
L. S. CHENEY, M. S., Assistant Professor of Pharmaceutical Bot-
any.
VICTOR COFFIN, Ph. D., Assistant Professor of European History.
G. C. COMSTOCK, Ph. B., LL. B., Professor of Astronomy and
Director of the Washburn Observatory.
WILLIAM CUNNINGHAM, D. D., LL. D., Fellow and Lecturer on
Political Economy in Trinity College, Cambridge, England.
W. W. DANIELLS, M. S., Sc. D., Professor of Chemistry.
J. C. ELSOM, M. D., Professor of Physical Culture and Director
of the Gymnasium.
R. T. ELY, Ph. D., LL. D., Director of the School of Economics,
Political Science, and History, and Professor of Political
Economy.
J. C. FREEMAN, LL. D., Professor of English Literature.
C. H. HASKINS, Ph. D., Professor of Institutional History.
LOUIS KAHLENBERG, Ph. D., Assistant Professor of Physical
Chemistry.
A. A. KNOWLTON, A. M., Assistant Professor of English.
H. B. KÜMMEL, Ph. D., Professor of Geography and Geology,
Lewis Institute.
JESSE MACY, A. M., Professor of Constitutional History, Iowa
College.
W. S. MILLER, M. D., Assistant Professor of Vertebrate Anatomy.
E. T. OWEN, A. B., Professor of French Language and Literature.
J. B. PARKINSON, A. M., Professor of Constitutional and Inter-
national Law.
W. H. ROSENSTENGEL, A. M., Professor of the German Language
and Literature.

- F. C. SHARP, Ph. D., Assistant Professor of Philosophy.
 M. S. SLAUGHTER, Ph. D., Professor of Latin.
 C. S. SLICHTER, M. S., Professor of Applied Mathematics.
 C. F. SMITH, Ph. D., Professor of Greek and Classical Philology.
 W. M. SMITH, A. B., Librarian.
 B. W. SNOW, Ph. D., Professor of Physics.
 H. A. SOBER, A. B., Assistant Professor of Latin.
 J. W. STEARNS, LL. D., Director of the Summer School. Professor of Philosophy and Pedagogy.
 MARY E. TANNER, Professor of Drawing, Stevens Point Normal School.
 R. G. THWAITES, Secretary of the State Historical Society of Wisconsin.
 C. R. VAN HISE, Ph. D., Professor of Geology.
 C. A. VAN VELZER, Ph. D., Professor of Mathematics.
 E. K. J. VOSS, Ph. D., Assistant Professor of German Philology.
 ARTHUR BEATTY, Ph. D., Instructor in English.
 J. B. BROWDER, Ph. D., Instructor in Greek.
 J. E. DAVIES, B. L., Student Assistant in Gymnastics.
 W. D. FROST, M. S., Instructor in Bacteriology.
 LUCY M. GAY, B. L., Instructor in French.
 SALLY P. HARRIS, Assistant in Physical Culture.
 G. S. ISHIKAWA, Student Assistant in Gymnastics.
 F. W. MEISNEST, B. S., Instructor in German.
 B. H. MEYER, Ph. D., Instructor in Sociology and Economics.
 A. R. PRIEST, M. A., Instructor in Elocution.
 J. F. A. PYRE, Ph. D., Instructor in English Literature.
 P. S. REINSCH, LL. B., Ph. D., Instructor in Political Science.
 THEODORE RUNNING, M. S., Assistant in Mathematics.
 C. M. SMITH, B. S., Instructor in Physics.
 E. F. RILEY, Secretary of the Board of Regents.
 W. D. HIESTAND, University Registrar.

GENERAL STATEMENT.

The first summer session of the University of Wisconsin will continue for six weeks, beginning Monday, July 3, and closing Friday, Aug. 11, 1899. While the summer session of the University will include the Summer School for Teachers, which has been in operation for some years, it is not an enlargement of that school, but has a different purpose, providing elementary, advanced, and graduate instruction throughout the range of subjects ordinarily covered by the Faculty of Letters and Science.

TERMS OF ADMISSION.

The requirements for admission are the same for the summer session as for the other sessions of the University, see pp. 59-65. Graduates of the University of Wisconsin or other colleges and universities of good standing are admitted to graduate courses without examination. Undergraduate students are admitted as follows, on the terms referred to:

Persons over twenty-one years of age may be admitted without examination as adult special students not candidates for a degree.

Teachers will be admitted to the studies of the summer session without examination. If they desire university credit for work done they must matriculate regularly before the studies can be credited.

Students will be admitted to the elementary courses of the Summer School without special examination. They will also be admitted to University courses for which they are qualified but University credit will be given only to students who have satisfied the regular entrance requirements of the University.

FEES.

The fees for the summer session of the University and the Summer School are the same. A general fee of ten dollars will be charged, which will entitle the student to take studies amounting to ten hours per week. Five dollars additional will be charged for each additional five hours or fraction thereof.

DEPARTMENTS OF STUDY.

The statement of courses below gives in detail the work offered in the various departments for the summer of 1899, together with the credit to which students are entitled on the completion of each course. Credits are stated in fractions of a "full study," by which is meant a study consisting of five class exercises a week for one semester. The total amount of credit which a student may receive for the six weeks' work can not exceed six-fifths for one semester.

Candidates for the Master's or Doctor's degree will receive credit for work done in the summer session on the same terms as for study during the regular sessions of the University.

PHILOSOPHY AND PEDAGOGY.

PROFESSOR STEARNS, ASSISTANT PROFESSOR SHARP, AND PROFESSOR BOLTON.

1. General Psychology. The course will have especially in view the theory of teaching, and will therefore be directed to those topics which bear most closely upon pedagogy. Murray's Handbook of Psychology is especially recommended to those intending to take this course. *Five hours a week.* Professor STEARNS. Two-fifths credit.
2. History of Educational Theories. The course will follow as a guide Quick's Essays on Education. *Five hours a week.* Professor BOLTON. Two-fifths credit.
3. School Supervision. The course will aim to familiarize those in attendance with the best literature of the subject and the present practices and views, and to show how to find and investigate the problems and needs of the schools. *Five hours a week.* Professor STEARNS. Two-fifths credit.
4. Technique of High School Instruction. *Five times a week.* Professor BOLTON. Two-fifths credit.
5. Systematic Ethics. A study of the most important phenomena and problems of the moral life. *M., Tu., W., Th., F., S., at 8.* Assistant Professor SHARP. Three-fifths credit.
6. English Philosophy. Berkeley's doctrine of the nature of the external world as presented in his Principles of Human Knowledge. *M., W., F., at 9.* Assistant Professor SHARP. One-fifth credit.
7. Seminary in Psychology. The subject of study will be the will. Animal and human instincts; suggestion and imitation in their various forms; mob actions; habit; voluntary action; the education of the will. Open to students who have had a course in introductory psychology. *Tu., Th., from 4 to 6.* Assistant Professor SHARP. One-fifth credit.

ECONOMICS AND SOCIOLOGY.

PROFESSOR ELY, PROFESSOR CUNNINGHAM, AND DR. MEYER.

1. The Elements of Economic Science. Text: Ely's Outlines of Economics (college edition). Eight hours per week. *M., Tu., Th., F., 8 to 10.* Dr. MEYER. Three-fifths credit.

2. History of Economic Thought. This course is designed for undergraduates who have had the elementary work in economics, and for graduates who have not had a course in the history of economic thought. *M., Tu., W., Th., at 10.* Professor ELY. Two-fifths credit.
3. The Elements of Sociology. Lectures and assigned readings. *Four hours per week, with special conferences. W., S., 8 to 10.* Dr. MEYER. Two-fifths credit.
4. English Economic History. Six lectures on English antiquities illustrated with lantern slides, and six lectures on the Industrial Revolution. *F., S., at 11.* Professor CUNNINGHAM. One-fifth credit.
5. The Distribution of Wealth. *M., Tu., W., Th., at 11.* Open to graduate students and undergraduates who have had suitable preparation. Professor ELY. Two-fifths credit.
6. Economic Seminary. This is designed primarily for advanced students who wish to carry on special investigations under the guidance which the department affords. Each student, with the consent of the instructors, may select a topic for investigation for himself, or one may be assigned him connected with the subject selected for the main seminary work. The subject for the summer of 1899 is: Problems of Public Expenditure and Revenue. A subordinate feature of the seminary work is the review of recent books and important articles published in the periodicals. *M., 3 to 5.* Professor ELY and Dr. MEYER.

POLITICAL SCIENCE.

PROFESSOR PARKINSON AND DR. REINSCH.

1. Constitutional Law. Lectures upon the English constitution with emphasis upon its unwritten growth since the Revolution of 1688. *Twice a week.* Professor PARKINSON. One-fifth credit.
2. Constitutional Law. A study of the constitution of the United States. *Five times a week.* Professor PARKINSON. Two-fifths credit.
3. International Law. *Three times a week.* Professor PARKINSON. One-fifth credit.

4. Political Philosophy. A study of the greatest classics of political thought, tracing the development of the idea of state from the Greeks down to the present century. *M., Tu., W., Th., at 8.* Dr. REINSCH. Two-fifths credit.
5. Elements of Law. A course on the terminology and leading principles of jurisprudence, with special reference to the common law. *M., Tu., W., Th., at 10.* Dr. REINSCH. Two-fifths credit.

HISTORY.

PROFESSOR HASKINS, PROFESSOR MACY, MR. THWAITES, ASSISTANT PROFESSOR COFFIN, AND DR. REINSCH.

1. Roman History. A general survey, with special reference to the needs of teachers of ancient history in secondary schools. *M., Tu., W., Th., F., at 10.* Open to all students, but designed especially for those in the Summer School. Professor HASKINS. Two-fifths credit.
2. Constitutional History of England. A rapid review of the institutions of the Anglo-Saxons, followed by a more careful study of the period between the Norman Conquest and the Great Charter. *M., Tu., W., Th., at 11.* Designed for advanced students, and open only to those who have had a general course in English history. Professor HASKINS. Two-fifths credit.
3. Historical Method and Criticism. This course is designed as an introduction to historical research, and deals with the general problems involved in the collection of historical material, the criticism of sources and the processes of historical construction. Langlois and Seignobos' *Introduction to the Study of History* is used as a guide, and the work is made as concrete as possible. *Tu., Th., at 12.* For graduate students. Professor HASKINS. One-fifth credit.
4. Modern European History. An introductory course; from the Reformation to the French Revolution. *Five hours weekly.* Open to all students. Assistant Professor COFFIN. Two-fifths credit.
5. The Struggle of France and England in North America. The course will deal with the colonial contest for the continent and will provide opportunity for investigation in connection with special periods. *Four hours weekly.* Secretary THWAITES. Two-fifths credit.

6. History of American Political Parties. A course of lectures on the development and machinery of the principal political parties of the United States. Opportunity for investigation is offered in connection with this course. *Three hours weekly.* Professor MACY. Two-fifths credit.
7. American History, 1780-1830. An elementary survey, open to all students, but designed especially for those in the Summer School. *Five hours weekly.* Dr. REINSCH. Two-fifths credit.
8. Seminary in American History. A course to afford training in original research. The study will be upon the subject of the relations between the United States and Canada in the period of the American Revolution. *Three hours weekly.* Assistant Professor COFFIN. One-fifth credit.
9. Historical Conference. One hour weekly will be devoted to an informal conference with graduate students at which reports will be made upon individual investigations and current historical literature will be discussed. *F., at 11.* Professor HASKINS.

GREEK.

PROFESSOR SMITH AND DR. BROWDER.

1. Homer's Odyssey. The instruction presupposes such knowledge of Greek as is required for entrance to the Freshman class. Especial attention will be given to the reading of the verse and to the literary treatment of the author. *Daily, at 9.* Dr. BROWDER. Two-fifths credit.
2. Plato. Apology and Crito. Intended for students of the grade of Sophomore. *M., Tu., W., Th., F., at 10.* Dr. BROWDER. Two-fifths credit.
3. Euripides. Rapid reading course. Especial attention will be given by the instructor to the reading of the Greek verse. The course is intended for students above the Freshman grade. *M., W., F., at 10.* Professor SMITH. One-fifth credit.
4. Thucydides VI. and VII., or (should the class prefer it) the *Oedipus Tyrannus* of Sophocles and the *Frogs* of Aristophanes. Equivalent to a Junior or Senior elective; open also to graduates. *M., Tu., W., Th., F., at 9.* Professor SMITH. Two-fifths credit.

5. Greek Seminary. Thucydides II. The members lead in turn with carefully prepared papers embodying critical discussions of assigned portions of the text, interpretations, investigation of special topics, etc. Intended for graduates. The library affords especially good facilities for research work in connection with this course. *F.*, 10 to 12. Professor SMITH. Two-fifths credit.
 6. Lectures on the Life of the Ancient Greeks, illustrated by means of lantern slides. *Probably at 5 P. M., twice a week.* A knowledge of Greek is not required for this course. Professor SMITH. One-fifth credit.
- Should there be sufficient demand for it, an elementary course may be arranged especially for teachers who may know only a little Greek, but wish instruction with a view to future study of the subject. Teachers are invited to write to the head of the department with reference to such instruction.

LATIN.

PROFESSOR SLAUGHTER AND ASSISTANT PROFESSOR SOBER.

Elementary and Practice Courses.

1. Caesar. This course will deal with the methods of Latin instruction in secondary schools. Attention will be paid to difficulties of syntax, the Roman pronunciation, and other problems of Latin teaching. *M., Tu., W., Th., F., at 8.* Assistant Professor SOBER. Two-fifths credit.
2. Vergil, Aeneid I-VI. This course will consist in reading the Latin and translating the text with literary, historical, and mythological comments. Intended primarily for teachers. *M., Tu., W., Th., F., at 9.* Professor SLAUGHTER. Two-fifths credit.

Rapid Reading Courses.

3. A reading course in easy prose authors selected to suit the desires of the class will be given twice weekly. *S.*, 8-10. Assistant Professor SOBER. One-fifth credit.
4. A rapid reading course in Vergil, selections from the Eclogues, Georgics, and Aeneid VII-XII. This course should be taken by those who take course 2. *Daily at 10.* Professor SLAUGHTER. Two-fifths credit.

Lectures and Seminary Courses.

5. Topography and Remains of Ancient Rome. Six lectures. *Tu., at 5.* Assistant Professor SOBER.

6. Private Life of the Romans. Six lectures. *Th., at 5.* Professor SLAUGHTER.

The lectures of courses 5 and 6 will be illustrated by photographs and lantern slides. A knowledge of Latin is not necessary for these courses, which are open to any person who may choose to attend. For courses 5 and 6 together, one-fifth credit.

7. Seminary. A syntactical seminary will be conducted. Certain problems in Latin syntax will be discussed, and reports will be required of the members. *M., W., F., at 8.* Professor SLAUGHTER. Two-fifths credit.

FRENCH.

PROFESSOR OWEN AND MISS GAY.

1. Grammar (mainly). Otto's French Conversation Grammar; Roman d' un Jeune Homme Pauvre. *Daily, at 8 and 9.* Miss GAY. Four-fifths credit.
2. Translation. La Petite Fadette; Le Cid. *M., W., F., at 10 and 11.* Professor OWEN. For credit see below.
3. Readings. Andromaque; Le Bourgeois Gentilhomme. *Tu., Th., at 10, Th., at 5.* Miss GAY. Courses 2 and 3 taken together entitle to a four-fifths credit.
4. Lectures on Thought and Language topics. *M., at 12.* Professor OWEN. An introduction to the field more fully examined in the first semester.

GERMAN.

PROFESSOR ROSENSTENGEL, ASSISTANT PROFESSOR VOSS, AND MR. MEISNEST.

1. Grammar and Reader. For beginners, ten hours weekly. Mr. MEISNEST. Five-fifths credit.
2. Science Reader and Scientific Monographs. *Five hours of class work weekly and assigned private reading.* Mr. MEISNEST. If a sufficient amount of work is satisfactorily completed, a credit will be given of four-fifths, corresponding to the first semester of the General Science and Engineering courses.

3. Conversation, Composition, and Translation. Professor ROSENSTENGEL. Two-fifths credit.
 4. Schiller's and Goethe's Dramas. Interpretation and critical study of the most important dramas. Lectures (in German). The students will read the dramas and leading criticisms privately, and report to the class on assigned topics. Professor ROSENSTENGEL. Two-fifths credit.
 5. An introduction to the study of German from an historical and comparative point of view. Lectures and recitations. Text-books: Weise, *Unsere Muttersprache*, and Meyer. *Einführung in das ältere Neuhoehdeutsche*. *Three hours a week*. Assistant Professor Voss. One-fifth credit.
 6. Elementary Middle High German. Paul's *Mittelhochdeutsche Grammatik* and extracts from the *Nibelungenlied*, with lectures on the *Volksepos*. *Three hours a week*. Assistant Professor Voss. One-fifth credit.
- These courses are planned especially to meet the needs of teachers of German in high schools.
7. Narrative and Historical German Prose. A rapid reading course with review of grammar. The texts will be selected from the modern writers of fiction and history. *Three hours a week*. Assistant Professor Voss. One-fifth credit.
 8. A course in German composition, conversation, and grammar review. For students who have had a year of German or more. *Three hours a week*. Assistant Professor Voss. One-fifth credit.
 9. Masterpieces of German Literature. *Three hours a week*. Assistant Professor Voss. One-fifth credit.

ENGLISH.

PROFESSOR FREEMAN, ASSISTANT PROFESSOR KNOWLTON, DR. PYRE, AND
DR. BEATTY.

1. Study of Prose Style. Composition. Exercises, themes, conferences with individual students for criticism of written work. *Ten hours a week*. Assistant Professor KNOWLTON.
- This course is equivalent to the first semester's work of English, course 1, University catalogue. Three-fifths credit.

English Language.

2. Anglo-Saxon. This course is an introduction to the historical study of English. *Ten hours a week.* Dr. BEATTY. Three-fifths credit. (Corresponds to the work of the first semester in course 2 in the regular college course.)
3. History of the English Language. An elementary course which aims to give training to the methods of language study, and to show its bearing on literary questions. Text-book: Emerson's History of the English Language. *Three hours a week.* Dr. BEATTY. One-fifth credit.

English Literature.

4. General Survey of English Literature. Lectures on the history of literature, and study of representative masterpieces. *Ten hours a week.* Dr. PYRE. Three-fifths credit.
5. A Study of American Writers. Lectures on Colonial and revolutionary literature and direct study of classics of the national period. Selections will be made from Hawthorne, Lowell, Emerson, and Poe. *Three hours per week.* Dr. PYRE. One-fifth credit.
6. The Drama. Shakespeare's Macbeth and two other plays selected according to the wishes of the class. *Five times a week.* Professor FREEMAN. Two-fifths credit.
7. Lyric Poetry. Selections from Palgrave's Golden Treasury of English Lyrics, studied as to form of verse, substance, and style. *Five times a week.* Professor FREEMAN. Two-fifths credit.

Summer School courses without University credit:

8. Rhetoric and composition, with direct reference to the teaching of these subjects in high schools. *Four hours a week.* Assistant Professor KNOWLTON.
9. A study of English classics with direct reference to teaching. The following are likely to be taken up: Milton's Paradise Lost (Books I. and II.), Burke on Conciliation with America, Macaulay's Essays on Milton and Addison. *Five hours a week.* Professor FREEMAN.

ELOCUTION.

MR. PRIEST.

An elementary course in the principles of vocal expression and literary interpretation. The course will be designed to teach the art of effective reading and speaking, and will be especially adapted to the needs of teachers in secondary schools. *Daily, at hours to be fixed on consultation.* Credit depending on amount of work done.

MATHEMATICS.

PROFESSOR VAN VELZER, PROFESSOR SLICHTER, AND MR. RUNNING.

1. Algebra. Course in algebra planned with reference to the special needs of high school instructors and those who are preparing for examination. *Five times per week.* Professor SLICHTER. Three-fifths credit may be obtained by making up some additional work.
2. Geometry. A review of the important theorems in plane geometry, and a study of solid geometry. No previous knowledge of solid geometry will be required. *Five times a week.* Completion of this course satisfies the entrance requirement of geometry to the University. Mr. RUNNING.
3. Plane Trigonometry and Logarithms. No previous knowledge of the subject will be assumed, but plane geometry and algebra though quadratics are prerequisites to the course. *Five times a week.* Professor VAN VELZER. Two-fifths credit.
4. Analytic Geometry. (Elementary course.) *Five times a week.* Mr. RUNNING. Two-fifths credit.

Advanced Courses.

5. Calculus. Differentiation and integration of functions of one variable with geometric applications. *Five times a week.* Mr. RUNNING. Two-fifths credit.
6. Theoretical Mechanics. A course in analytical mechanics for students who have had the calculus. *Five times per week.* Professor SLICHTER. Two-fifths credit.
7. Theoretical Hydrodynamics. A course of reading on the motion of perfect fluids. The conference will be held

two or three times a week, and credit will be given on the basis of the work accomplished. Professor SLICHTER.

8. Theory of Equations. The properties of equations of the n th degree. Solution of cubic and biquadratic equations and numerical equations of higher degrees. *Five times a week.* Professor VAN VELZER. Two-fifths credit.
9. Differential Equations. Solution of differential equations of the first order with geometric applications. *Five times a week.* Professor VAN VELZER. Two-fifths credit.
10. Theory of Numbers. Elementary treatment of congruences, primitive roots, and quadratic forms. Lectures based on Dirichlet's *Zahlentheorie*. *Five times a week.* Professor VAN VELZER. Two-fifths credit.
11. Substitutions. Elementary treatment of substitutions and substitution groups. Lectures, based on Serret's *Algèbre Supérieure* and Netto's *Substitutions*. *Five times a week.* Professor VAN VELZER. Two-fifths credit.

Of the courses 9, 10, 11, only two will be given.

ASTRONOMY.

PROFESSOR COMSTOCK.

1. Descriptive Astronomy. Two exercises per week to be given to lectures and accompanying quiz, supplemented by one additional hour per week given upon clear nights to a direct study of the constellations, their diurnal motion, and other simple phenomena of the sky. Two-fifths credit.
2. Practical Astronomy. Given as a laboratory course ten hours per week. The use of astronomical instruments for the determination of latitude, azimuth, and time. A considerable part of the work of this course must be done in the evening hours. Two-fifths or three-fifths credit, depending upon the amount of work done.

PHYSICS.

PROFESSOR SNOW, ASSISTANT PROFESSOR AUSTIN, AND MR. SMITH.

1. General Lectures. *Daily, at 4.* Professor SNOW. One recitation by the class in small sections at hours to be arranged. Mr. SMITH.

In the summer sessions it is designed to complete in three years the year's work of course 1 in physics, p. 118, taking mechanics and heat during the summer of 1899, electricity and magnetism in 1900, and acoustics and optics in 1901. A knowledge of plane trigonometry is required for registration. Two-fifths credit.

2. Theoretical Physics. These lectures will vary from year to year, completing in four years the ground covered by courses 5 and 6, p. 119. In 1899, Mathematical Introduction and Mechanics will be given. *Five hours per week.* Assistant Professor AUSTIN. Two-fifths credit.
3. Introductory Laboratory Practice. This is the equivalent of the regular sophomore laboratory given during the rest of the year, and is designed to accompany course 1. *Twenty hours per week*; a smaller number of hours may be taken if desired. Assistant Professor AUSTIN and Mr. SMITH. One-fifth credit for each thirty hours of work performed.
4. Advanced Laboratory Practice. This course is the same as course 2, p. 119, and presupposes the completion of courses 1 and 3 mentioned above, or their equivalents. One-fifth credit for each thirty hours of work performed. *Twenty or thirty hours per week during the session.* Assistant Professor AUSTIN.
5. Thesis Work. The laboratory will be open to receive those who wish to complete a part or the whole of their thesis, course 3 of the general catalogue, during the summer. *Fifty hours per week during the session will be necessary to complete the course.*
6. Graduate Research. Every facility is offered for carrying on original investigation, special apparatus will be secured as required, and special rooms in the laboratory are set aside for their purpose. Professors SNOW and Assistant Professor AUSTIN.
Summer School course without University credit.
7. Lectures. A course of lectures will be given daily except Saturday upon the subjects of mechanics and heat, electricity and magnetism, acoustics, and optics. Carhart & Chute's Physics will be used as a text.

- 7a. Elementary Laboratory Practice. The completion of the above two courses will be accepted as the requirement in physics for entrance to the University.

CHEMISTRY.

PROFESSOR DANIELLS AND ASSISTANT PROFESSOR KAHLENBERG.

1. Inorganic Chemistry. A course of lectures illustrated by experiments, together with laboratory work. Professor DANIELLS.
2. Qualitative Analysis. A careful study of the reactions used in the detection and separation of inorganic bases and acids. Professor DANIELLS and Assistants. Courses 1 and 2 taken together give a three-fifths credit.
3. Quantitative Chemistry. (a) Work in determining the equivalence of elements. (b) Quantitative Analysis. This course includes both gravimetric and volumetric methods. Professor DANIELLS. Credit according to amount of work done.
4. Physical Chemistry. This course is for students that have had an elementary course in general chemistry, and is also adapted to teachers of physics and chemistry in high schools and colleges. Lectures daily except Saturday. Laboratory work two hours per day. Assistant Professor KAHLENBERG. Four-fifths credit for lectures and laboratory work together.
5. Research Work in Physical Chemistry. This course may be taken by advanced students. Credit will be given on the basis of two-fifths for one semester for laboratory work amounting to two hours per day. Seniors and graduates desiring to prepare a thesis may avail themselves of this course. Assistant Professor KAHLENBERG.
6. Organic Chemistry. This course includes the study of the more important hydrocarbons and their simpler derivatives. The more important compounds of the aromatic series as well as those of the fatty series will be considered. *Lectures daily, laboratory work two hours per day.* Assistant Professor KAHLENBERG. Four-fifths credit for lectures and laboratory work.

7. **Advanced Organic Chemistry.** Advanced students may take up ultimate and proximate organic analysis or a course in the preparation of fatty or aromatic compounds. Credit will be given on the basis of two-fifths for laboratory work amounting to two hours per day. Assistant Professor KAHLENBERG.

GEOLOGY.

PROFESSOR VAN HISE AND PROFESSOR KÜMMEL.

1. **Physical Geography.** The subject will be treated from the dynamic point of view, the purpose being to develop the principles of the subject in such a way that a teacher may apply them to local features. *Lectures five times per week with excursions two or three times per week.* The course will be accepted as adaptive work in science for admission to the University. Professor KÜMMEL.
2. **General Geology.** The geological forces, both epigene and hypogene. The geological history of North America. The course will presuppose a fair knowledge of physical geography, the latter subject being taught in the Summer School. *Lectures five times per week with excursions two or three times per week.* Three-fifths credit. Professor KÜMMEL.
3. **Principles of Metamorphism and the Metamorphic Rocks.** Equivalent to one-half of a full study for one semester. Professor VAN HISE.
4. **Advanced and Research Work in Geology.** Advanced work in geology will be given, adapted to the individual applicants. Physical geology or metamorphic geology may be taken up, or a piece of special research work. This may be the development of some study which the student has already begun, or if desired a particular piece of work will be assigned in connection with petrology or metamorphism. Professor VAN HISE.

The student may give part or all of his time to the special investigation. Credit in proportion to work done.

ZOOLOGY.

PROFESSOR BIRGE.

1. **General Course.** The student should be already familiar with the elements of classification or should prepare them from a text book during the term. The lectures will deal

with general topics not sufficiently developed in most text books. Lectures daily. Professor BIRGE.

- 1a. Laboratory work. A course of at least two hours of laboratory work daily, accompanying the lectures. Professor BIRGE and Assistant. Three-fifths credit.
2. Investigations of Lake Biology. An elementary course on lake life, including the determination of the main genera of microscopic plants and animals found in the littoral and limnetic regions. The use of the thermophone and the Negretti-Zambra thermometer, the plankton net, the automatic net, and the plankton pump; the qualitative and quantitative determination of plankton, e c. For seniors who desire thesis work and for graduates. Only a limited number of students can be admitted, and applications should be made as early as possible. The course will occupy several hours daily. Professor BIRGE. Three-fifths credit.

HISTOLOGY AND ANATOMY.

ASSISTANT PROFESSOR MILLER.

1. Vertebrate Histology. Instruction in this course will consist of daily lectures supplemented by work in the laboratory. Three-fifths credit.
2. Mammalian Anatomy. This course is a laboratory course in dissection. It is of special value to teachers of physiology who have not had opportunity for such work and to students who wish to enter the regular classes in histology and embryology the following semester. Students must have passed their first year's biology.

BOTANY.

ASSISTANT PROFESSOR CHENEY AND ASSISTANT.

1. General Morphology of Plants. Lectures and recitations upon assigned readings and lectures; and laboratory work. *Five times a week. M. to F.*
2. General Vegetable Anatomy. A systematic study of the tissues of phanerogams and ferns. Some attention will be given to the use of reagents and stains, modes of embedding, section cutting, and preparing permanent mounts. Laboratory work with assigned readings and recitations. *Five times a week. Two-fifths credit.*

3. A course intended to give general instruction concerning the collecting, drying, mounting, and naming of flowering plants, ferns, and mosses. Work in the field will form a special feature of this course. *Three times a week.*
4. Characteristics of Trees. If a sufficient number of students desire it, a course intended to acquaint them with the native forest trees, will be given. Not more than twice a week.

Summer School Course without University Credit.

5. General Botany. The course comprehends such a study of the lower forms of plants as a fairly well equipped high school laboratory will permit; a study of the morphology of the organs of flowering plants; and some simple physiological experiments, such as may be conducted by any teacher of botany. *Lectures and laboratory work daily except Saturday.*

BACTERIOLOGY.

MR. FROST.

1. Germ Life. This course is primarily intended for teachers in the secondary schools. The lectures will be illustrated by lantern slides, charts, and cultures, and microscopical preparations of bacteria. *Three times per week. One-fifth credit.*
2. Elementary Bacteriology. This course is intended to meet the wants of students who desire to take advanced work in bacteriology, either along medical, sanitary, or agricultural lines. *Lectures five hours per week and laboratory work ten hours per week. Three-fifths credit.*

DRAWING.

MISS TANNER.

1. Elementary Course. This course includes free hand perspective and light and shade of objects and buildings, plants, and natural forms. Blackboard drawing will be required. Mediums used, crayon and pencil.
2. Advanced Course. The work will embrace drawing from nature and the human figure, and pictorial composition. There will be some work in design and discussions upon

methods of teaching. Mediums used: pencil, ink, crayon, charcoal, and water-color. This course is arranged for advanced students and supervisors of drawing.

3. Scientific Drawing. The work will include studies from botany, zoology, and general histology. Mediums used: crayon for blackboard drawing, pencil, and water-color. This course is arranged for those who are studying and teaching science.

All courses are given daily at hours to be arranged.

PHYSICAL CULTURE.

DR. ELSOM, MR. DAVIES, AND MR. ISHIKAWA.

These courses are intended primarily for those who propose fitting themselves as teachers of physical training in schools, normal schools, and colleges. The courses are also open to all students who are seeking their own personal improvement by means of a systematic course of bodily training.

The exercises will be conducted in the Armory and Gymnasium, and all the privileges of the building, as well as a physical and medical examination, will be given those who pay the fees.

The courses will be divided into theoretical and practical. In the theoretical course, conducted by Dr. Elsom, the following subjects will receive attention:

Personal hygiene, lectures on bathing, sleep, exercise, diet. Physical Training, practice of methods employed in different institutions. First aid to the injured, anthropometry, etc.

In the practical course under Dr. Elsom, Mr. Davies, and Mr. Ishikawa will be given exercises in light gymnastics, heavy gymnastics, track and field athletics, rowing and swimming.

Fees.—A fee of \$2.50 for the use of the Gymnasium will be charged all who use the building. Fees for the practical and theoretical courses in physical culture, \$5.00 each.

For full information, address Dr. J. C. Elsom, Director.

PHYSICAL TRAINING FOR WOMEN.

MISS HARRIS.

A course in physical training for women will be given in the woman's gymnasium at Ladies' Hall. The class will meet daily, dividing the time between a lecture and practical exercises. The lectures will dwell on such topics as the value of

physical training, its relation to education, personal hygiene, correct dress, games and outdoor sports, gymnastics in public schools, school hygiene, etc. The exercises will include Swedish and Americanized Delsarte movements and other gymnastics suited to the school-room and home. Those expecting to take this course should provide themselves with suitable costume.

For special circulars of the Summer Session, address W. D. Hiestand, Registrar, Madison, Wis.

WISCONSIN SUMMER SCHOOL OF LIBRARY SCIENCE.

The Wisconsin Free Library Commission announces that the fifth annual session of the Summer School of Library Science will be held at Madison, Wis., as a department of the Summer Session of the University of Wisconsin, from July 3 until August 25, 1899.

The course is intended for librarians of the smaller public and school libraries, assistants in the larger libraries, and teachers. Aside from the usefulness of the lectures and practical work covering all library processes and departments, the Summer School is especially valuable in affording opportunity for comparison of methods and exchange of ideas and experiences. Each student is urged to give members of the school the results of her experience and to ask for help in solving library problems, not only from the instructors, but also from fellow students.

The course will be under the direction of Miss Cornelia Marvin, of Scoville Institute, Oak Park, Ill., who has conducted the school for the past two years.

COURSE OF INSTRUCTION.

The instruction, as outlined in the program, will follow the treatment of a book in logical order through all the processes in the library, selecting, ordering, accession, classification, shelf-list, catalog, loan, repair, and rebinding.

The first half of the course will be devoted to general library topics, records, processes, and reference work. The entire time for the last four weeks will be given to cataloging, classification, and care of documents.

No text books are used, the instruction being entirely by lecture, demonstration, and laboratory work.

The work is planned to occupy the student six hours a day, two hours for the class and four for the practical work assigned to illustrate the lecture.

Each student will take away from the school corrected samples of all library records and a dictionary card catalog of from 150 to 200 books, selected to illustrate, as far as possible, the catalog rules necessary for the average library.

ADMISSION REQUIREMENTS.

The number of students is limited to twenty. Only those will be received who have had some library experience, excellent educational opportunities, or are preparing to take positions which have been offered them in libraries.

While all librarians who think of attending the summer school are urged to plan for the full eight weeks' course, special students will be received for cataloging and classification in the last half.

Students will not be received for the first four weeks alone, and no deduction will be made from the tuition of those who do not complete the course.

Special privileges for further study will be given to those students whose work is of a very high grade. Apprenticeships with instruction are offered in some of the best small libraries of the west. This plan for practical work in libraries administered under the best methods, is considered a strong feature of the school.

Talks will be given by prominent library and educational workers, so that the students may have an opportunity to meet the leaders of their profession in the west.

LIBRARIES.

The University Library, containing about 54,000 books and 10,000 pamphlets, will be open for the use of the students of the Summer School. They can also have access to the library of the State Historical Society, which contains 110,000 volumes and 80,000 pamphlets, one of the most complete and valuable collections to be found in the Northwest. The Madison City Library, of 15,000 volumes, will also be accessible for all the purposes of the school.

The Library Bureau, of Chicago, will make an exhibit of modern library appliances; Scoville Institute, Oak Park, Ill., will send a collection of posters, holiday exhibits and reading lists. The material collected at the office of the Wisconsin Free Library Commission, and the special collection owned by the Director, will be used for the study of forms and methods.

EXPENSES.

The tuition for the full course is \$15.00, for the special course in cataloging and classification, \$10.00.

Students who own copies of the Dewey Decimal classification, Cutter Author Table, Catalog of A. L. A. library, World's Fair papers, Plummer's Hints to Small Libraries, and the Denver Public Library Handbook, should bring them to the school.

Other supplies will be on sale. The cost of these need not exceed three dollars.

Board can be obtained in Madison at the rate of \$2.50 to \$4.00 per week for table board, or \$5.00 to \$6.00 per week, including room rent.

Furnished rooms can be obtained at from 75c to \$1.00 per week, and board in clubs at \$2.25 to \$2.50 per week. Information regarding rooms and board will be given at the office of the School, Room 38, Science Hall, or by correspondence, if desired. Usually it is more satisfactory to make these arrangements after arrival at Madison, when all the conditions can be seen by the student.

PROGRAMME.

The following outline will show the scope of the course in the different departments of library work:

ACCESSION.—Selecting and buying books. Care of serials, duplicates, and gifts; plating, pocketing, embossing, accessioning.

SHELF.—Arrangement; book numbers; shelf and book labels; care of public documents, pamphlets and clippings; shelf list and inventory.

CATALOG.—Catalog supplies; dictionary cataloging (four weeks); preparation of printed finding list.

CLASSIFICATION.—The Dewey classification is studied during the last four weeks of the course. The student has practical work in classifying a number of books which best illustrate the use of the system.

LOAN.—General talks are given on principles and supplies, and special systems of public and school libraries are discussed.

BINDING.—Materials; preparation of books for the bindery; repairing. The students learn the processes of binding by visits to the binderies of Madison.

REFERENCE.—Talks are given on the use of reference books—indexes, special encyclopaedias, handbooks, etc.—and methods of reference work are discussed.

GENERAL LIBRARY TOPICS.—Shelving; furniture and fittings; library publications; library schools; library associations and commissions; traveling and home libraries; the children's room; children's reading; the library and the schools; librarian's report; library service.

For further information, address Dr. E. A. Birge, Madison, Wis., Miss Cornelia Marvin, Scoville Institute, Oak Park, Ill., or F. A. Hutchins, Secretary Wisconsin Free Library Commission, Madison, Wis.

WASHBURN OBSERVATORY.

STAFF.

- C. K. ADAMS, LL. D., President of the University.
G. C. COMSTOCK, Ph. B., LL. B., Director and Professor of Astronomy.
A. S. FLINT, M. A., Assistant Astronomer.
W. A. HOYT, Student Clerk.
F. H. REHBERG, Student Assistant, Meteorology.
JOHN DOESCHER, Janitor.

The Washburn Observatory was established in the year 1878 through the munificence of the late Gov. C. C. Washburn. Although its obligations and opportunities as a branch of a teaching university have not been ignored, the energies of its staff from the beginning have been directed mainly to astronomical research. Among the lines of research which have been cultivated may be specified the measurement of the positions and motions of the heavenly bodies, the discovery and measurement of double stars, the investigation of variable stars, the study of changes of latitude and of the amount and character of the atmospheric refraction, the determination of the amount of the aberration of light, and a systematic investigation of the parallaxes of all accessible stars which have large proper motions. The Observatory also maintains a tri-daily meteorological service.

The principal instruments of the Observatory are:

An equatorially mounted telescope of 15½ inches aperture, constructed by Alvan Clark and Sons, and provided with graduated circles, driving clock, a filar micrometer, double image micrometer by Steinheil, a spectroscope, astro-photometer, and a very complete set of eye-pieces; a meridian circle, by A. Repsold & Sons, of Hamburg, with collimators, transit micrometer, and the usual accessories of such an instrument. This instrument is figured in the last edition of the Encyclopaedia Britannica as the type of its class. The objective of the instrument was made

by the Clarks, and has an aperture of 4.8 inches and a focal length of 58 inches. The circle is graduated to 2 minutes of arc. For the past four years this instrument has been employed for an extensive series of determination of stellar parallax. A floating mirror has been added to it as an auxiliary for the determination of its horizontal points and flexures. There are also a sidereal clock by Höhwü, of Amsterdam, two mean-time clocks by Howard, of Boston, all excellent time-pieces, and a chronograph, by Fauth & Co., of Washington.

In the Student's Observatory are mounted a six-inch equatorial telescope, by Alvan Clark & Sons, a transit instrument of the broken telescope type, by Bamberg. These instruments, while primarily intended for instruction, are well adapted to and are employed for certain classes of original work. In particular, the equatorial telescope has been provided with reflecting prisms (Loewy), and employed as one of the principal instruments of the Observatory in an investigation of the refraction and the constant of aberration, and the Bamberg instrument is used for latitude determinations by the Talcott method and for the time service of the Observatory. The Observatory also possesses a considerable number of subsidiary instruments, such as portable telescopes, spectroscopes, photometers, chronometers, sextants, an engineer's transit, an altazimuth, a universal instrument of the German type, a spherometer caliper, seismoscopes, and a complete set of meteorological instruments.

The Woodman Astronomical Library, established in connection with the Observatory, and supported from the income of a fund given by the late Cyrus Woodman, Esq., possesses a large and valuable collection of works upon astronomy and kindred subjects.

By provisions of law the results of important investigations conducted at the Washburn Observatory are published by the State, and under this provision ten volumes, representing the more important work done at the Observatory, have been issued.

Students of sufficient technical attainments are admitted to the Observatory and take part in the investigations in progress. Meritorious original work of such students may be included in the Publications of the Observatory, or in the Bulletins of the University. The courses of instruction in astronomy are stated upon pages 117 and 118.

COLLEGE OF MECHANICS AND ENGINEERING.

STAFF OF INSTRUCTION.

- C. K. ADAMS, LL. D., President of the University.
J. B. JOHNSON, C. E., Professor of Engineering, Dean of College of
Mechanics and Engineering.
STORM BULL, M. E., Professor of Steam Engineering.
J. E. DAVIES, A. M., M. D., LL. D., Professor of Electricity and
Magnetism, and Mathematical Physics.
D. C. JACKSON, C. E., Professor of Electrical Engineering.
F. R. JONES, M. E., Professor of Machine Design.
C. I. KING, Professor of Mechanical Practice.
J. G. D. MACK, M. E., Assistant Professor of Machine Design.
E. R. MAURER, B. C. E., Assistant Professor of Pure and Applied
Mechanics
A. W. RICHTER, M. E., Assistant Professor of Experimental Engi-
neering.
L. S. SMITH, C. E., Assistant Professor of Topographic and Geo-
detic Engineering.
B. V. SWENSON, B. S., Assistant Professor of Electrical Engineer-
ing.
F. E. TURNEAURE, C. E., Professor of Bridge and Sanitary Engi-
neering.
N. O. WHITNEY, C. E., Professor of Railway Engineering.
WALTER ALEXANDER, B. S., Instructor in Steam Engineering.
C. F. BURGESS, E. E., Instructor in Electrical Engineering.
R. W. HARGRAVE, B. S., Instructor in Engineering.
M. C. BEERE, B. S., Instructor in Electrical Engineering.
MICHAEL BONN, Foreman of Foundry.
WILLIAM LOTTES, Foreman of Blacksmith Shop.
IRVING MUTCHEER, Assistant in Wood Shop.
W. J. FENNELL, Student Assistant in Machine Shop.
L. W. AUSTIN, Ph. D., Assistant Professor of Physics.
C. A. CURTIS, A. B., Professor of Military Science and Tactics.
G. C. COMSTOCK, Ph. B., LL. B., Professor of Astronomy.

- W. W. DANIELLS, M. S., Professor of Chemistry.
 D. B. FRANKENBURGER, A. M., Professor of Rhetoric.
 H. W. HILLYER, Ph. D., Assistant Professor of Organic Chemistry.
 W. H. HOBBS, Ph. D., Assistant Professor of Mineralogy and Petrology.
 J. M. CLEMENTS, Ph. D., Assistant Professor of Geology.
 E. T. OWEN, A. B., Professor of French.
 W. H. ROSENSTENGEL, A. M., Professor of German.
 E. B. SKINNER, A. B., Assistant Professor of Mathematics.
 C. S. SLICHTER, M. S., Professor of Applied Mathematics.
 B. F. SNOW, Ph. D., Professor of Physics.
 C. R. VAN HISE, Ph. D., Professor of Geology.
 ARTHUR BEATTY, Ph. D., Instructor in Rhetoric.
 W. B. CAIRNS, Ph. D., Instructor in Rhetoric.
 W. D. FROST, M. S., Instructor in Bacteriology.
 LUCY M. GAY, B. L., Instructor in French.
 LOUIS KAHLENBERG, Ph. D., Instructor in Chemistry.
 F. W. MEISNEST, B. S., Instructor in German.
 THEODORE RUNNING, M. S., Instructor in Mathematics.

SPECIAL LECTURERS.

- R. S. WESTON, B. S., Consulting Sanitary Chemist.
 Some Aspects of Water Purification.
 JOHN F. HATFORD, C. E., Expert Computer and Geodesist U. S.
 Coast and Geodetic Survey.
 Some of the Methods and Results of the Transcontinental
 Chain of Triangulation Along the 31st Parallel of Latitude.
 WALTER B. SNOW, Mechanical Engineer for the B. F. Sturtevant
 Co., Boston. Mechanical Draft.

ORGANIZATION OF THE COLLEGE.

The College of Engineering is organized in the belief that a thorough-going fundamental training is the first essential to a successful engineer, but that this fundamental training may be best secured in connection with a certain amount of study of the practical applications of the principles involved and not solely by theoretical study. It is further a leading thought that after the fundamental principles have been mastered, a certain measure of specialization in the main lines of engineering is advis-

able, because of the great development of engineering in recent years, and the various phases which it is rapidly assuming. It is the endeavor of this institution to combine a prudent amount of specialization in the closing years with a thorough grounding in the fundamentals in the earlier portion of its courses; and in carrying out this plan, it endeavors to make the mathematical and theoretical courses strong in the earlier years, and the applied courses strong in the latter years, while the draughting and shop courses continue progressively from the beginning to the end. It also introduces sufficient foreign language to enable its graduates to read the professional German or French literature, and aims to give so much of the mastery of the English language as to enable its graduates to present professional subjects with ease, clearness, and effectiveness.

Especial encouragement is given to those who can afford the time to graduate in a collegiate course before entering the course in engineering. By electing the mathematics required of engineers during the collegiate course, the degree in engineering can be obtained in two additional years. Greater satisfaction and profit is gained from the study of engineering when the student has already acquired a broad and thorough general training. Engineers are often called upon to fill the highest positions in the community, demanding breadth of view and wide general training. The opportunities for acquiring this breadth of education, as it is given by a complete collegiate course, are few, after the student has begun the active practice of his profession.

The College of Mechanics and Engineering offers five systematic courses, as follows:

A Course in CIVIL ENGINEERING.

A Course in SANITARY ENGINEERING.

A Course in MECHANICAL ENGINEERING.

A Course in ELECTRICAL ENGINEERING.

A Course in APPLIED ELECTRO-CHEMISTRY.

To those students who desire a course in METALLURGICAL ENGINEERING, elections are offered for advanced work in geology, mineralogy, commercial assaying, and chemistry, and the general engineering courses in metallurgy, treatment of ores, electro-metallurgy, and mining surveying.

REQUIREMENTS FOR ADMISSION.

There are two methods of admission to the University.

- I. By examination at the University.
- II. By certificates from accredited schools.

I. Examinations at the University.

The regular examinations of the University are two in number; one in June and one in September. For the current year the earlier examination will be held on Thursday and Friday, June 15 and 16, beginning at 9 a. m. The latter examination will be held on Tuesday and Wednesday, September 26 and 27, beginning at 9 a. m. Examinations will also be held on the opening day of the second semester. Candidates must be present at the first examination of the first day. The examinations for admission to the freshman class in any of the engineering courses will cover the following subjects.

GEOGRAPHY, political and physical.

HISTORY OF THE UNITED STATES: Montgomery's or Johnson's History of the United States.

ARITHMETIC.

ALGEBRA: Addition, subtraction, multiplication, division, equations of the first degree with one unknown number, simultaneous equations of the first degree, factors, highest common factor, lowest common multiple, quadratic equations, simultaneous equations above the first degree, theory of indices (positive, negative, fractional, and zero), and radicals.

GEOMETRY: Plane and solid geometry. In solid geometry, special attention should be given to the geometry of the sphere.

ENGLISH: 1. An analysis of short extracts from prose and poetry, as to forms and meaning of words, structure of sentences, paragraphing, and figures of speech.

2. Each candidate will be required to write a short essay on a subject to be announced at the time of the examination. The essay will be taken as a test of a candidate's knowledge of spelling, punctuation, use of capital letters, grammar, structure of sentences, and paragraphs.

GERMAN: Correct pronunciation, the essentials of grammar (Collar-Eysenbach's, Joynes-Meissner's, Whitney's, etc.), and the ability to apply them (two terms' work in high school); acquisition of a vocabulary sufficient to enable students to read and translate sixty reading lessons in any standard reader correctly and understandingly; practice in the oral use of German in connection with the reading lessons, and the memorizing of from nine to twelve German poems (two terms' work), and the careful study of at least two plays, as *Minna von Barnhelm*, *Der Neffe als Onkel*, *Die Journalisten*, etc. (two terms' work).

FRENCH: Instead of German, an equivalent amount of French may be offered.

PHYSICS: Carhart and Chute, Gage, or Avery, with laboratory work.

PHYSIOLOGY: Martin's The Human Body (briefer course).

BOTANY: Two terms' study required, of which at least 60 hours shall be laboratory work devoted to the anatomy and physiology of plants. It is urged that part of this time be given to a study of cryptogams. For entrance in 1898-99 and thereafter a knowledge of the main groups of cryptogams will be required.

ADAPTIVE WORK; amounting to one daily recitation for two years.

This may consist of various subjects. The University advises:

1. Two years' daily work in French or Latin; or
2. One year's work in history and one year's work in English literature.

If these studies cannot be taken, a selection from the following studies may be offered:

3. Rhetoric, civil government, mental science; theory and art of teaching, zoology, astronomy, or other science. No subject can be offered which has been pursued in high school for a shorter time than twelve weeks or which is less in amount than a standard high school text-book on the subject. The total amount offered must be equivalent of a daily recitation for two years. The two years work may be made up of these studies in any combinations, under the conditions stated above.

Real equivalents will be accepted for the requirements given above. Students desiring admission into any course must present those requirements which are essential to the work of the course.

Conditions in entrance examinations will be limited to those cases in which the Board of Examiners think that the maturity and strength of the student will allow him to carry the regular work of his course and make up the conditions.

Admission of Special Students.

Candidates under twenty-one years of age desiring to take special courses will be required to present the same qualifications as candidates for one of the regular courses of the University.

Persons twenty-one years of age, who are not candidates for a degree, and who wish to take special studies, will be permitted to

do so upon giving satisfactory evidence that they are prepared to take the desired studies advantageously. If they subsequently desire to become candidates for a degree, or to take a regular course, they must pass the required entrance examination.

II. Admission Upon Certificates.

Graduates of schools which have been accredited to the University for the General Science and Engineering courses will be admitted to any one of the Engineering courses upon presentation of a certificate from the principal of the school.

Preparation in Algebra for the Engineering Courses.

Thorough preparation in mathematics is of the greatest importance to students entering the engineering courses of the University; and it is therefore advised that such students carefully review algebra either during the last term of their high school course or during the summer preceding their entrance into the University. The University faculty consider it advisable that the review be made wherever practicable, during the last term of the high school course.

DEGREES.

The University confers upon the graduates in the Engineering courses the degrees of Bachelor of Science in Civil, Sanitary, Mechanical, Electrical Engineering, or Applied Electro-Chemistry.

The degrees of Civil Engineer, Mechanical Engineer and Electrical Engineer are conferred as second degrees upon Bachelors of Science in the Civil, Mechanical, and Electrical Engineering courses respectively, (1) who pursue advanced professional study at the University for one year, and present a satisfactory project or thesis; or (2) who present suitable evidence of three years of professional work, of which one must be in a position of responsibility, and a satisfactory thesis.

University Fellowships.

For the purpose of promoting higher scholarship and more extended original study than the academic courses afford the Board of Regents has established ten University Fellowships of \$400 each, conditioned upon proper qualifications and upon a prescribed amount of instruction rendered in the University.

QUARTERS AND EQUIPMENT.

Much of the laboratory, draughting, experimental, and class work of the College of Mechanics and Engineering is provided for upon the two lower floors of Science Hall, one of the best educational structures in this country. Shop work and additional laboratory work is carried on in a well-equipped building exclusively devoted to the purpose, which, through the generosity of the legislature of 1893, has been largely extended; the chemistry, assaying, and metallurgical work are carried on in the Chemical Laboratory, a fine structure built especially for the purpose. The work in physics, mineralogy, geology, etc., is carried on in other parts of Science Hall; the practical astronomy at the Students Observatory; the language and mathematical studies in the literary halls of the University. The advantages of association with students seeking general and literary culture are thus secured. All laboratories and courses of study in the University are open to the students in engineering for elective work.

The last legislature appropriated one hundred thousand dollars for the erection and equipment of a modern engineering building, for the separate use of the College of Mechanics and Engineering.

LIBRARIES.

The library facilities of the University are very great. Besides the University library, containing more than 54,000 volumes, of which a good share of books pertaining to the engineering profession, there are the library of the State Historical Society (150,000 volumes) and the City free library (15,000 volumes) to which the students have free access. The College of Mechanics and Engineering subscribes for eighty-five technical periodicals, and these are kept in the engineering reading-room in Science Hall in order to facilitate the frequent use of them by the engineering students. The files of technical periodicals in the library are unusually complete, and additions are made every year.

Laboratories and Apparatus.

The engineering laboratories are well equipped for purposes of instruction and investigation.

The Testing Laboratory has recently been moved to its new quarters, a large room having been provided for the purpose in the new extension of the machine shop. The University has also

recently purchased a one-hundred-thousand-pound Riehle automatic and autographic testing machine, permitting the testing of materials of the larger sizes used in practice. In addition to this there are also other Riehle machines, also Olsen and Thurston machines for making tests in tension, compression, bending, and torsion. These machines are supplied with extensometers, clamps, devices for autographic records, and other special devices.

The Cement Laboratory contains a full supply of necessary apparatus for making tests according to the American Society of Civil Engineers' standard; baths, self-recording thermometer, Boehme hammer complete, 1,000-lb. Riehle testing machine, a new electro-power stone saw, and grinding and polishing wheels. The machines in the Testing Laboratory are also used for testing brick, stone, and cement. The foundry rattler is available for paving brick tests.

The Hydraulic Laboratory contains high and low level tanks fitted for experimenting upon the flow of water through orifices, nozzles, pipes, and over weirs. In the laboratory are several water motors, water meters, current meters, lines of pipe, etc., all available for experimental work. There is also a convenient supply of gauges and other apparatus required in accurate hydraulic experiments.

The Steam Engineering Laboratory contains a hot air engine, a gas engine, a ten horse-power gasoline engine, and several steam engines of various types. The most important experimental engine is a fifty horse-power quarter-crank compound engine, so arranged that either cylinder can be supplied with live steam from the boilers and run as a single cylinder engine. The condenser and pumps can also be disconnected so that the engine may be run as a non-condensing one. Both cylinders and the receiver are provided with steam jackets, which may be used at will. By means of a Proell governor, the number of revolutions may be varied from 50 to 125. The cylinders each have four poppet valves, and the cut-off of the steam is automatically controlled by the governor and may vary between zero and nine-tenths of the stroke. A fifty horse-power Root boiler furnishes the steam for this engine exclusively. The laboratory is supplied with friction brakes, transmitting dynamometers, mercury, column, and other means for testing steam, water, vacuum, and other gauges, and various devices for special tests; there are also the necessary tanks, weighing apparatus, pyrometers, calorimeters, indicators, etc., for making complete tests of the economy

and capacity of boilers and engines; with a variety of minor and accessory apparatus. The laboratory contains a large model of Stephenson's link motion, in connection with the piston, cross-head, connecting-rod, and crank of the engine. A 5-ton ammonia refrigerating plant has just been added to the equipment of the laboratory. It has been arranged in such a manner that a great many useful and interesting experiments and tests may be performed with it. All the necessary smaller apparatus for such tests are on hand. It is believed that a large field for original investigations has been opened up by the acquisition of this plant.

The Electrical Laboratories are well supplied with exact scientific and commercial instruments, and are arranged for instruction and investigation. With the space and apparatus which is allowed through the generosity of past legislatures, the equipment has been made unusually complete in the lines of continuous current, and single and polyphase alternating current generation and distribution, and commercial electro-chemistry, and electro-metallurgy.

The dynamo collection consists of a large number of continuous-current and alternating-current generators and motors of various types (including four types of arc-light machines), which are specially installed for the purposes of instruction and experiment. These are arranged in a large laboratory room, with a special engine of exceedingly close speed regulation. For use in testing dynamos all necessary apparatus is supplied, including large lamp banks, transformer banks, and water rheostats for loading generators, special prony brakes, etc., for loading motors, cradle dynamometer, and accurate electrical instruments of all useful types. A transformer bank for use in instruction and testing, which represents nearly all American and some foreign products, and an equally complete bank of recording electric meters, are also located in this room.

Another large room is occupied by the appliances and apparatus required for instruction and experiments relating to electric batteries, electrolysis, electroplating, and electrometallurgy. The equipment for this laboratory consists of dynamos and tanks for depositing metals and for other electrolytic processes; apparatus for cleaning, polishing, and burnishing; various electric furnaces for electrometallurgical processes requiring the intense heat of the electric arc; and proper measuring instruments. The equipment is one of the first and most complete of its kind.

A great number of amperemeters, voltmeters, wattmeters, wheatstone bridges, variable self-inductance and mutual-inductance boxes, condensers, galvanometers, electrodynometers, electric balances, 100,000 ohm and megohm resistances, Clark cells, Burgess electrometer testing sets, and other apparatus are supplied for general use, while standard apparatus for determining the adjustments of the general instruments is at hand. Special means are provided for the important functions of insulation testing, testing the magnetic qualities of metals (including a Ewing hysteresis tester, a Ewing magnetic bridge, and an improved bridge designed at the University), for photometry of arc and incandescent lamps, and for measuring the distribution of illumination (in which the equipment is very full), etc. Apparatus is also provided for class-room demonstration, such as Thorndarson's apparatus for demonstrating the phenomena of polyphase current transformation and polyphase motors, a fine set of models and charts (made at the University) illustrating the different forms of armature windings, etc.

A Thomson electric welder, located in the dynamo room, gives opportunity for instruction upon the electrical working of metals, and a transformer of twenty kilowatts capacity furnishes alternating current at 50,000 volts pressure for instruction in high pressure testing and the phenomena of high pressure electric power transmission. Alternating and polyphase (2-phase and 3-phase) currents of the ordinary frequencies are on tap at the switchboards, and other frequencies may be generated at will by means of rotary transformers one of which has a capacity of 30 kilowatts. Continuous currents of any desired value up to 400 amperes and pressures up to 1000 volts can be had at will.

All electrical laboratory instruction is made to conform with, and illustrate, the class room instruction. Of the total number of hours given to instruction in the electrical engineering courses, about one-half is devoted to work in the laboratories.

The Bridge Engineering Department has recently purchased a set of Fraenkel's autographic apparatus for the testing of bridges under moving train loads. This includes two extensometers for measuring strains in members and a deflectometer for measuring vertical and lateral deflections. The department also possesses several large size models of bridge joints and a large collection of drawings and photographs to which additions are constantly being made.

The Assay Laboratory, situated in the south part of the base-

ment of the Chemical Laboratory, is one of the largest and best equipped laboratories of its kind in the country. It has separate rooms for furnaces, tables, wet assaying, and balances. The furnace room is supplied with eleven crucible and three muffle furnaces, as well as a small gas plant. It has steam power, a Sturtevant blower, bullion rolls, a Blake ore crusher, and other pulverizers. The table room has space for twenty-four students, and is well supplied with ordinary balances. In the balance room are first-class quantitative balances by Becker, and an Oertling gold balance.

The Surveying Laboratory. By an agreement with the director of Washburn Observatory, the surveying laboratory shares in the free use of the extensive apparatus belonging to that observatory, and including, in addition to the large equatorial telescope and meridian circle, collimators, transit micrometers, chronograph, sidereal and meantime clocks, zenith telescopes, a transit instrument of the broken type, chronometers an altazimuth, a universal instrument of the German type, spherometer calipers, and complete set of meteorological instruments.

In addition to this equipment the surveying laboratory contains all the portable, astronomical, and field instruments needed for an extensive triangulation and topographic and hydrographic surveys, including one 3-inch direction theodolite by Fauth, reading to single seconds, three theodolites by Buff and Berger, Fauth, and Bambey, reading to ten seconds, an altazimuth by Hyde, reading to six seconds, a tidal gauge, six heliotropes, a complete precise level outfit by Kern, a sounding apparatus, a base line apparatus| two current meters by Ritchie, Haskell, and Buff and Berger, twelve engineer's transits of various designs, one complete mining transit with auxiliary side and top telescope and lamp targets by Buff and Berger, four soda transits and compasses, an ample number of wye, dumpy, and architects' levels, plane tables, telemeter, level rods, surveyors' compasses, and such special instruments as planimeters, pantographs, trigonometers, sextants, computing machines, aneroid barometers, odometers, pedometers, clinometers, binocular telescopes, telescopic hand levels, etc., etc.

The Machine Shop affords excellent facilities for mechanical practice. It embraces a main machine room properly equipped; a carpenter shop supplied with wood-working machines; a forge room, provided with forges and their equipment, with blast and exhaust fan; a foundry room whose equipment consists of a

cupola, brass furnace, and core oven, with the necessary small tools; a wood-work room supplied with benches, carpenter tools, and wood-turning lathes; and a pattern room furnished with the requisite tools. The shop is supplied with convenient lockers, closets, and washroom with hot and cold water. The space and equipment of the shop has lately been increased nearly three-fold to provide for the rapid increase in the number of students entering the classes of the College of Engineering. New lathes, forges, drills, and benches have been added with the increase of space until 150 students may be instructed in the different branches of the work at one time.

The *Engineering Museum* contains a complete set of Schroeder's models for descriptive geometry, including shades, shadows, and perspective; also a small collection of Schroeder's kinematic models, besides a number of smaller models, made by students, illustrating problems in kinematics. An excellent industrial collection is in process of development.

The draughting rooms contain a large and varied collection of general working and detail drawings illustrating a great variety of engineering structures and machines.

The standards of weights and measures belonging to the State are kept in the Civil Engineering Department, and all official comparisons are made here.

INSPECTION TOURS.

An inspection tour by the members of the junior class is provided for just previous to the Easter recess. In this tour visits are made to the great manufacturing establishments and to other important private and public engineering work of Chicago, Milwaukee, and elsewhere. Similar tours by sections of the senior class are provided for in the fall or just before commencement. These tours are made under the guidance of the professors and are deemed an important part of the student's work.

EXPENSES.

Tuition for residents of the State of Wisconsin, . . .	FREE.
Tuition for non-resident students—per semester, . . .	\$9.00
General fee—first semester,	6.00
General fee—second semester,	6.00
Engineering and periodical fee for the year,	1.50

A laboratory fee of \$1.50 per semester, for each two hours' work per week, is charged in all engineering laboratories.

Students working in any of the other laboratories of the University are also required to pay a fee or to make a deposit to cover the cost of the materials and repairs of instruments used by them. For a list of these fees, see p. 37.

Rooms, furnished and unfurnished, can be obtained in the city at reasonable rates. The cost of board in clubs is from \$2.25 to \$3.00 per week; in private families from \$2.50 to \$3.50 per week.

COURSES OF STUDY.

The attention of students who propose to pursue an engineering course is specially called to the opportunity which is presented for them to complete a general University course, and by taking advantage of the elections advised below to complete the technical course in two additional years. All students who can afford the time are strongly advised to pursue this plan.

CIVIL ENGINEERING COURSE.

Freshman Year, First Semester.

	Hrs.
French 3, or German 5,	5
Rhetoric and Composition 2,	3
Mathematics 1, Algebra,	5
Mathematics 7, Descriptive Geometry,	5
Topographical Engineering 1, Drawing,	3

Second Semester.

French 3, or German 5,	5
Rhetoric and Composition 2,	3
Mathematics 2 and 3, Trigonometry and Analytical Geometry,	5
Shop-work 1, 3, 7; 1, Wood Work; 3 Iron Work; 7, Forge Work,	5
Topographical Engineering 2a, Elementary Surveying,	3

Sophomore Year, First Semester.

Mathematics 3 and 4, Analytical Geometry and Calculus,	5
Physics 1 and 2,	5
Chemistry 1,	5
Mineralogy 2,	2
Topographical Engineering 2b, Plane Surveying,	3½

Second Semester.

	Hrs.
Mathematics 4, Calculus,	3½
Physics 1 and 2,	4
Chemistry 2,	2
Mechanics 1 and 2, Analytical Mechanics and Graphic Statics,	3
Topographical Engineering 4, Advanced Surveying,	2½

Junior Year, First Semester.

Mechanics 3, 4b, Strength of Materials and Hydraulics,	8
Steam Engineering 7, 9, Steam Engine,	3
Structural Engineering 1, Structural Details,	2
Railway Engineering 1, 2, Location,	5
Materials of Construction,	3

Second Semester.

Mechanics 5, Testing Materials,	1½
Railway Engineering 3, Maintenance of Way,	2
Topographical Engineering 5, Geodesy,	2
Structural Engineering 2, 3, 4a, Masonry, Arches and Dams,	5½
Structural Engineering 5a, 7a; 5a, Bridges; 7a, Trusses and Girders,	6
Astronomy or Electrical Engineering,	4

Senior Year, First Semester.

Structural Engineering 4b, Dams and Sterotomy,	3
Structural Engineering 5b, 7b, Bridges and Trusses,	6
Railway Engineering 5, Railway Economics,	2
Geology 1, General Geology,	3
Municipal Engineering 1, Water Supply,	3
Elective,	4

Second Semester.

Railway Engineering 7, Tunnels and Substructures,	2
Rivers and Canals 1,	1½
Municipal Engineering 2, Sanitary Engineering,	3
Municipal Engineering 4, Roads and Pavements,	1½
Geology 5,	2
Contracts and Specifications,	1
Thesis and Elective,	10

Graduate Courses.

For graduate students and students desiring to specialize, opportunity is afforded in the elective courses and in courses arranged on consultation with the instructors, for advanced study in railway, structural, municipal, topographic or geodetic engineering, and for special laboratory investigations.

SANITARY ENGINEERING COURSE.**Freshman Year.**

Same as Civil Engineering Course.

Sophomore Year.

Same as Civil Engineering Course.

Junior Year, First Semester.

	HRS.
Mechanics 3, 4b. Strength of Materials and Hydraulics, .	8
Railway Engineering 1, 2, Location,	5
Materials of Construction,	3
Biology, of Water Supplies,	5

Second Semester.

Mechanics 5, Testing Materials,	1½
Railway Engineering 3, Maintenance of Way,	2
Topographic Engineering 5, Geodesy,	2
Structural Engineering 2, 3, 4a, Masonry, Arches, and Dams, .	5½
Structural Engineering 5a, 7a, Bridge Stresses, Roof and Bridge Design,	5
Chemistry 2, Water Analysis,	5

Senior Year, First Semester.

Steam Engineering 7, 9, Steam Engine,	3
Structural Engineering 4b, Dams and Stereotomy,	3
Structural Engineering 6, 7b, Bridge Design,	4
Municipal Engineering 1, 3, Water Supply,	5
Geology 1,	3
Steam Engineering 12, Heating and Ventilation,	2

Second Semester.

	Hrs.
Railway Engineering 7, Tunnels and Substructures,	2
Municipal Engineering 2, 3, Sewerage and Drainage,	5
Municipal Engineering 4, Roads and Pavements,	1½
Geology 5,	2
Electrical Installations 11,	4
Contracts,	1
Thesis and Elective,	5½

MECHANICAL ENGINEERING COURSE.**Freshman Year, First Semester.**

French 3, or German 5,	5
Rhetoric and Composition 2,	3
Mathematics 1, Algebra,	5
Mathematics 7, Descriptive Geometry,	5
Shop-Work 1, 2, Wood Work and Foundry,	3

Second Semester.

French 3, or German 5,	5
Rhetoric and Composition 2,	3
Mathematics 2, 3, Trigonometry and Analytical Geometry,	5
Mathematics 7, Descriptive Geometry,	3
Shop-Work 2, 3, 4, 5, 6, Foundry and Machine Shop,	5

Sophomore Year, First Semester.

Mathematics 3, 4, Analytical Geometry and Calculus,	5
Physics 1, 2,	5
Chemistry 1,	5
Machine Design 1, Elementary Drawing,	3
Shop-Work 7, 8, Forge Work and Machine Shop,	3

Second Semester.

Mathematics 4, 6, Calculus and Differential Equations,	5
Physics 1, 2,	4
Chemistry 2,	3
Mechanics 1, Analytic Mechanics,	5
Machine Design 2, Drafting and Blueprinting,	3

Junior Year, First Semester.

	Hrs.
Mechanics 3, Strength of Materials,	5
Steam Engineering 1, 2, 8, Thermodynamics, Heat Engines,	5
Machine Design 3, Kinematics of Mechanics,	6
Shop-Work,	5

Second Semester.

Materials of Construction,	3
Hydraulics 4a,	2
Steam Engineering 2, 4, 8, Steam Engine; Laboratory,	8
Machine Design, 4, Crane Design and Graphic Statics,	8

Senior Year, First Semester.

Machine Design 5, Machine Elements and Power Transmission,	5
Steam Engineering 4, 8, Steam Engine Design; Laboratory,	6
Testing Materials,	2
Shop-Work 12, Machine Construction,	3
Dynamos 2, 3,	5

Second Semester.

Machine Design 5, Machine Elements and Power Transmission,	5
Steam Engineering 4, Steam Engine Design,	5
Hydraulic Engineering 1, 2, Motors and Pumps,	3
Contracts and Specifications,	1
Thesis and Elective,	7

ELECTRICAL ENGINEERING COURSE.**Freshman Year.**

Same as Mechanical Engineering Course.

Sophomore Year.

Same as Mechanical Engineering Course.

Junior Year, First Semester.

	Hrs.
Mechanics 3, Strength of Materials,	5
Physics 5, Precision of Measurements,	3
Applied Electro-Magnetism 1, 2, Electro Magnets and Dynamoes,	5
Machine Design 3, Kinematics of Mechanisms,	3
Shop-Work 9, 10, Tool Making and Machine Construction,	2½

Second Semester.

Hydraulics 4a,	2
Steam Engineering 5, 8, Thermodynamics and Laboratory,	5
Applied Electro Magnetism 1, 2, Electro Magnets and Dynamoes,	5
Electrical Installations 2, Electrical Testing,	3
Materials of Construction,	3
Elective in Civil and Mechanical Engineering,	3

Senior Year, First Semester.

Testing Materials 5,	1½
Alternating Currents 1, 2,	5
Steam Engineering 8, Laboratory,	2
From Electrical Installations 3, 7, 8, and Applied Electro- Chemistry 1, 2,	7
*Thesis and Elective,	6

Second Semester.

Contracts and Specifications,	1
Alternating Currents 1, 2,	2
Hydraulic Engineering 1, 2, Motors and Pumps,	3
From Electrical Installations 3, 4, 6, 8, 10, and Alternating Currents 3, 4,	9
*Thesis and Elective,	6

*Note:—The thesis should consume at least five hours for one semester. The work should begin in first semester and should usually continue through the year.

APPLIED ELECTRO-CHEMISTRY COURSE.**Freshman and Sophomore Years.**

Same as the Electrical Engineering Course.

Junior Year, First Semester.

	Hrs.
Mechanics 3, Strength of Materials,	5
Physics 5, Precision of Measurements,	3
Applied Electro Magnetism 1, 2, Electro Magnets and Dynamoes,	5
Chemistry 2, Inorganic,	3
Chemistry 9, Electro Chemistry,	5

Second Semester.

Hydraulics 4a,	2
Applied Electro-Magnetism 1, 2, Electro-Magnets and Dynamoes,	5
Materials of Construction,	3
Chemistry 2, Inorganic,	3
Chemistry 9, Electro Chemistry,	5
Elective,	3

Senior Year, First Semester.

Testing Materials 5,	1½
Applied Electro-Chemistry 2, Electrolysis,	5
Alternating Currents 1, 2,	5
Chemistry 10, Physical Chemistry,	4
Steam Engineering 7, 9,	3
*Thesis and Elective Mineralogy, Structures etc.,	3

Second Semester.

Contracts and Specifications,	1
Alternating Currents 1, 2,	2
Electrical Installations 4, Electric Lighting and Power,	3
Applied Electro-Chemistry 3,	5
From Electrical Installations 6, 8, 10, and	
Alternating Currents 3, 4,	6
*Thesis and Elective,	4

*Note:—The thesis should consume at least five hours for one semester. The work should begin in first semester and should usually continue through the year.

Graduate Courses.

Graduates and advanced students are offered instruction in advanced design and experimental investigations relating to electrical engineering as is more fully explained in later pages under Departments of Instruction, and also in earlier pages under Department of Graduate Study.

ELECTIONS FOR STUDENTS IN GENERAL UNIVERSITY COURSES.

Students who plan to graduate in engineering, after taking a degree in any other college of the University, should aim to make the following elections during their undergraduate course, in order that the engineering course may be completed in two additional years:

Freshman Year.

Mathematics, all courses; Topographical Engineering, 1 and 2a, or Machine Design, 1.

Sophomore Year.

Mathematics, all courses; Physics, 1 and 2; Topographical Engineering, 2 and 4, or Machine Design, 1, 2, and 3; Pure and Applied Mechanics, 1.

Graduates in any of the Engineering courses may graduate in any other Engineering course after one year of additional study. Students who contemplate doing this should, however, make their elections, especially in the senior year, with this end in view.

DEPARTMENTS OF INSTRUCTION.

The number of hours given is the actual number of hours of instruction. Class-room work and lectures require outside preparation, draughting room and laboratory work do not.

FRENCH.

PROFESSOR OWEN, ASSISTANT PROFESSOR GIESE, MISS GAY, AND MR. SEYMOUR.

3. Special Elementary Course for Engineers, essentially as follows: Roman d'un Jeune Homme Pauvre, La Petite Fadette (the former read mainly and the latter altogether independently of the classroom), Le Cid, Le Misanthrope. *Throughout the year; M., Tu., W., Th., F., at 11.* Mr. SEYMOUR.
4. Composition, etc. Written translation into French of the English exercises in Otto's Grammar, oral translation into French of Howard's Aids to French Composition. *Throughout the year; two hours a week.* Miss GAY.
5. Continuation of Course 4. *Throughout the year; two hours a week.* Assistant Professor GIESE.
12. A general course of lectures on French Literature, XVI.—XIX. centuries, with collateral reading. *Throughout the year; M., W., at 12.* Assistant Professor GIESE.

GERMAN.

PROFESSOR ROSENSTENGEL AND MR. MEISNEST.

5. Dippold's Science Reader, Rosenthal's Elektrische Erscheinungen, and Siemen's Elektrische Telegraphie. Required of Freshmen in Engineering. *M., Tu., W., Th., F., at 11.* Mr. MEISNEST.

The aim of this course is to impart a reading knowledge of scientific German, thus enabling students to read German scientific works in connection with their special line of study.

RHETORIC AND ORATORY.

DR. BEATTY, DR. CAIRNS, AND MR. CASKEY.

2. Rhetoric and Composition. Text-books: Abbott's How to Write Clearly, and Cairns' Form and Discourse. *Throughout the year; M., W., F., at 11 and 12.* Dr. BEATTY and Dr. CAIRNS.

Required of freshmen in Engineering.

15. Elocution. Voice training and plain reading and speaking. *First semester; three times a week.* Mr. CASKEY.

Elective for Engineers.

PHYSICS.PROFESSOR SNOW, ASSISTANT PROFESSOR AUSTIN, MR. WOOD, MR. SMITH,
MR. WILDER, AND MR. SHEDD.

1. General Lectures and Introductory Laboratory Practice. Lectures daily at 12 o'clock. Professor SNOW. One recitation by the class in smaller sections at hours to be assigned. Professor SNOW, Mr. FERRY, and Mr. SMITH. Laboratory practice twice a week. *First semester; Tu., Th., 9-1. Second semester; W., F., 2-4.* Assistant Professor AUSTIN, Mr. WOOD. Mr. FERRY, Mr. SMITH and Mr. SHEDD.

The Introductory Physical Laboratory is open daily. Students may therefore make other arrangements as to time, if necessary.

Required of sophomores in Engineering.

4. Precision of Measurements. An advanced laboratory course in Electrical and Magnetic Measurements. Testing and calibration of electrical instruments, and determination of constants. *Three times a week for first semester; M., W., 2-5.* Mr. FERRY.

Required of juniors in Electrical Engineering.

CHEMISTRY.PROFESSOR DANIELLS, ASSISTANT PROFESSOR HILLYER, MR. LINCOLN,
AND MR. BASSETT.

1. Descriptive Inorganic Chemistry and Qualitative Analysis. Lectures and laboratory work. *First semester; M., Tu., W., Th., F., 2-4.*

Second semester: C. E., first twelve weeks, one lecture and six hours laboratory; E. E. and M. E.: one lecture and six hours laboratory work per week for the semester.

MINERALOGY.

ASSISTANT PROFESSOR HOBBS.

2. Mineralogy. A short course adapted to the needs of Engineering students, taken mainly in the laboratory, when with the use of the blow-pipe and study of the physical characters the student is taught to identify minerals. The minerals of economic importance and the common rock builders are the ones given particular attention. *First semester; M., W., 9.*

Required of sophomores in Civil Engineering.

GEOLOGY.

PROFESSOR VAN HISE AND ASSISTANT PROFESSOR CLEMENTS.

1. Part I. General Geology. The geological forces and the work they accomplish; the physiography of North America; rocks and their original and secondary structures. Numerous short excursions. First semester to holiday recess. *M., Tu., W., Th., F., or M., W., F., at 12.* Professor VAN HISE.

Part II. Historical Geology. Special emphasis is given to the history of the North American Continent, including both its physical and life development. Lecture room and laboratory work. First semester from holiday recess. *M., Tu., W., Th., F., or M., W., F., at 12.* Assistant Professor CLEMENTS.

Required of seniors in Civil Engineering. This course is so arranged that it can be taken as a three-fifths or five fifths study for the first semester.

2. Applied Geology. Treats of potable waters, structural materials, soils, mineral fertilizers, mineral fuels, and iron ores. Must be preceded by course 1. Required of seniors in civil engineering. First six weeks of second semester. *M., Tu., W., Th., F., at 12.* Assistant Professor CLEMENTS.

MATHEMATICS.

PROFESSOR SLICHTER, ASSISTANT PROFESSORS SKINNER, MACK, SMITH,
AND MESSRS. RUNNING AND ALEXANDER.

1. Algebra. This course includes progressions, arrangements, and groups, binominal theorem, the theory of limits, undetermined coefficients, logarithms, imaginaries, and

rational integral functions of one variable. Text-book: Van Velzer and Slichter's University Algebra. *First semester; M., Tu., W., Th., F., at 10 (90 hours in class room).* Professor SLICHTER, Assistant Professor SKINNER, and Mr. RUNNING.

Required of freshmen in Engineering.

2. Plane trigonometry. *Part of second semester; M., Tu., W., Th., F., at 10 (36 hours in class room).* Professor SLICHTER and Assistant Professor SKINNER.

Required of freshmen in Engineering.

3. Analytic Geometry. Straight line, conic sections, and introduction to geometry of three dimensions (74 hours in class-room). *Part of second semester; M., Tu., W., Th., F., at 10.* Required of freshmen in Engineering. *Part of first semester; M., Tu., W., Th., F., at 8 and 9.* Required of sophomores in Engineering. Professor SLICHTER and Assistant Professor SKINNER.

4. Calculus. *Part of first semester, and second semester, M., Tu., W., Th., F., two sections, at 8 and 9 (136 hours in class room).* Professor SLICHTER, Assistant Professor SKINNER, and Mr. RUNNING.

Required of sophomores in Engineering.

6. Differential Equations. *Part of second semester; M., Tu., W., Th., F., at 8 or 9 (24 hours in class room).* Professor SLICHTER, Assistant Professor SKINNER, and Mr. RUNNING.

Required of sophomores in Mechanical and Electrical Engineering.

7. Descriptive Geometry. Projection of lines, planes, surfaces, and solids; intersections, tangents to curves and surfaces; problems in warped surfaces; shades and shadows; linear perspective and isometric projection. The class-room exercises are accompanied by work in the draughting room. Text-books: Watson's Descriptive Geometry for the Mechanical and Electrical Engineering courses, and Church's Descriptive Geometry for the Civil Engineering course. Assistant Professors MACK and SMITH, and Mr. ALEXANDER.

FIRST SEMESTER.

Mechanical Eng'r'g Section. *M., W., F., 8-10; Tu., Th., 9.*

Electrical Eng'r'g Section. *M., W., F., 2-4; Tu., Th., 2 and 3.*

Civil Eng'r'g Section. *M., W., 8; Tu., Th., F., 8-10.*

SECOND SEMESTER.

Mechanical Eng'r'g Section. *Tu., 9; W., F., 8-10.*

Electrical Eng'r'g Section. *M., Tu., W., Th., F., 2-4; First nine weeks.*

Required of freshmen in Mechanical and Electrical Engineering.

Civil Eng'r'g Section. *M., Tu., W., Th., F., 8-10; First four weeks. Elective.*

ASTRONOMY.

PROFESSOR COMSTOCK.

6. Astronomical Practice. This course gives training in the theory and use of instruments of precision, and teaches the more important practical applications of astronomy, such as the determination of time, latitude, longitude, and the direction of the meridian. Attention is paid to methods of computation and the numerical treatment of observed data.
7. Method of Least Squares. The subject is treated from the empirical side, and stress is laid upon the application of principles rather than upon the purely mathematical problems which accompany them. *Second semester; M., Tu., W., F., 2-4.*

Elective for juniors in Civil and Sanitary Engineering.

BIOLOGY OF WATER SUPPLIES.

MR. FROST.

1. Biology of Water Supplies. This course is adapted to the needs of students in Sanitary Engineering. It includes a study of the microscopical plants and animals usually found in water supplies; the isolation and cultivation of water bacteria and their relation to disease; the testing of filters and other methods for the purification of waters; and the disposition of sewage by means of sand filtration. *First semester. Full study. Lectures and Laboratory work. Mr. Frost.*

Required of seniors in Sanitary Engineering.

APPLIED MECHANICS.

ASSISTANT PROFESSOR MAURER AND ASSISTANT PROFESSOR RICHTER.

1. Analytic Mechanics. Shaped with special reference to the practical requirements of engineers. Principles rather than formulas are emphasized. Deals with statics, kinematics, kinetics, energetics, centre of gravity, moment of inertia, friction, and units and dimensions of mechanical quantities. *Second semester* (90 hours in class room); M., Tu., W., Th., F., at 8 and 9. Assistant Professor MAURER. Required of sophomores in Engineering.

2. Graphic Statics. Co-ordinated with analytical statics. Applications are mainly the determination of stresses in framed structures under fixed loads, of shear and bending moment in simple beams under fixed and moving loads, and of the centroid and moment of inertia of any plane area. The work consists mainly of draughting. *Second semester* (108 hours in draughting room); M., W., F., 10-12. Assistant Professor MAURER.

Required of sophomores in Civil and Sanitary Engineering.

3. Strength of Materials. The elastic properties of the most important materials of construction from a theoretic standpoint. Applications of theory to practical problems in beams, columns, shafts, riveting, springs, etc. *First semester* (90 hours in class room); M., Tu., W., Th., F., at 10 and 11. Assistant Professor MAURER.

Required of juniors in Engineering.

4. Hydraulics.

(a) Hydrostatic pressure, theory of fluid motion, hydrodynamic pressure; theoretical and experimental formulas for flow through orifices and pipes, over weirs, and in conduits, canals, and streams. *Second semester* (36 hours in class room); Tu., Th., at 10. Assistant Professor MAURER.

Required of juniors in Mechanical and Electrical Engineering.

(b) Same as 4a with water power, and laboratory work additional. *First semester* (2 hours per week in class room; 36 hours in laboratory); Tu., Th., at 9. Assistant Professor MAURER.

Required of juniors in Civil Engineering.

5. Testing of Materials of Construction. Each student is required to make a definite series of tests of wrought iron, cast iron, steel, and wood in tension, compression, bending, and torsion. (*54 hours in laboratory*), *first semester; Tu., Th., 2-5*. Required of seniors in Mechanical and Electrical Engineering. *Second semester; Tu., Th., 8-10; M., 2-5*. Required of juniors in Civil Engineering. Assistant Professor RICHTER.
6. [Graphics. The application of graphic methods of analysis in various departments of mechanics. *First semester, twice a week*; hours to be assigned. Assistant Professor MAURER. Open to graduate students and to students who have completed 1, 2, 3a, or 3b.]
7. Testing Materials. An advanced course will be offered, the special line of work to be agreed upon after consultation with the professor in charge. *M., W., hours to be assigned*. Assistant Professor RICHTER. Open to graduate students and to those students who have completed course 5.
8. Advanced Strength of Materials. The mathematical theory of elasticity with special reference to its application to the constructive materials. *Second semester; twice a week*. Assistant Professor MAURER.

TOPOGRAPHIC AND GEODETIC ENGINEERING.

ASSISTANT PROFESSOR SMITH.

1. Elementary Drawing. Consists of lectures on the care and use of drafting instruments, followed by practical instruction in the free hand lettering of working drawings. Use is made of selected titles from drawings prepared in several of the larger bridge and railroad offices. This work is followed by pen and colored topography and the conventional signs used in map drawing. Text-books: Smith's Topographical Drawing, Smith's Freehand Lettering. *First semester; M., W., F., 2-4*. Required of freshmen in Civil and Sanitary Engineering.
2. Elementary Surveying. (a) The different kinds of chains, tapes, and the construction and adjustments of the compass and level are studied. Areas are measured by

pacing, by chaining, and by use of chain and compass. This is followed by field work in differential and profile leveling. *Second semester; M., W., F., 8-10.*

Required of freshmen in Civil and Sanitary Engineering.

- (b) The construction and adjustments of the transit, sextant, and plane table are first studied; after which practical problems in land surveying are worked. For this purpose 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; and hence the instructor knows beforehand the precise result which the student should obtain. This is an incentive to the student and enables the teacher to show him the degree of accuracy obtained and also to point out errors. Text, Johnson's Surveying. Taught partially in the lecture room, drawing room, and in the field. *First semester; recitations, Tu., Th., at 9. Field work, first nine weeks; (54 hours). Section I, M., W., Th., 10-12. Section II, Tu., Th., F., 10-12.*

Required of sophomores in Civil and Sanitary Engineering.

3. Short Course in Surveying. This course is especially arranged for Electrical and Mechanical Engineers and consists of a condensed treatment of plane surveying. *Second semester; M., W., F., 8-10.*

This course can be taken in either freshman or sophomore years and may be amplified in the following second semester by a 3-5 course in city, mining, and topographic surveying. See T. E. 4.

4. Advanced Surveying. This course is a continuation of course 2b, and includes a study of the higher instruments of precision, and their use in topographic, hydrographic, city, and mining surveying. Each student executes the necessary field work and prepares a map of a topographic or hydrographic survey, also studies U. S. system of land surveys, including the re-establishment of lost section corners and practice in the use of the various instruments and methods for determining the meridian and for running parallels of latitude.

<i>Second semester;</i>	<i>Tu., Th. at 10. First ten weeks.</i>			<i>Last eight weeks</i>
	<i>Field work (50 hours.)</i>	Section I, M., 2-4,		
		W. 2-6.		
		“ II, Sat. 8-1, T., 2-4.		

Required of sophomores in Civil and Sanitary Engineering.

5. Elementary Geodesy. A general treatment of the subject by texts and assigned readings, including the figure of the earth, the apparatus and methods used in measuring base lines; the construction of stations; the method of measuring angles and adjusting triangulation; the principles of projecting maps and a study of the instruments and methods used in spirit and trigonometrical leveling. Text, Johnson's Surveying. *Second semester; M., W., at 10.*

Required of juniors in Civil and Sanitary Engineering.

6. Trigonometrical Survey. This course furnishes the necessary field work for illustrating course 5. Each year a portion of the neighboring lake region will be covered by an accurate triangulation, and also by a topographic and hydrographic survey. The past year the triangulation was connected with the triangulation of the U. S. Coast and Geodetic Survey. The equipment available for this field work includes one 8-inch direction theodolite by Fauth reading to single seconds, one alt-azimuth instrument reading to six seconds, three theodolites reading to ten seconds; six heliotropes; one Kern precise level outfit; one base line apparatus, one sounding apparatus, one tidal gauge, and other instruments needed in such work. Survey begins the Monday of examination week and continues for two weeks (120 hours). Professors, SMITH, WHITNEY, TURNEAURE, and DAVIES.

Required of sophomores and juniors in Civil and Sanitary Engineering.

7. Advanced Geodesy. A general study of the economics of geodesy, also a study of the computations and adjustments of some of the important triangles of the United States Coast and Geodetic Survey. Taught partly by lectures, assigned readings, and in the field. Text-book, Wright's Adjustment of Observations. *First semester. Two hours per week.*

Elective for seniors in Civil Engineering and for graduates

who have taken courses 2, 3, 4, and 5, or their equivalents.

8. Advanced Geodesy. An elaboration of courses 4 and 6. Formulae for computing geographical positions, the theory of the figure of the earth, station error, measurements of gravity, the results of precise leveling considered in connection with warped equipotential surfaces, etc., are studied in detail. Taught by lectures, assigned readings, and in the field. *Second semester. Two hours per week.*

Elective for seniors in Civil Engineering and for graduates who have had courses 2, 3, 4, and 5, or their equivalents.

9. Rapid Topography. This course is designed for training topographers for the U. S. Geological Survey, and for any others who may wish to familiarize themselves with approximate methods of taking topography for small scale maps. It includes a study of origin of topographic forms; analysis of surface lines; personal units as aids in sketching; theory and use of aneroid, barometer, prismatic compass, hand level, odometer, pedometer, clinometer, plane table, etc. Comparative study of scales, and practice in field sketching by ranging and pacing; by traversing; with plane table and vertical angles or stadia. *Second semester. Two hours per week.*

Elective for seniors in Civil Engineering and for others who have had course 2.

10. Mining Surveys. This course will consist of the necessary field and office work of an underground survey of the various University tunnels, aggregating over 3,000 feet in length, including the preparation of a complete map and profile of same. It is believed that the conditions and obstacles to be met and overcome on such a survey will furnish a good substitute for an actual mine survey. An excellent mining transit, recently purchased by the University from Buff & Berger, will be used in this work. *Second semester. [60 field hours.]*

Elective for students who have had Topographic Engineering 2a and 2b.

RAILWAY ENGINEERING.

PROFESSOR WHITNEY.

1. Railway Surveying. A preliminary line about three miles in length is laid out, topography taken adjacent thereto,

and platted. Each member of the class, given certain limits as to grades and curves, makes an independent projection for final location. Approximate estimates of the cost are made, and the best line is located on the ground. All necessary field and office work required to survey and construct such a line is performed. *First semester; F., 2-6; S., 8-12; 144 hours in field and office.*

Required of juniors in Civil and Sanitary Engineering.

2. Preliminary and Location Surveys; Construction. Classroom work to accompany course 1. A good field book is studied part of the time. Lectures and recitations on construction, including rock-work, explosives, tunneling, dredging, and docking. *First semester; Th., at 8; 18 hours in the class room.*

Required of juniors in Civil and Sanitary Engineering.

3. Maintenance of Way. Lectures and recitations on track-work in general, including street railways; freight and passenger yard construction; and standard structures. The various signal and interlocking systems are studied. *Second semester; Tu., Th., at 11; 32 hours in the class room.*

Required of juniors in Civil and Sanitary Engineering.

4. A short course in the above subjects, especially adapted to city and interurban railways, and including masonry constructions and foundations, is offered as an elective to those who have had course 2 T. E. Given partly in the class room, draughting room, and in the field. *First semester; 18 hours in class room, and 36 hours in the field and office.*

5. Railway Economics. A study of the sources of income; operating expenses; relative values of distance, gradient, and curvature, and their influence upon net receipts; classification of locomotives, and their relative power; rolling-stock; and train resistance. Text-book: Wellington's Economic Theory of Railway Location. *First semester; Tu., Th., at 11; 36 hours in the class room.*

Required of seniors in Civil Engineering.

6. Railway Standards. Continuation of courses 3 and 5. It is intended to give the student some degree of familiarity with designing various railway standards. The work is carried on in the draughting room, aided by careful study

of numerous blue prints of the standards of the best railways. *First semester.*

Elective for seniors in Civil Engineering, and for graduates.

7. Tunneling and Substructures. The various methods of tunneling, shaft-sinking, ordinary and deep-foundation work are studied, principally from reports of the engineers in charge as contained in the transactions of engineering societies and technical journals. The best of such reports are selected for the students to study and report upon. References: Drinker's Tunneling and Patton's Foundations. *Second semester; M., W., at 9; 32 hours in the class room.*

Required of seniors in Civil Engineering.

8. Municipal Railways. A course of lectures and assigned readings on the location, construction, maintenance, operation, and traffic of elevated, surface, and underground lines of railway. *Second semester.*

Elective for seniors in Civil Engineering and for graduates. For course in railway transportation, course 10 in Economics, see p. 88.

This course on the historical, economic, and legal aspects of the subject is offered as an elective to seniors and graduates in Civil Engineering.

RIVERS AND CANALS.

PROFESSOR WHITNEY.

1. River and Harbor Improvement and Canal Construction. Lectures and assigned readings on the early history of transportation in the United States; on the artificial improvements of rivers and harbors for navigation and protection; and on the construction, operation, and traffic of canals in the United States and abroad. *Second semester; M., W., and F., at 11 for the last half of the semester; 24 hours in the class room.*

Required of seniors in Civil Engineering.

HYDRAULIC ENGINEERING.

PROFESSOR BULL AND ASSISTANT PROFESSOR RICHTER.

1. Hydraulic Motors and Pumping Machinery. The theory of the various kinds of turbines is first given, followed by

rules for their design, based upon both theory and practice. The course concludes with a short study of pumping machinery. *Second semester; M., Tu., Th., at 12, (50 hours in class room).* Professor BULL.

Required of seniors in Mechanical and Electrical Engineering.

2. Hydraulic Laboratory. Special attention is given to the testing of turbine wheels, water meters, and other hydraulic machinery, in connection with the determination of the coefficients of the flow of water through pipes, orifices, and over weirs. *(20 hours in laboratory.)* Assistant Professor RICHTER.

Required of seniors in Mechanical and Electrical Engineering.

STEAM ENGINEERING.

PROFESSOR BULL, ASSISTANT PROFESSOR RICHTER, AND MR. ALEXANDER.

1. Thermodynamics. This course covers those principles of the mechanical theory of heat which are preliminary to the study of the various kinds of heat engines. The course is intended to be very thorough, especially with reference to steam. Text-book: Peabody's Thermodynamics of the Steam Engine. *First semester; first twelve weeks; M., Tu., W., Th., F., at 12 (60 hours in class room).* Professor BULL.
Required of juniors in Mechanical Engineering.

2. Theory of Heat Engines. In this study, practical yet scientifically correct formulas for computing the diameter and stroke of the steam engine are deduced. The influence of clearance, jacketing, cylinder condensation, wet and superheated steam are considered. The theory of the compound and triple engines are given, as well as the results from practice in this direction. At the end of the course the subjects of compressed air and of refrigerating machinery are taken up. The study is partly given by lectures; for part of the work Peabody's Thermodynamics is used as a text-book. *First semester; last six weeks; M., W., F., at 12. Second semester; first nine weeks; daily at 8. (75 hours in class room).* Professor BULL.

Required of juniors in Mechanical Engineering.

3. Steam Boilers. The general subject of combustion and its application to steam boilers is studied, the theoretical and practical efficiency of those is developed, and rules for the design of boilers, chimneys, etc., are given. Text-book: Peabody and Miller's Steam Boilers, but the study is partly taught by lectures. *Second semester; M., W., F., at 11, (54 hours in class room).* Professor BULL.

Elective; open to all who have had either course 1 or 5.

4. Design of the Steam Engine. In this course the diameter, stroke, and number of revolutions of the engine are assumed to be known, as well as the steam pressure, cut-off, compression, etc., and from these data the other dimensions are either computed or deduced according to practice. Special attention is given to the various kinds of valve gears, to the fly-wheel, governor, and reciprocating parts, and their relation to each other. The study is taught principally by lectures, although Peabody's Valve Gears for Steam Engines is used as a text-book for part of the time. The work in the class room is supplemented by the work in the draughting room, where each student is required to work out a complete problem. Class work: *Second semester, junior year; last 9 weeks; M., Tu., W., Th., at 8; first semester, senior year; M., W., at 10; second semester, senior year; M., W., F., at 10 (126 hours in class room).* Draughting: *Second semester, junior year; last 9 weeks; M., W., 2-4; first semester, senior year; Tu., Th. 9-11; second semester, Tu., Th. 10-12 (180 hours in draughting room).* Professor BULL.

Required of juniors and seniors in Mechanical Engineering.

5. Short courses in Thermodynamics and the Theory of the Steam Engine. Only the fundamental principles of thermodynamics can be touched upon in this course, but to a sufficient degree to enable the student to study the steam engine and boiler intelligently. The theory of the steam engine is given to the exclusion of all other heat engines. The text-book used is Peabody's Thermodynamics, but a part of the study is given by lectures. *Second semester; daily at 8 first ten weeks; M., W., F., at 8 last eight weeks, 74 hours.* Assistant Professor RICHTER.

Required of juniors in Electrical Engineering.

6. Short Course in Steam Engine Design. The course is intended for electrical engineering students, and in it only the most important parts of the modern steam-engine as applied in the service of electricity, such as the valve gear, fly-wheel, governor, etc., will be touched upon. Most of the work will be done in the class-room, but occasionally exercises will be conducted in the draughting-room. *First semester; (54 hours in class room).* Professor BULL.

Elective for seniors in Electrical Engineering.

7. Course in Steam Engineering for Civil Engineers. In this course the stress will be laid on the steam engine and boiler, and but very little time will be spent on thermodynamics. It will be the aim of the course to impart sufficient knowledge to the students that they may understand the working of the steam engine thoroughly, and also be able to make a good selection of an engine and boiler for specified purposes. *First semester; first 12 weeks, M., W., F., at 11; 36 hours.* Mr. ALEXANDER.

Required of juniors in Civil Engineering, and of seniors in Sanitary Engineering and in the course of Applied Electro Chemistry.

8. Long Laboratory Course. For this study the compound experimental engine of the laboratory and the fifty-horse power Root boiler, besides the various other smaller engines and the gas and hot air engines owned by the department, are used with all the necessary appliances for making complete tests of engines and boilers. Stress is laid upon the necessary calibration of all instruments used in the test, for which work the department has all the necessary appliances. Each student is required to perform all of the various operations necessary for conducting an accurate trial. At the end of the course, the class makes a complete twenty-four hour test of a large power plant not connected with the University. The department also owns a large number of injectors, pumps, and other boiler appliances, of which accurate tests are made. The methods are explained in connection with the class work of thermodynamics. *Four hours per week.* Assistant Professor RICHTER.

The study begins with the 13th week of the first semester, junior year, and ends with the first semester of the senior year.

Required of Mechanical Engineers. Also required of Electrical Engineers from the 11th week of the second semester, junior year, to the end of the first semester, senior year.

9. Short Laboratory Course. This course is intended for civil engineering students, and is more elementary than the long course in boiler and engine testing. The student will, however, learn enough to conduct an ordinary commercial test of a pumping engine. *Six hours per week during the last six weeks of the first semester; M., W., F., 11-1.* Mr. ALEXANDER.

Required of juniors in Civil Engineering, of seniors in Sanitary Engineering and in the course of Applied Electro Chemistry.

10. Advanced Course in Steam Engineering. Thurston's Handbooks on the Steam Engine and on the Steam Boiler will be used in this course; but the study will be prosecuted principally by means of lectures and assigned readings of the various works on steam engineering. *First and second semester; M., W., F.,* the hours to be assigned after consultation. Professor BULL. Open to graduate students and to those students who have completed the courses 1, 2, 4, and 8 in Steam Engineering.

11. Advanced Course in Laboratory Work. An advanced course will be offered in any of the different lines of experimental work, to conform with the special line of work the student wishes to follow. Stress will be laid on original research and investigation. *Tu., Th.,* the hours to be assigned. Assistant Professor RICHTER.

Open to graduate students and to those students who have completed the required courses in the line they wish to follow.

12. Heating and Ventilation. R. C. Carpenter's book on this subject will serve as the groundwork in this study. But assigned readings of the literature in this branch of Engineering, as well as lectures on special topics, will supplement the instruction. *First semester; Tu., Th., at 11; 36 hours.* Professor BULL.

12. Heating and Ventilation. R. C. Carpenter's book on this Required of seniors in Sanitary Engineering.
13. Gas and Gasolene Engines. These important motors will be treated both from a theoretical and an experimental point of view. The subject will be taught partly by lectures and partly by assigned readings of the current literature. *Second semester; M., W., at 9; 36 hours.* Professor BULL.

ELECTRICAL ENGINEERING.

PROFESSOR JACKSON, ASSISTANT PROFESSOR SWENSON, MR. BURGESS, AND
MR. BEEBE.

Applied Electro-Magnetism and the Construction of Dynamos.

1. Electromagnets and Dynamos. A discussion of the simple forms of electromagnets; the development of the laws of magnetization by electric currents; the laws of simple magnetic circuits and the windings of electromagnets; the practical design, construction, and testing of dynamos. Jackson's *Electromagnetism and the Construction of Continuous-Current Dynamos. Three times a week throughout the year. (108 hours in class room and 36 hours in draughting room).* Assistant Professor SWENSON.

Required of juniors in Electrical Engineering and Applied Electro-Chemistry.

2. Testing Direct Current Dynamos and Motors. The testing and operation in the laboratory of direct current generators, motors, and accessory apparatus. *Twice a week throughout the year. (144 hours in the laboratory.)* Mr. BEEBE.

Required of juniors in Electrical Engineering and Applied Electro-Chemistry.

Required of seniors in Mechanical Engineering during first semester.

3. Electrical Machinery and Appliances. A short course in the theory, construction, and testing of generators, motors, transformers, etc. Hawkin's and Wallis' *The Dynamo*, supplemented by notes by the Professor. *Three times a week during first semester and twice a week during second*

semester. (90 hours in the class room.) Assistant Professor SWENSON.

Required of seniors in Mechanical Engineering during first semester and elective during second semester.

4. Advanced Design and Construction of Large Direct-Current Dynamos. By seminary method, following the treatment of the subject outlined by Fischer-Hinnen and E. Arnold. This course includes the working out of complete designs and may be elected either as a three or five hour course through the year. Assistant Professor SWENSON.

Open to graduates and others who have had the equivalent of courses 1 (or 3) and 2.

ALTERNATING CURRENTS AND ALTERNATING CURRENT MACHINERY.

1. Theory and Application of Single-Phase Alternating Currents. The theory of the generation and utilization of alternating electric currents; the design, construction and operation of single-phase alternating current dynamos and transformers; and methods for testing alternating current machinery. Jackson's Alternating Currents and Alternating Current Machinery. *Three times a week during first semester and twice a week during second semester. (90 hours in the class and draughting room.)* Professor JACKSON.

Required of seniors in Electrical Engineering and Applied Electro-Chemistry. Elective for graduates.

2. Testing Alternating Current Machinery and Appliances. The testing and operation in the laboratory of single-phase alternating current generators, motors, transformers, meters, and other appliances. *Twice a week throughout first semester. (72 hours in the laboratory.)* Mr. BEEBE.

Required of seniors in Electrical Engineering and Applied Electro-Chemistry. Elective for graduates.

3. Elementary Polyphase Currents. Following the treatment in Jackson's Alternating Currents and Alternating Current Machinery. *Twice a week throughout second semester. (36 hours in class room.)* Professor JACKSON.

Open to students who have had the equivalent of courses 1 and 2.

4. Testing Polyphase Machinery and Appliances. *Twice a week throughout second semester. (72 hours in the laboratory.)* Mr. BEEBE.

Open to students who are pursuing or have completed course 3.

5. Elementary Theory of Alternating Currents. This course is designed for advanced students in applied mathematics and physics who desire to obtain a reasonably brief treatment of alternating currents and the properties of alternating current circuits without entering upon the design, construction and testing of machinery. *Twice a week throughout the year.* Professor JACKSON.

Open to seniors and graduates.

6. Advanced Alternating Currents (including Polyphase Currents and Machinery). A study, by seminary method, of the treatments of Rodet, Kraemers, Steinmetz, and Loppé et Bouquet, with lectures which treat in detail the properties of alternating current circuits and machinery. *Three times a week throughout the year.* Two hours of laboratory work may be elected in addition. Professor JACKSON.

Open to graduates and others with requisite preparation.

APPLIED ELECTRO-CHEMISTRY AND ELECTRO-METALLURGY.

1. Primary and Secondary Batteries. Batteries as a source of electricity; theory, construction, and working of primary and secondary batteries and their commercial use.
2. Electrolysis and Electrometallurgy. The theory and application of electrolysis and electrometallurgy. Industrial electrochemistry, the treatment of ores, electrolytic separation and refining of metals, electrotyping, and electroplating.

Must be preceded by courses in chemistry.

Five times a week throughout first semester; (54 hours in class room and 72 hours in laboratory). Mr. BURGESS.

Open to seniors and graduates.

Required of seniors in Applied Electro-Chemistry.

3. Applied Electro-Chemistry. One lecture per week on special applications of electricity in chemical and metallurgical

operations. Sufficient laboratory work of an independent nature will be taken up to fulfill the requirements of a 3-5 or 5-5 study, as desired. *Three or five times a week throughout second semester.* Mr. BURGESS.

Open to graduates and others who have completed courses 1 and 2.

Required of seniors in Applied Electro-Chemistry.

4. Electricity as Applied to the Treatment of Metal Surfaces. Electrolytic principles applied to corrosion of metals, and methods for preventing corrosion, including electroplating and galvanizing; also electricity applied to cleaning metals. *Once a week throughout first semester.* Elective for students in Civil and Mechanical Engineering. Mr. BURGESS.

ELECTRICAL INSTALLATIONS.

2. Electrical Testing. Treats of the construction, testing, maintenance, and operation of lines and appliances, used in telephony, telegraphy, and electric signalling. *Three times a week throughout second semester. (18 hours in class room and 54 hours in laboratory).* Mr. BURGESS.
Required of juniors in Electrical Engineering.

3. Testing Wires and Cables. Laboratory practice in insulation and breakdown tests, location of faults, testing insulators, etc. Study of the phenomena produced by high pressures on electric circuits. *Twice a week throughout either semester.* Mr. BURGESS.

Open to seniors and graduates.

4. Electric Lighting and Transmission of Power. A study of the location, erection, and cost of transmission and distribution lines; the application of electric motors to the general purpose of power distribution; the use of incandescent and arc lamps; and the problems of long distance transmission of power by electricity. *Three times a week throughout second semester.* Mr. BURGESS.

Open to seniors and graduates. Required of seniors in Applied Electro-Chemistry.

5. Graduate Conference. A conference or seminary for the detailed study of engineering problems.

6. Electric Railways. The road-bed, rolling-stock, electric circuits, and power plants for city, town, and suburban railways; the location and construction of street railways in cities and towns; track foundation and types of rail; selection of cars and motors to be used under different conditions; methods of conveying the electric current from the generator to the motors; and the best methods for meeting the severe conditions imposed on electric railway power plants. Lectures based on notes by the professor. *Three times a week throughout second semester.* Assistant Professor SWENSON.
Open to seniors and graduates.
7. Electricity in Mining and Quarrying. A discussion of the practice in mining and quarrying where electricity can be satisfactorily applied and the advantages and limiting conditions of long-distance transmission of power by electricity from water power to mines. *Once a week throughout first semester.* Professor JACKSON.
Open to seniors and graduates.
8. Central Station Design, Management, and Estimates. The selection and arrangement of machinery for generating plants; effect on operating expenses of the arrangement of power and generating plants and circuits, and the use of meters; estimating costs of power and generating plants, and the cost of lines and weights of copper. *Twice a week during first semester, and three times a week during second semester.* Professor JACKSON.
Open to seniors and graduates.
9. Inspection Tours. An inspection tour is made at the Easter recess and another at the end of the second semester. Each student is expected to accompany two of the parties during the last two years of his course if possible. The tours comprise visits to Chicago, Milwaukee, and other manufacturing centers, for the purpose of inspecting manufacturing plants and great engineering works under operation or construction.
10. Illumination and Photometry. A study of light sources; the manufacture and use of incandescent and arc lamps; the selection, arrangement, and relative economy of light sources under various conditions; the practical testing of the luminous intensity and efficiency of light sources,

and the illumination of streets and interiors. *Second semester; twice a week. (18 hours in class room and 36 hours in laboratory).* Assistant Professor SWENSON.

Open to seniors and graduates.

11. Elements of Electric Lighting and Power Distribution. A short general course particularly designed for students in civil engineering, treating of the theory, testing, and use of electrical machinery and appliances; the various methods of power distribution; the construction of distributing lines; and the application of electric motors to hoisting machinery and other purposes. A special short laboratory course in testing electrical machinery and appliances is given in conjunction with this course. *Four times a week second semester; two times a week first semester.* Assistant Professor SWENSON.

Open to juniors and seniors.

STRUCTURAL ENGINEERING.

PROFESSOR TURNEAURE AND PROFESSOR WHITNEY.

1. Structural Details. The designing of simple forms of members and of joints in wood and iron, and of wooden roof and bridge trusses. *First semester; Tu., Th., 11-1.* Professor TURNEAURE.

Required of juniors in Civil Engineering.

2. Masonry Construction and Testing of Materials.

(a) Theory governing the design of masonry structures, as dams, retaining walls, piers, and abutments; foundations. *Second semester; Tu., Th., at 10; 36 hours in class room.* Professor WHITNEY.

Required of juniors in Civil and Sanitary Engineering.

(b) Testing of hydraulic cements, paving bricks, and stone. *Second semester; Th., 2-5; 48 hours in the laboratory.* Professor WHITNEY.

Required of juniors in Civil and Sanitary Engineering.

3. Engineering Architecture. Treats of those principles of artistic design applicable to engineering structures, especially those of masonry. *Second semester; four lectures in connection with course 4.*

4. Masonry, Arches, Dams, and Stereotomy.

(a) Arches. A discussion of the theory of the stability of masonry arches, both right and oblique, is followed by the complete design of an arch. Specifications and estimates of cost are furnished. Most of the time is spent in the draughting room. *Second semester; F., 8-10, 24.*

Required of juniors in Civil and Sanitary Engineering.

(b) Dams; Stereotomy. A design for a high masonry dam is made, followed by several problems in stereotomy. Reference is made to the works of Krantz, Rankine, Wegmann, and Warren. *First semester; M., W., F., 10-12, principally in the draughting room. Professor WHITNEY.*

Required of juniors in Civil and Sanitary Engineering.

5. Bridge Stresses. The instruction in this subject is given by text-book, together with the working of numerous problems. Text-book: Johnson, Bryan, and Turneaure's Modern Framed Structures.

(a) Simple Bridge Trusses. Determination of stresses by both graphical and analytical methods in the modern types of trusses, for uniform, and for concentrated moving loads. *Second semester; M., W., F., at 11. 48 hours in class room. Professor TURNEAURE.*

Required of juniors in Civil and Sanitary Engineering.

(b) Suspension, Swing, Cantilever, and Arch Bridges; deflection formulæ and stresses in redundant members. *First semester; M., W., 9; 36 hours in class room. Professor TURNEAURE.*

Required of seniors in Civil Engineering.

6. Bridge Design. Location and economic length of span, formulæ for working stresses, design of individual truss members, combined and secondary stresses, and questions relating to the designing of details. *First semester; F., at 9; 18 hours in class room. Professor TURNEAURE.*

Required of seniors in Civil and Sanitary Engineering.

7. Designs and Estimates. In this course each student makes a complete design of one structure of each class mentioned below in accordance with some standard specifications, prepares detail drawings and makes an estimate of the quantity of material and cost; complete working drawings are made of at least one structure. Stiffness as well as strength is aimed at, and special attention is given to

the proper distribution of stress into members at joints and to questions relating to economy of manufacture. Constant use is made of the large collection of drawings belonging to the department.

- (a) Roof Trusses and Plate Girders. *Second semester; M., Tu., Th., 8-10; 96 hours in draughting room.* Professor TURNEAURE.

Required of juniors in Civil and Sanitary Engineering.

- (b) Riveted and Pin-Connected Trusses. *First semester; Tu., Th., 8-11; 96 hours in draughting room.* Professor TURNEAURE.

Required of seniors in Civil and Sanitary Engineering.

- (c) Swing Bridges. Design of truss and turn-table with specifications for material and manufacture and for the operating machinery. *First semester; 72 hours in the draughting room.* Professor TURNEAURE.

Elective for seniors and graduates in Civil Engineering.

8. Bridge Specifications, Construction, and Testing. The first part of this course is devoted to a critical study of specifications for bridge structures, results and methods of testing of material and of full-sized bridge members and complete structures. A brief study is then made of bridge construction, including mill-work, shop-work, inspection and erection. The last four weeks of the course are spent in making actual tests on bridges under moving train loads by means of the Fraenkel apparatus. The members of the class are assigned various parts of the bridge and the results of the experiments are worked up and the observed stresses compared with the computed. *Second semester; Tu., Th., at 10; two-fifths study.* Professor TURNEAURE.

Elective for seniors and graduates in Civil Engineering.

9. Structural Design. Short general course in the designing of roofs and buildings. *Second semester; 96 hours in the draughting room.* Professor TURNEAURE.

Elective for students in Electrical and Mechanical Engineering who have had Mechanics 3.

10. Secondary Stresses. For graduate students. See p. 000 of the Graduate Circular.

MUNICIPAL AND SANITARY ENGINEERING.

PROFESSOR TURNEAURE AND PROFESSOR WHITNEY.

1. Water Supply Engineering. Sources of supply, collection, and storage of water; interpretation of chemical and biological analyses; purification and distribution of water, including the study and design of filtering plants, reservoirs, standpipes, pumping stations, and distributing systems. Lectures, problems, and assigned reading. *First semester; M., W., F., at 8; 54 hours in class room.* Professor TURNEAURE.

Required of seniors in Civil and Sanitary Engineering.

2. Sanitary Engineering. Design and construction of sewerage and drainage systems; house drainage; street cleaning; sewage and garbage disposal, and the design of disposal works. Lectures, recitations, and designs. *Second semester; M., W., F., at 10; 48 hours in class room.* Professor TURNEAURE.

Required of seniors in Civil and Sanitary Engineering.

3. Designs of Water Supply and Sewerage Systems. Complete designs and estimates of water supply and sewerage systems, and purification plants. *First and second semesters; W., 2-6.* Professor TURNEAURE.

Required of seniors in Sanitary Engineering; elective for others.

4. Roads and Pavements. Lectures and assigned readings on the location, construction, and maintenance of country roads and city pavements. *Second semester; M., W., F., at 11; 27 hours in the class room for first half of the semester.* Professor WHITNEY.

Required of seniors in Civil and Sanitary Engineering.

For course in Biology of Water Supplies see page 216; and for course in Municipal Railways see page 223.

These courses are elective for seniors and graduates in Civil Engineering.

MACHINE DESIGN.

PROFESSOR JONES AND ASSISTANT PROFESSOR MACK.

1. Elementary Drawing. The work begins with sketching of machine parts and making of complete drawings from the sketches. The parts selected for this purpose are

from machines of practical utility, having correct proportions and outlines. The various methods of arranging the plan and elevations relatively to each other on the paper, and of selecting such views and sections as will give the clearest representation of the part with the least amount of drawing, are studied with a view to economising time especially, and, in a minor degree, space, without sacrificing clearness. *First semester; (108 hours draughting).* M., W., Th., 10-12. Assistant Professor MACK.

Required of sophomores in Mechanical and Electrical Engineering.

2. Draughting, Tracing, and Blue Printing. During this course drawings are made from machines, models, and plates, the object being to give the student a general idea of the forms of machine parts, and the methods of putting them together. When plates are used they are as far as possible duplicates of drawings in use for construction in the best machine building establishments of the present time. Standard plates are used to illustrate combinations not shown by the above methods. Finally, an entire machine of moderate complexity is taken as a model, from which complete working drawings are made. Line shading, tracing, and blue-printing are taught in this course. *Second semester; (108 hours draughting).* M., W., F., 10-12. Assistant Professor MACK.

Required of sophomores in Mechanical and Electrical Engineering.

3. Kinematics of Mechanisms. This is a study of the relative motions of machine parts, including belting, toothed gears, cams and linkages. The method of finding the velocity and direction of motion of any point in a mechanism at any instant, by means of instantaneous and virtual centres, is studied and applied to such machines as shapers, and to determining the correct forms of gear teeth. The class-room work is supplemented by a parallel course of drafting. A set of kinematic models representing the most important and most commonly used parts of machines, purchased in the spring of 1899, will greatly facilitate the instruction in this subject. Text-book: Machine Design, Part I., by Forrest R. Jones. *First semester; (two hours of lectures and recitations, and*

eight hours draughting a week). Lectures, Tu., Th., 10; draughting, Tu., W., Th., F., 8-10. Professor JONES and Assistant Professor MACK.

4. Crane Design and Graphic Statics of Mechanisms. A simple form of crane is selected to design for the reason that the stresses in its parts can be determined with more accuracy and certainty than in any other machine in common use, and it therefore affords the best example of the combination of theoretical and practical considerations affecting the design of a machine. The parts are studied in detail in the class-room, and the complete crane is designed in the drafting room. After the study of this machine is completed, the class-room work is directed toward the investigation of the stresses in the frames of other forms of cranes, and to the static stresses induced in other machines when in operation. The latter part of the work covers various forms of machines selected with a view to making the instruction of as wide a range as possible. Notes by the instructor and "Notes and Examples in Mechanics" by Irving P. Church. This work must be preceded by the course in mechanics required of students in mechanical and electrical engineering. *Second semester; (three hours of lectures and recitations, and ten hours draughting a week)*. Lectures, M., W., F., 10; draughting, daily, 11-1. Professor JONES and Assistant Professor MACK.
- Required of juniors in Mechanical Engineering.

5. Machine Elements and Power Transmission Devices. The form, strength, and proportions of the frames and moving parts of machines, as determined by combined theoretical and practical considerations, are studied in connection with the stresses due to the load supported, the moving parts, and the work done by the machine. The design of the frames of punching, shearing, and riveting machines, which are subjected to heavy stresses, is given especial attention. The elementary parts of machines, such as screw fastenings, riveted joints, journals, bearings, and sliding surfaces, are studied in detail together with power transmission devices comprising screws, gears, belts, ropes, and shafting. The design and efficiency of complete mechanical power transmission

systems are studied, comparisons being made with other methods of transmitting power and energy. The selection of materials with regard to their adaptability, first cost, and cost of bringing into the finished form, comprises a considerable portion of this work. Most of the time is spent in the class-room, but some problems are assigned which must be solved in the draughting room. Text-book: Machine Design, Part II., by Forrest R. Jones. *Throughtout the year. (Five hours a week.) First semester; daily, 11-1. Second semester; daily, 8-10.* Professor JONES.

Required of seniors in Mechanical Engineering.

6. Seminary. There are numerous subjects relating to mechanical engineering, each of which may be comparatively small in itself, but without a knowledge of which the engineer is greatly handicapped in the application of his profession. Such subjects can be most advantageously studied by reading, in the published transactions of engineering societies, and in the abundant engineering literature, the best articles relating to them, and then bringing out the essential features by discussion. With this object in view, the seminary is conducted by assigning to each student a subject and giving him references to published papers relating to it, from which he compiles a paper and reads it before the class, occupying a portion of the hour. General discussion by the students and instructor then follows, during the remainder of the period. *First semester. (Two hours a week.)*

Elective for seniors.

7. Patent Office Drawing. A course giving practice in the preparation of drawings as required by the U. S. Patent Office. Open to all who have had courses 1 and 2. *Second semester. (Two hours drawing a week.)* Assistant Professor MACK.
8. Hoisting and Conveying Machinery. A course dealing in a general way with traveling and swinging cranes, elevators, moving platforms, grain conveyors, pneumatic and hydraulic hoists, etc., with a view toward determining the nature of service to which each is adapted and which should be selected to fulfill a given combination of requirements. *Second semester. (One hour a week in the class room.)* Professor JONES,
Elective,

9. Complete Machines. Especially intended for those who wish to make a study of the design of some particular machine, which may be selected by the student. The work must necessarily be done entirely in the draughting room. *First semester. (Six hours draughting a week.)* Professor JONES.
Elective.
10. Advanced Kinematics. This consists of a study of irregular, intermittent, and variable motion mechanics, such as are applied to printing presses, paper mill machinery, weaving looms, etc., and an advanced study of machinery for the transmission of motion and power. The mechanisms and devices taken up are those used in practice to a considerable extent, although not so commonly as those studied earlier in the course. *Second semester. Hours arranged as found convenient.* Professor JONES.
Elective.

SHOP-WORK.

PROFESSOR KING, MR. HARGRAVE, MR. FENNELL, MR. MUTCHLER, MR. LOTTES, AND MR. BONN.

1. Bench and Machine Work in Wood.
- (a) A systematic course in the use of the plane, saw, gouge, bit, and kindred tools. This covers the principles of joining and joint work involved in building construction. Lectures each day precede new operations. Exercises in free-hand sketching are required three times a week.
 - (b) Systematic training at the lathe in the use of the gouge and chisel in plain and ornamental turning in hard and soft wood. Lectures and sketching as before. (90 hours.) *First semester; M., W., F., 8-10; and W., Th., F., 2-4.* Professor KING and Mr. MUTCHLER.
Required of freshmen in Mechanical and Electrical Engineering.
Second semester; M., Tu., W., Th., F., 2-4.
Required of freshmen in Civil Engineering.
2. Foundry Work. Practice in pattern making and moulding. The patterns chosen are those giving the best illustration of the principles involved in their construction and in the methods of moulding. Lectures on these subjects

and on the methods of core making and core work are given with this course. Free-hand sketching is required. *Second semester*; M. E.; M., F., 2-4; Tu., Th., 8-10; S., 11-1; E. E.; W., F., 8-10; S., 8-1 (20 hours). Professor KING and Mr. BONN.

Required of freshmen in Mechanical and Electrical Engineering.

3. Bench Work in Iron. Embraces practice in wrought and cast iron with the hammer, chisel, and file at the vise. *Second semester*; M. E.; M., F., 2-4; Tu., Th., 8-10; S., 11-1; E. E.; W., F., 8-10; S., 8-1; (30 hours). Professor KING, Mr. HARGRAVE, and Mr. FENNELL.

Required of freshmen in Mechanical and Electrical Engineering. Required of freshmen in Civil Engineering. *Second semester, daily*, 2-4 (20 hours).

4. Production of Flat Surfaces and Straight Edges. Training in the use of file and scraper on surfaces of large area. Lectures treating of the lathe and milling machine. *Second semester*; M., F., 2-4; Tu., Th., 8-10; S., 11-1; E. E.; W., F., 8-10; S., 8-1 (20 hours). Professor KING, Mr. HARGRAVE, and Mr. FENNELL.

Required of freshmen in Mechanical and Electrical Engineering.

5. Machine Work in Iron. Practice on the engine lathe, in connection with which are taught the elementary features of boring, turning, and screw cutting. Lectures on these subjects weekly. *Second semester*; M. E.; M., F., 2-4; Tu., Th., 8-10; S., 11-1; E. E.; W., F., 8-10; S., 8-1; (40 hours). Professor KING, Mr. HARGRAVE, and Mr. FENNELL.

Required of freshmen in Mechanical and Electrical Engineering.

6. Practice on the Planing and Milling Machines. Gives some knowledge of the variety of work which may be done on these machines and a comparison of the time required for the same work on the two machines. *Second semester*; M. E.; M., F., 2-4; Tu., Th., 8-10; S., 11-1; E. E.; W., F., 8-10; S., 8-1; (68 hours). Required of freshmen in Mechanical and Electrical Engineering. Professor KING, Mr. HARGRAVE, and Mr. FENNELL.

7. Forge Work. Training in the fundamental features of forge practice, as drawing, upsetting, bending, welding, tool making, and tempering. *First semester*; M. E.; M., F., 9-12; E. E.; F., 9-11; S., 8-12; (50 hours). Required of

sophomores in Mechanical Engineering. Required of sophomores in Electrical Engineering (40 hours). *Second semester; M., Tu., W., Th., F., 2-4 (80 hours)*. Required of freshmen in Civil Engineering. Professor KING and Mr. LOTTES.

8. Practice at the Lathe and Milling Machine. This includes instruction in the methods of determining the diameter of blanks for spur, bevel, spiral, and tangent wheels on the lathe, and in cutting the teeth with the milling machine. *First semester; M. E.; M., F., 9-12; (58 hours)*. Required of sophomores in Mechanical Engineering. E. E.; *Tu., 9-11; S., 8-12; (68 hours)*. Required of sophomores in Electrical Engineering. Professor KING and Mr. HARGRAVE.
9. Tool making. The methods of making taps and dies for cutting screw threads are the prominent features. Some instruction in brass work is also given. *First semester; W., F., 2-5:30, and M., 8-10; S., 9-1. (68 hours)*. Required of juniors in Mechanical Engineering. Required of juniors in Electrical Engineering (20 hours). Professor KING and Mr. HARGRAVE.
10. Machine Construction. Attention is given to the cost of production. *First semester; M. E.; W., F., 2-5:30; E. E.; M., 8-10; S., 9-1; (58 hours)*. Required of juniors in Mechanical Engineering. (70 hours). Required of juniors in Electrical Engineering. Professor KING and Mr. HARGRAVE.
11. Machine Construction. Attention is given to the cost of production. *Second semester; W., 2-4; F., 2-6; (108 hours)*. Required of juniors in Mechanical Engineering. Professor KING and Mr. HARGRAVE.
12. Construction and Pattern Work. Practice in pattern work, and fitting together machine parts. This will require also some moulding and forge work, including tool dressing and tempering. *First semester; M., W., 2-5 (108 hours)*. Professor KING, Mr. HARGRAVE, and Mr. LOTTES.
Required of seniors in Mechanical Engineering.
13. This course is similar to course 10, but to it will be added practice in the erection of line shafting and machinery. Lectures on the last two subjects and Mechanical Practice in the development of the Locomotive. *Second semester; Th., 2-6; F., 11-1 and 2-6 (180 hours)*. Professor KING and Mr. HARGRAVE.
Elective for seniors in Mechanical and Electrical Engineering.

COLLEGE OF AGRICULTURE.

STAFF OF INSTRUCTION AND RESEARCH.

- C. K. ADAMS, LL. D., President of the University.
W. A. HENRY, AGR. B., DEAN, Professor of Agriculture.
S. M. BABCOCK PH. D., Professor of Agricultural Chemistry.
W. L. CARLYLE, B. S. A., Professor of Animal Husbandry.
E. S. GOFF, Professor of Horticulture and Economic Entomology.
F. H. KING, Professor of Agricultural Physics.
F. W. WOLL, M. S., Assistant Professor of Agricultural Chemistry.
H. L. RUSSELL, PH. D., Professor of Bacteriology.
E. H. FARRINGTON, M. S., Associate Professor of Dairy Husbandry.
J. A. JEFFERY, B. S., Assistant Professor of Agriculture.
GEORGE MCKERROW, Superintendent of Farmers' Institutes.
R. A. MOORE, Assistant to Dean. In charge of Short Course.
J. W. DECKER, AGR. B., Instructor in Cheesemaking.
ALFRED VIVIAN, PH. G., Assistant Instructor of Agricultural Chemistry.
SIMON BEATTIE, D. V. S., Instructor in Veterinary Science.
R. A. HARPER, PH. D., Professor of Botany.
E. A. BIRGE, PH. D., SC. D., Professor of Zoology.
J. C. W. BROOKS, Professor of Military Science and Tactics.
W. W. DANIELLS, M. S., Professor of Chemistry.
W. D. FROST, M. S., Instructor in Bacteriology.
D. B. FRANKENBURGER, A. M., Professor of Rhetoric.
H. W. HILLYER, PH. D., Assistant Professor of Organic Chemistry.
C. I. KING, Professor of Practical Mechanics.
A. W. RICHTER, M. E., Assistant Professor of Experimental Engineering.
W. H. ROSENSTENGEL, A. M., Professor of German.
W. A. SCOTT, PH. D., Professor of Economic History and Theory.
B. W. SNOW, PH. D., Professor of Physics.
C. R. VAN HISE, PH. D., Professor of Geology.
C. A. VAN VEIZER, PH. D., Professor of Mathematics.

HENRY VAN LEEUWEN, Instructor in Milk Testing.
GRANT ROHN, Instructor at Butter-Worker.
JOSEPH H. GODFREY, Instructor at Separators.
LEWIS ENGLEMAN, Instructor at Separators.
U. S. BAER, Instructor in Cheese Making.
JULIUS BERG, Instructor in Cheese Making.
FRED ASHMAN, Instructor in Pasteurizing.
FRANK DEWHIRST, Instructor in Farm Dairying.
J. F. DIETRICH, Assistant Instructor in Farm Dairying.
FREDERICK CRANEFIELD, Instructor in Green House Practice.
J. H. STANTON, Instructor in Stock Judging.

OFFICERS OF THE EXPERIMENT STATION.

W. A. HENRY, Director.
S. M. BABCOCK, Chief Chemist.
F. H. KING, Agricultural Physicist.
E. S. GOFF, Horticulturist and Entomologist.
W. L. CARLYLE, Animal Husbandry.
F. W. WOLL, Chemist.
H. L. RUSSELL, Bacteriologist.
E. H. FARRINGTON, Dairy Husbandry.
J. A. JEFFERY, Assistant Physicist.
J. W. DECKER, Dairying.
ALFRED VIVIAN, Assistant Chemist.
FREDERICK CRANEFIELD, Assistant in Horticulture.
LESLIE H. ADAMS, Farm Superintendent.
MISS IDA HERFURTH, Clerk and Stenographer.
MISS E. M. CLOSE, Librarian and Stenographer.

STAFF OF THE FARMERS' INSTITUTES.

GEO. MCKERROW, Superintendent.
MISS HARRIET V. STOUT, Clerk and Stenographer.

Institute Conductors.

Corps No. 1—THOS. CONVEY, Ridgeway.
Corps No. 2—H. A. BRIGGS, Elkhorn.
Corps No. 3—ALEX. A. ARNOLD, Galesville.
Corps No. 4—GEO. C. HILL, Rosendale.
Corps No. 5—CHAS. THORP, Burnett.

Regular Assistants.

R. J. COE, Ft. Atkinson.
W. C. BRADLEY, Hudson.
L. E. SCOTT, Neenah.
F. H. MERRELL, Portage.
H. M. CULBERTSON, Medina.
C. P. GOODRICH, Ft. Atkinson (Dairy Expert).
ALEX. GALBRAITH, Janesville (Horse Expert).
C. E. MATTESON, Pewaukee (Poultry).
N. E. FRANCE, Platteville (Apiarist).
T. B. CLOSS, Cambria (Sheep Expert).
MISS M. L. CLARKE, Milwaukee (Cooking School Teacher).

Occasional Assistants, in Order of Work Performed.

KENNEDY SCOTT, Rio.
S. H. TODD, Wakeman, Ohio.
F. H. SCRIBNER, Rosendale.
H. C. TAYLOR, Orfordville.
W. F. STILES, Lake Mills.
CHAS. LINSE, La Crosse.
J. E. WING, Mechanicsburg, Ohio.
M. T. ALLEN, Waupaca.
F. C. EDWARDS, Ft. Atkinson.
GEO. J. KELLOGG, Janesville.
C. E. TOBEY, Phillips.
A. J. EDWARDS, Ft. Atkinson.
A. SELLE, Mequon.
W. J. GILLETT, Rosendale.
E. C. ALSMEYER, Arlington.
MRS. NELLIE S. KEDZIE, Peoria, Ill.
MRS. HELEN ARMSTRONG, Chicago, Ill.
DAVID IMRIE, Misha Mokwa.
E. L. ADERHOLD, Neenah.
PROF. W. A. HENRY, Madison.
PROF. E. S. GOFF, Madison.
J. W. DECKER, Madison.

GENERAL INFORMATION.

Three of the University buildings are wholly devoted to agricultural instruction and investigation. Agricultural Hall is a stone building, 120 feet in length by 42 feet in width, four stories in height. It contains two large lecture rooms, offices for the several instructors and investigators, library rooms, chemical and bacteriological laboratories.

Hiram Smith Hall is devoted entirely to dairying. This structure of brick and stone has a frontage of 95 feet by 48 feet in depth, and is three stories in height. It contains an office, lecture room, reading room, dairy laboratory, and rooms devoted to creamery practice, cheese making, farm dairying, pasteurizing, cheese curing, etc.

The Horticulture-Physics building, completed in 1896, has a frontage of 78 feet by 60 feet in depth, three stories in height; at the rear are glass houses covering a space of 88x75 feet. The right wing of the building with its greenhouses is devoted to plant life and horticulture. The left wing with its large glass house is devoted to instruction and investigation in the physics and mechanics of the farm.

At the Experiment Station Farm are the fields, barns and live-stock. Here, as elsewhere, all arrangements have in view investigation and instruction.

By its association with amply equipped laboratories of science and the practical arts, with departments in which are taught all the foreign languages that contain much reliable agricultural literature, with an active Experiment Station equipped with special laboratories and library, and with an Experimental Farm where practical tests are carried on, guided by experienced talent, the College of Agriculture affords exceptional opportunities to those who desire to become agricultural experts.

Besides these facilities the College of Agriculture has at its command, for the use of the students, the general laboratory facilities of the University, so far as they relate to general chemistry, physics, practical mechanics, biology, geology, etc. See pages 27, 29, and 183.

LIBRARIES.

The Agricultural Library contains 4,000 volumes relating to agriculture and several hundred pamphlets, all of which are available for the use of students. They have access also to the various other libraries of the University and the city. See page 26.

SOCIETIES.

Two societies are maintained, one by the students of the several agricultural courses, and one by those of the course in dairying. These organizations afford valuable opportunities for discussions of the many professional and practical questions concerning agriculture and dairying.

MEDALS.

Citizens of our state desiring to express their interest and appreciation of the Short Course instruction, have kindly offered the following medals to be awarded to second-year students for the 1898 term:

The Oglivie Gold Medal.—For the highest average in judging all classes of live stock; awarded by R. B. Oglivie, Madison, Wis.

The Hoven Gold Medal.—For the highest average in judging all classes of fat stock; awarded by M. J. Hoven, Madison, Wis.

The Hoven Silver Medal.—For the second highest average in judging all classes of fat stock.

The Briggs Silver Medal.—For the greatest proficiency in judging horses; awarded by H. A. Briggs, Elkhorn, Wis.

The Hoard's Dairyman Silver Medal.—For the greatest proficiency in judging dairy cows; given by Hoard's Dairyman, Fort Atkinson, Wis.

The Everett Silver Medal.—For the greatest proficiency in judging beef cattle; given by Chas. E. Everett, Beloit, Wis.

The McKerrow Silver Medal.—For the greatest proficiency in judging sheep; given by George McKerrow, Sussex, Wis.

The Jones Silver Medal.—For the greatest proficiency in judging swine; given by W. A. Jones, Mineral Point, Wis.

OTHER PRIZES.

Several additional prizes of various kinds have been announced for proficiency in various parts of the Short Course instruction.

FEES AND EXPENSES.**I. Graduate Course and Long Course.**

Tuition for residents of the State of Wisconsin, . . .	FREE
Tuition for non-resident students, per semester, . . .	\$9 00
Incidental fee, payable by all students, per semester, . . .	6 00

II. Short Course in Agriculture.

Tuition for residents of the State of Wisconsin, . . .	FREE
Tuition for non-resident students, per term, . . .	\$6 00
Incidental fee, for non-resident students, per term, . . .	10 00

III. Dairy Course.

Tuition for residents of the State of Wisconsin, . . .	FREE
Tuition for non-resident students, including lectureship fee, \$32 00	
Incidental fee, for resident students, for term, . . .	6 00

The expenses of students in the Graduate and Long Courses are practically the same as for those pursuing regular University courses.

Expenses of the student pursuing the Short Course in Agriculture will vary from \$50.00 to \$60.00 for the term for room, board, washing, and necessary books.

The expenses of the Dairy students will vary from \$50.00 to \$65.00 for the term.

PLAN OF AGRICULTURAL EDUCATION.

The system of education adopted by the College of Agriculture has three aims:

First, to develop agricultural science through investigation and experiment, and to disseminate the same through bulletins and reports;

Second, to give instruction in agriculture at the University;

Third, to disseminate agriculture knowledge among the farmers of the state by means of institutes and popular publications.

THE AGRICULTURAL EXPERIMENT STATION.

The purpose of the Experiment Station is the promotion of agricultural science by investigation and experimentation. In the choice of subjects it endeavors to select those which possess the greatest importance to the farmers of Wisconsin, so far as

the facilities at hand permit. At all times there is an earnest effort to give the investigations a careful fundamental character in order that the results may be real contributions to agricultural science. The Station is also a means of disseminating general and miscellaneous information on agricultural topics, and its staff cheerfully devotes the necessary time to private and public correspondence and to personal interviews.

The offices and laboratories of the station are in Agricultural Hall, on the University grounds. The Dairy Building lies midway between the general group of college buildings and the University farm. The Horticulture-Physics Building is located near the Dairy Building. The farm, with its buildings and the experimental grounds, adjoins the campus on the west.

By direction of the general government, which supplies a large portion of the funds for maintaining the Experimental Station, there are issued an annual report and frequent bulletins. Fifteen reports and seventy-three bulletins have been issued to date. Fifteen thousand copies of the report are printed annually, and the edition of the bulletins generally comprises twelve thousand copies. These bulletins and reports are free to all residents of the State upon application. The Station mailing list now embraces about nine thousand names of farmers and others to whom the reports and bulletins are regularly sent.

INSTRUCTION AT THE UNIVERSITY.

Systematic courses in agriculture have been arranged to meet the wants of students having different purposes in view.

The *Graduate Course* offers to advanced students opportunities for professional training and original investigation, made possible through a well-equipped and active Experiment Station, associated with numerous, amply furnished scientific laboratories. The special lines of study will be left largely to the selection of the students, subject to the approval of the Agricultural Faculty. It will be practicable to a large extent for such students to participate in experiments in progress and, after suitable experience, to conduct independent investigations. When contributions to knowledge of permanent value are made they will be published through bulletins of the Experiment Station under the name of the contributor.

The *Long Course* offers a liberal and scientific training along agricultural lines; it opens an avenue to a professional mastery

of agricultural chemistry, agricultural physics, horticulture, animal husbandry, dairying, and other special phases of the subject. Besides the strictly professional branches it embraces chemistry, physics, botany, zoology, geology, bacteriology, and similar branches which have an agricultural bearing. The field is so broad, however, that it is impossible for the students in four years to pursue all the courses offered, in addition to acquiring the necessary fundamental studies, and hence a large liberty of selection is allowed.

The *Short Course* is adapted to those who can devote only a limited time to study, and who wish to return at once to the active operations of the farm, and therefore desire the greatest amount of available and directly useful knowledge that can be acquired in the brief time allowed.

The *Dairy Course* is designed to meet the wants of those who intend to operate creameries and cheese factories.

TERMS OF ADMISSION.

Graduate Course in Agriculture. Graduates of this University and of other colleges and universities in good standing are admitted to this course without examination.

Long Course in Agriculture. The following branches are required: English grammar, including sentential analysis and orthography; arithmetic, algebra through quadratics, and plane and solid geometry; political and physical geography; history of the United States; physics; physiology and botany. Students from accredited schools will be admitted on the same basis as required for the General Science or English courses.

Short Course in Agriculture. Students in this course must be at least sixteen years of age, and have a good common school education. No entrance examinations are required, but those who come poorly prepared cannot expect the full benefits of the course.

Dairy Course. The terms of admission to this course will be the same as for the Short Course, excepting that the candidate must have had four months' experience in a creamery or cheese factory before entering the course.

Special Students in Agriculture. As many of the youth of the farming communities are not within reach of schools giving instruction in all the branches required for admission to the Long Course, limited concessions will be made to young men of exceptional strength and maturity by which they will be permitted to enter the University as special students in agriculture.

DEGREES.

The degree of Bachelor of Science in Agriculture is conferred on students who successfully complete the Long Course in Agriculture. The degree of Master of Science in Agriculture is conferred on Bachelors of Science in Agriculture who complete one year advanced study at the University and present an acceptable thesis on a topic approved by the Faculty.

LONG COURSE IN AGRICULTURE.**Freshman Year.**

Biology, full study for one year.

Mathematics, algebra and trigonometry, four-fifths study for the year.

German, four-fifths study for the year.

Rhetoric, two-fifths study for the year.

Military Drill and Gymnastics.

Sophomore Year.

Chemistry, full study for the year.

Physics, full study for the year.

German, four-fifths study for the year.

Rhetoric, two-fifths study for the year.

Military Drill and Gymnastics.

Junior and Senior Years.

Two years in Agricultural Chemistry, Agricultural Physics, Animal Husbandry, or Horticulture, as a major subject.

One year in one of the above-named subjects to be assigned by the professor in charge of the major subject.

One term in Veterinary Science.

Elective studies enough to make twenty-four semesters' work.

SHORT COURSE IN AGRICULTURE.

This course covers two terms of fourteen weeks each, beginning the first of December each year.

First Year.

Twenty-eight lectures on Feeds and Feeding by Prof. Henry.

Twenty-eight lectures on the Breeds of Live Stock, with score card practice additional in stock judging, by Prof. Carlyle.

Forty-nine lectures with 70 hours' laboratory practice in Agricultural Physics by Prof. F. H. King.

Forty-nine lectures on Plant Life with laboratory practice additional, by Prof. Goff.

Twenty-four lectures on Veterinary Science by Dr. Beattie.

Twelve lectures on Dairying by Dr. Babcock.

Seventy-two hours' practice in Farm Dairying and Dairy laboratory by Mr. Dewhurst.

A course in Farm Bookkeeping by Mr. Moore.

Second Year.

Twenty-eight lectures or equivalent in essay writing, on Animal Nutrition, by Prof. Henry.

Twenty-eight lectures on the Breeds of Live Stock, with seventy-two hours' practice in stock judging, by Prof. Carlyle.

Fifty-two lectures on Agricultural Physics and Meteorology, with 52 hours' laboratory practice, by Prof. F. H. King.

Twenty-eight lectures on Horticulture, with laboratory and greenhouse practice additional, by Prof. Goff.

Thirty-five lectures and recitations in Elementary Agricultural Chemistry, by Prof. Babcock.

Twenty-four lectures with demonstrations on Veterinary Science, by Dr. Beattie.

One hundred and twenty hours at work bench and forge by Prof. C. I. King.

Twelve lectures on Parliamentary Practice, by R. A. Moore.

Twelve lectures on Agricultural Economics, by Prof. Scott.

Twenty lectures in Bacteriology as applied to agricultural conditions, by Dr. Russell.

Students completing the studies of this course in a satisfactory manner are granted a Short Course Certificate.

An illustrated circular describing the Short Course in detail will be sent on application to R. A. Moore, Assistant to Dean, College of Agriculture, Madison, Wis.

COURSE IN DAIRYING.

The instruction in dairying is divided into four courses. The dairy class is divided into three sections, one of which is assigned daily to the laboratory, a second to the creamery, and a third to the cheese factory. The sections alternate so that each student receives instructions twice a week in each of the three departments. The courses are arranged as follows:

1. Lectures and Class-room Work.

Twenty-four lectures by Dr. Babcock on the constitution of milk, the conditions which affect creaming and churning, methods of milk testing, and preservation of milk, etc.

Sixteen lectures with demonstrations by Dr. Russell on the influence of bacteria in the dairy.

Eight lectures by Professor F. H. King on heating, ventilation, and other physical problems directly connected with dairy practice.

Ten lectures and demonstrations by Assistant Professor Richter on the care and management of the boiler and engine.

Ten lectures by Dr. Beattie on the common diseases of the dairy cow.

Eight lectures by Professor Henry on the feeding and management of dairy stock.

Eight lectures by Professor Carlyle on breeding and selection of dairy stock.

Twelve lectures by Professor Farrington on creamery management and accounts.

Twelve lectures on practical cheese making, by Mr. Decker.

2. Milk Testing. This embraces instruction in the laboratory by Professor Farrington and Mr. Van Sween is estimating the fat in milk, butter, and cheese by methods adapted to the factory and factory operators. Six hours per week.

3. Butter Making. Instruction in this course is given by Professor Farrington, with assistants. Butter making is carried on daily on the creamery plan. The student learns to operate the several forms of power centrifugal separators on the market. They attend to the ripening of the cream, churning and packing butter, carrying on all the operations as they would be conducted in a creamery. Twelve hours per week.

4. Cheese Making. In this course, Mr. Decker, with assistants, gives daily instruction in the manufacture of cheddar cheese, the operations being carried on as in the regular factory, the students being required to take careful notes and make reports of the process. Sixteen hours per week.

ADVANCED DAIRY WORK.

Being desirous of securing pupils who have had much experience in factory work before joining us, we offer the following inducements:

Such as can pass satisfactory examinations in the practical work of the creamery or cheese factory will be advanced early in the term to the experimental dairy section, where problems connected with this branch will be studied.

Advanced dairy instruction will consist of the following courses:

1. Instruction by Dr. Babcock on Milk and its Products.
2. Experimental investigations in Butter Making by Professor Farrington.
3. Investigations in Cheese Production by Mr. Decker.
4. Dairy Bacteriology by Dr. Russell. This work will include two lines:
 - a. A special course in the preservation of milk and cream for commercial purposes;
 - b. Students familiar with the use of the microscope will be admitted to the bacteriological laboratory for experimental work in dairy bacteriology.

EXAMINATIONS AND CERTIFICATES.

To secure a dairy certificate a student must have spent a full term in the Dairy School, and have two seasons' experience in a creamery or cheese factory, one of which must follow the period spent in the Dairy School. During the second season the candidate will report the operations of his factory monthly on blanks, and have his work inspected by an authorized agent of the University.

Additional information concerning the Dairy Course will be sent on application to Prof. E. H. Farrington, Madison, Wis.

This course opens the first of December each year and lasts twelve weeks.

DEPARTMENTS OF INSTRUCTION.

AGRICULTURAL CHEMISTRY.

PROFESSOR BABCOCK, ASSISTANT PROFESSOR WOLL, AND MR. VIVIAN.

1. The origin, composition, and classification of soils. The composition of air and the amount of plant food which it supplies. The elements necessary for plant development. The proximate composition of plants. The exhaustion of soils by different crops; the rotation of crops. The nitrogen problem. Classification of feeding stuffs; relative value of different systems of preserving forage crops. The silo and its losses. Manures, their classification, composition, sources, and relative value. Manurial value of fodders. Artificial fertilizers. Preservation and application of manures. The composition of the animal body. Animal nutrition. Digestibility of foods. *Lectures twice a week; first semester.* Professor BABCOCK.
2. The Chemistry of the Dairy; the composition and physical properties of milk and its manufactured products; the principles involved in modern dairy practice. Detection of adulteration, etc. *Lectures and laboratory practice; first semester; five times a week.* Professor BABCOCK.
3. Analysis of Fodders, Dairy Products, and Fertilizers. *Laboratory work during the year; three times a week.* Assistant Professor WOLL and Mr. VIVIAN.
4. Advanced and Original Work. Ash analysis. Chemical examination of soils. Estimation of sugars, starch, etc. Original investigations in the chemical laboratory. *Laboratory work during the year; five times a week.* Professor BABCOCK, Assistant Professor WOLL, and Mr. VIVIAN.

AGRICULTURAL PHYSICS.

PROFESSOR KING AND ASSISTANT PROFESSOR JEFFERY.

1. Meteorology. The aim of this course is, first, to cover the general principles of the subject and familiarize the student with meteorological methods and instruments, and second,

- to deal specially with the agricultural and horticultural phases of the subject. *Lectures and laboratory work; three times a week; first semester.*
2. Farm Engineering. Farm drainage and irrigation, the construction and maintenance of country roads, and the construction of farm buildings. *Twice a week; first semester.*
 3. Soil Physics. Physical characteristics, origin, and classification of soils; needs and methods of soil aeration; storage capacity of soils for water; movements of soil water as affected by texture, composition, fertilizers, and temperature; principles governing and the methods of determining soil temperatures; principles, methods and implements of tillage. *Full study; second semester.*
 4. Original investigations in the physical laboratory and field. *Full study; throughout the year.*

ANIMAL HUSBANDRY.

PROFESSOR HENRY AND PROFESSOR CARLYLE.

1. The Breeds of Live-Stock. Students taking this course are trained in judging live-stock by the use of typical animals, skeletons, charts, models, and score cards. As aids to the work, use will be made of the stock on the University Farm and on farms in the vicinity of Madison; also many photographic slides projected with the electric lantern. The agricultural library now embraces over 600 volumes of stud books, herd books, and flock registers. *Full study; first semester.* PROFESSOR CARLYLE.
2. Breeding. Principles of breeding (heredity, fecundity, etc.), methods of breeding (line-breeding, inter-breeding, cross-breeding, etc.), and the practice of breeding (horse, cattle, sheep, and swine breeding), taught by lectures, textbook work, and study of the practices of breeders as shown by the various stock registries. The text-books for this course are Darwin's *Animals and Plants under Domestication*, and Miles' *Stock Breeding*. *Full study; second semester.* PROFESSOR CARLYLE.
3. Feeds and Feeding. Chemical constituents of feeding materials, amount, combination, and form of these necessary to give the best results with the various kinds of live-stock. The student will familiarize himself with German feeding tables, the feeding trials conducted at our own

Station and the experimental work now in progress. Armsby's Manual of Cattle Feeding and Henry's Feeds and Feeding will be used as text-books. *Full study; first semester.* Professor HENRY.

4. Advanced work in Feeding and Breeding. Having completed the previous courses the student is in position to carry on investigations through a study of the work of the experiment stations of this country and the old world. Further, he will assist in conducting feeding trials at our own station. *Full study; one year.* Professor HENRY and Professor CARLYLE.

HORTICULTURE.

PROFESSOR GOFF.

1. General Principles of Horticulture. Propagation, planting, cultivating, pruning, and breeding of economic plants. Lectures, recitations and laboratory work. *Full study; first semester.*
2. Economic Horticulture. Special instructions in growing, harvesting, marketing, and preserving the principal fruits and vegetables of our climate, and on the leading injurious insects and diseases that prey upon these, and the best methods of preventing their ravages. Lectures, recitations, and laboratory work. *Three times a week; second semester.*
3. Aesthetic Horticulture. The principles of ornamental planting and of laying out gardens and pleasure-grounds, with the formation and management of lawns, and the adaptation of decorative plants. Lectures and recitations. *Twice a week; second semester.*
4. Special Investigation in subjects relating to the propagation and rearing of economic plants, including the suppression of injurious insects and diseases. Field and laboratory work. *Full study; throughout the year.*

THE ECONOMICS OF AGRICULTURE.

PROFESSOR SCOTT.

The object of this course is to furnish students of agriculture with an opportunity for acquaintance with the social aspects of their subject. The farmer is profoundly affected by general in-

dustrial conditions, and a knowledge of the forces which determine these conditions is essential to an intelligent prosecution of his business. This course will consist of one lecture each week during the short course term to second year students, and will embrace such topics as: The mutual relations of agriculture and other industries; value and prices with especial reference to land and agricultural products; money, its functions and varieties; banks and their functions; industrial and monetary crises and panics; systems of land tenure, etc. After each lecture an hour will be devoted to discussion, quiz, and questions asked by the students.

BACTERIOLOGY.

PROFESSOR RUSSELL AND MR. FROST.

The rapid development of bacteriology along agricultural lines necessitates a thorough understanding of the general principles of this science by those students that desire to keep abreast of the progress of the day. The University has now a fully quipped laboratory for the prosecution of class and research work along these lines.

1. General Bacteriology. This course considers the bacteria in their general biological aspect. Special emphasis is laid upon the relation of bacteria to their environment and the role which they play in nature. Various typical forms are studied with the microscope and in the different culture media.

This course is fundamental and should be regarded as the basis on which further specialization along agricultural or dairy lines can take place. Applicants must be thoroughly familiar with the compound microscope. *Lectures or equivalent; M., W., and F., at 11. First semester. Full study.* Professor RUSSELL and Mr. FROST.

2. Dairy Bacteriology. Students desiring to specialize in this line are given exceptional facilities in the way of experimental and practical work. The University herd and the practical work at the University Creamery give opportunity for the study of dairy problems under practical conditions, while such work can be closely controlled in the laboratory. The character of this work may be modified to meet the wants of the student. *Laboratory with conferences; full study; second semester.*

3. **Agricultural Bacteriology.** Opportunity for more general work in bacterial problems relating to general agriculture are given in this course. This work is varied to suit the needs of the student, but in general will consist of a study of the more important bacterial diseases of animals and plants; the general principles of fermentation and decomposition, and their special application to practical agriculture; study of soil bacteria, including nitrifying and legume organisms. *Laboratory work with conferences; full study; second semester.*

FARMERS' INSTITUTES.

The third division of work of the College of Agriculture is the instruction of farmers who are unable to come to the University for study. This is made possible through generous legislative provisions, by which a carefully supervised system of farmers' institutes is maintained. The institutes are in immediate charge of a Superintendent, who elaborates and controls the organization and execution of the institutes. He is aided by special conductors, who assist in perfecting the details and carrying the whole into effect. Members of the agricultural faculty render as much assistance as is consistent with their other duties. Experts in different departments are engaged to present special important themes. Lecturers are often brought from other states to treat on specific topics in which they are recognized authorities. Local talent is used to some extent and not the least of the educational benefits is the development of latent ability in writing, speaking and experimenting which has followed as a natural result of the interest awakened by this important stimulus.

During the institute season of 1898-9 institutes lasting two days each were held at the places named below:

Adams County.....	White Creek.
Barron County.....	Cameron, Dallas.
Brown County.....	Oneida, Wayside.
Buffalo County.....	Alma, Cream.
Burnett County.....	Trade Lake.
Calumet County.....	Brillion, Jericho.
Chippewa County.....	Cadott, Town of Cleaveland.
Clark County.....	Greenwood.
Columbia County.....	Kilbourn, Lodi, Poynette, Rio.
Crawford County.....	Bell Center, Wauzeka.

Dane County.....	Cottage Grove, London, Middleton, Mor- risonville.
Dodge County.....	Neosho.
Door County.....	Forestville.
Dunn County.....	Colfax, Menomonie.
Eau Claire.....	Augusta, Bracket, Fairchild.
Fond du Lac County..	Mt. Calvary, Oakfield.
Grant.....	Cuba City, Livingston, North Andover.
Green County.....	Brodhead, Monticello.
Green Lake County...	Kingston.
Iowa County.....	Arena, Avoca, Hollandale.
Jackson County.....	Hixton, Melrose, York.
Jefferson County.....	Ft. Atkinson.
Juneau County.....	Camp Douglas, Necedah.
Kenosha County.....	Silver Lake.
Kewaunee County.....	Casco.
La Crosse County....	West Salem.
La Fayette County....	Darlington, Woodford.
Lincoln County.....	Dudley Settlement, Tomahawk.
Manitowoc County....	Kelnersville, St. Wendel, Tisch Mills.
Marathon County.....	Unity.
Marinette County.....	Peshigo.
Marquette County....	Briggsville.
Monroe County.....	Cashton, Tomah, Sparta (Closing Inst'te.)
Oconto County.....	Abrams, Lena, Town of Little River.
Outagamie County....	Black Creek, Hortonville.
Ozaukee County.....	Grafton.
Pepin County.....	Durand.
Pierce County.....	Ellsworth, Rock Elm.
Polk County.....	Amery, Cushing, West Denmark.
Portage County.....	Junction City, Plover.
Price County.....	Prentice, Town of Breman.
Racine County.....	Union Grove, Waterford.
Richland County.....	Hub City, Sextonville.
Rock County.....	Evensville, Footville.
St. Croix County.....	Baldwin, Somerset.
Sauk County.....	North Freedom, Sauk City.
Shawano County.....	Bonduel, Mattoon, Tigerton.
Sheboygan County....	Beechwood, Rhine.
Trempealeau County...	Arcadia, Osseo.
Vernon County.....	La Farge.
Walworth County.....	Lake Geneva, Whitewater.

Washington County...Allenton, South Germantown.
 Waukesha County....Dousman, Eagle, Merton, Muskego.
 Waupaca County.....Iola, Manawa, Waupaca.
 Waushara County....Hancock, Wild Rose.
 Winnebago County...Town of Algoma, Koro, Neenah.
 Wood County.....Grand Rapids.

In addition to the regular institute work cooking schools of two lectures each were held in connection with the institutes, at the following points:

Lake Geneva	Evansville	West Salem
Union Grove	Sauk City	Kilbourn City
Whitewater	Lodi	Brodhead
Darlington	Ft. Atkinson	Sparta

Institutes are placed for the most part in localities which show the greatest interest in this movement. Applications for institutes will be received by the superintendent and presented to the agricultural committee by Sept. 30th. The committee goes over the list and carefully considers the needs and interests of each locality, and places the institutes where, in its judgment, they will prove the most helpful. Generally there have been far more applications for institutes than it was possible to supply. Applications should be received before Sept. 15, each year.

The Farmers' Institute Bulletin.

To disseminate still more widely a representative portion of the matter presented and discussed at the institutes, and to give it permanency for its own sake and for its historical value, a system of publications in the form of bulletins has been begun by the superintendent. Bulletin No. 12, the last issued, contains a stenographic report of the closing institute held at Janesville in March, 1898. Sixty thousand copies of this Bulletin have been issued. Eight thousand cloth-bound copies have been placed in the school district libraries of the state, thirty-five thousand have been given to the farmers in attendance at the institutes, and the remainder distributed through cheese factories, creameries, etc. Copies will be sent to all applicants living within the state upon receipt of 10 cts., to pay postage and mailing, for paper covers, and 25 cts. for cloth bound covers. To those outside of Wisconsin 25 cts. for paper covers and 40 cts. for cloth bound copies will be charged, to cover mailing and cost of publication.

COLLEGE OF LAW.

STAFF OF INSTRUCTION.

- C. K. ADAMS, LL. D., President.
- E. E. BRYANT, Dean of the Law Faculty, Professor of Elementary Law, Practice and Pleading, Equity, Railway Law, and the Law of Public Offices and Officers.
- C. N. GREGORY, A. M., LL. B., Associate Dean of the Law Faculty,, and Professor of Criminal Law, the Law of Contracts, of Sales, and of Probate.
- J. B. CASSODAY, LL. D., Chief Justice of the Supreme Court of Wisconsin, Professor of Constitutional Law.
- J. H. CARPENTER, LL. D., Jackson Professor of Partnership.
- B. W. JONES A. M., LL. B., Professor of the Law of Evidence. Public Corporations, and Domestic Relations.
- J. M. OLIN, A. M., LL. B., Professor of the Law of Real Property, Wills and Torts.
- R. M. BASHFORD, A. M., LL. B., Professor of the Law of Private Corporations, and Commercial Law.
- A. A. BRUCE, A. B., LL. B., Assistant Professor of the Law of Agency, Carriers and Public Health and Safety.
- J. B. PARKINSON, A. M., Professor of Constitutional Law and International Law.
- R. T. ELY, PH. D., LL. D., Professor of Political Economy.
- F. J. TURNER, PH. D., Professor of American History.
- C. H. HASKINS, PH. D., Professor of Institutional History.
- W. A. SCOTT, PH. D., Professor of Economic History and Theory.
- D. B. FRANKENBURGER, A. M., Professor of Rhetoric and Oratory.

Special Lecturer.

HON. WM. F. VILAS, LL. D., Special Lecturer on Jurisdiction.

GENERAL STATEMENT.

The superior advantages of professional schools, for the training of students in the elementary principles of law and fitting them to enter upon the practice, are now quite generally acknowledged by the members of the bar.

Among the more important of the advantages afforded to the student by the Law School over the law office or private or solitary pursuit of the study, the following are the most obvious:

1. He is taught to trace the growth, progress, and expansion of our body of law.

2. His studies are directed to give him a comprehensive, general view and analysis of the law as a system. By the inductive or case method he is taught to seek the law in its original sources and deduce principles from decided causes.

3. He is well instructed in elementary principles.

4. While studying the substantive law, he is at the same time familiarized with the principles of procedure and general rules of practice, their necessity and application.

5. Having access to large, well-selected libraries, he becomes familiar with the literature of the law, and learns where to readily find the law of any subject in the decisions and elaborate treatises.

6. Constantly examined, orally and in writing, upon his reading, he becomes more proficient in the expression of his thoughts and knowledge.

7. By constant association, study, discussion, and friendly controversy, with fellow students, he acquires self-reliance, overcomes timidity, and learns the value of thorough preparation. His mental faculties are quickened and his resources are brought under his command.

8. In the preparation and argument of cases in the moot court, under proper guidance, he has an experience of great utility in fitting him for the actual controversies of professional life.

The published statement of a member of the New York Board of Examiners for admission to the Bar shows that nearly twice as large a percentage of applicants educated in law offices fail to pass the bar examination as of applicants educated in Law Schools.

The Law Schools of the United States, as appears by the report of the American Bar Association for 1897, instructed 10,048 students during the past year and they have won the earnest commendation of the best English teachers and writers as: Rt. Hon. James Bryce, Q. C., M. P.; Mr. Dicey, Q. C., Vinerian Professor at Oxford, and Sir Frederick Pollock, Corpus Christi Professor of Jurisprudence at Oxford, as superior to the English Schools of Law.

The College of Law of the University of Wisconsin offers a course which is believed to be of practical merit, and to give as much valuable and practical instruction and training as can be given in a three years' course of study. The elementary instruction in substantive law usual in all law schools is here fully and carefully given. Less instruction is imparted by means of the lecture alone than in many schools; the "Case System" is in part used, and much original work carefully directed is required of the students; and examinations are rigid and conducted at frequent intervals.

The design of this College is to prepare students for practice in the several states of the Union, and to this end endeavor is made to give thorough instruction in the principles of law, including:

First. THE COMMON LAW, its history, development, and present state in the United States, with the statutory modifications generally adopted in the several states.

Second. EQUITY, its history, development, and present state in the United States.

Third. THE LAW OF PROCEDURE, including the practice and pleading in Common-law Courts, Courts of Equity, and under the Codes of Civil Procedure.

Fourth. THE PUBLIC LAW of the United States and Constitutional Law.

International Law, Roman Law, and Comparative Constitutional Law are taught in the University in classes open to students of the College of Law.

Admission.

Students applying for admission to the College of Law may be admitted, as are students in other departments, by either of two methods:

1. On certificates from accredited schools or colleges.
2. On examination at the University.

The requirement for admission certificates is the same as for admission to the other departments under title "Admission." The examination required is the regular examination upon the studies of group 1 for admission to the freshman class and is conducted at the same time and by the same members of the Faculty as the examination of candidates for admission to the College of Letters and Science.

These examinations for the freshman class will be held June 15 and 16, and September 26 and 27, A. D. 1899.

The examination will cover the following topics:

GROUP I. *Subjects required of all candidates:*

- a. GEOGRAPHY, political and physical.
- b. HISTORY OF THE UNITED STATES: Thomas or Johnston's History of the United States, or an equivalent.
- c. ARITHMETIC.
- d. ALGEBRA: Addition, subtraction, multiplication, division, equations of the first degree with one unknown number, simultaneous equations of the first degree, factors, highest common factor, lowest common multiple, quadratic equations, simultaneous equations above the first degree, theory of indices (positive, negative, fractional, and zero), and radicals.

GEOMETRY: Plane and solid geometry. In solid geometry special attention should be given to the geometry of the sphere.

- e. ENGLISH IN GENERAL: No pupil will be accepted in English whose written work is notably deficient in point of *spelling, punctuation, idiom, or division into paragraphs.*
- f. ENGLISH COMPOSITION: 1. The candidate will be required to write two essays of not less than two hundred words each, on subjects chosen by himself from a considerable number—perhaps ten or fifteen—set before him in the examination paper, and one of the topics chosen must be taken from the books assigned for general reading under English Literature.
2. In place of the essay on the topic drawn from the books set for general reading, the candidate will be allowed to offer an exercise book containing the first draft of essays written during his preparatory course, on topics taken from the works prescribed for general reading. These essays must be written under the eye of the teacher without consulting the books from which the subjects are taken, and without other assistance, must be kept in the care of the teacher, and sent by him to the examiner at least one week before the date of the entrance examination, with his certificate that they have been written in accordance with these requirements.

- g. **ENGLISH LITERATURE.** The following lists include (1) a series of books for general reading, which may also be used as a basis for work in English Composition; (2) a limited number of masterpieces for thorough study. In addition to the essays called for under the head of *English Composition*, there will be required such further tests as seem suited to secure a careful reading of all the books prescribed in series (1). The written statement of the teacher will be sufficient, in general, for this purpose. In the case of the books set for more thorough study, the candidate will be examined on subject-matter, form and substance, and the examination will be of such a character as to require a thorough study of each of the works named, in order to pass it successfully.

I. For General Reading and Composition work:

1899—Pope's Translation of the Iliad (Books I., VI., XXII., and XXIV.). The Sir Roger de Coverley Papers, Goldsmith's Vicar of Wakefield, De Quincey's Flight of a Tartar Tribe, Cooper's Last of the Mohicans, Lowell's Vision of Sir Launfal, Hawthorne's House of the Seven Gables.

1900—Pope's Translation of the Iliad (Books I., VI., XXII., and XXIV.). The Sir Roger de Coverley Papers, Goldsmith's Vicar of Wakefield, Scott's Ivanhoe, De Quincey's Flight of a Tartar Tribe, Cooper's Last of the Mohicans, Tennyson's Princess, Lowell's Vision of Sir Launfal.

1901—George Eliot's Silas Marner, Pope's Translation of the Iliad (Books I., VI., XXII., and XXIV.). The Sir Roger de Coverley Papers, Goldsmith's Vicar of Wakefield, Scott's Ivanhoe, Shakespeare's Merchant of Venice, Cooper's Last of the Mohicans, Tennyson's Princess, Coleridge's Rime of the Ancient Mariner.

1902—The same as for 1901.

2. For thorough study.

1899—Shakespeare's Macbeth, Milton's Paradise Lost (Books I. and II.), Carlyle's Essay on Burns, Burke on Conciliation with America.

1900—Shakespeare's Macbeth, Milton's Paradise Lost (Books I. and II.), Burke on Conciliation with America, Macaulay's Essays on Milton and Addison.

1901—Shakespeare's Macbeth, Milton's L'Allegro, Il Penseroso, Comus, and Lycidas, Burke on Conciliation with America, Macaulay's Essays on Milton and Addison.

1902—Shakespeare's Macbeth, Milton's L'Allegro, Il Penseroso, Comus, and Lycidas, Burke on Conciliation with America, Macaulay's Essays on Milton and Addison.

ENGLISH GRAMMAR. There is included in this requirement for entrance a knowledge of the leading facts of English grammar, and tests of such knowledge will be made a part of the examination.

Those intending to apply for admission should notify the associate Dean before the commencement of the year, and apply for directions, as examinations cannot be had after the commencement of the year. No student of the junior class will be admitted to the middle class who fails to pass an examination in the principal studies of the junior year, except conditionally; and the work of the middle year must be completed before the student is entitled to full rank as a senior.

ADMISSION OF GRADUATES.

Candidates will be admitted without examination upon presenting certificates of graduation from any reputable college or university, State normal school, accredited high school or academy, or upon presenting a first-grade teacher's certificate issued in this state.

ADMISSION TO ADVANCED STANDING.

Candidates eligible for entrance, who have studied elsewhere, and can pass examinations upon the studies of the junior year or middle year, or their equivalent, can enter the middle or senior year, but such examination will be most searching and thorough, embracing all the studies of the junior and middle years. The examinations will be chiefly in writing, extending over all the topics of the first two years, except as above indicated, and occupying five days.

Students applying for admission to the middle or senior class, upon examination, must report in person for the examination, which begins on the Tuesday of the week preceding the commencement of the academic year, as the examination will occupy some five days; *and no such examinations can be held after the appointed time.* Such examinations begin September 19, 1899.

Candidates presenting duly accredited certificates from other law schools of good standing will be admitted to corresponding standing in this College, without passing examinations.

Students entering any class after the beginning of the academic year will be required to read and pass examinations in the work of the class which has been done prior to their admission. All who desire to enter the classes should begin at the opening of the year, as the disadvantage of entering a class some weeks after it is organized is one that hampers the late-coming student through his whole course.

Students who have graduated from the University of Wisconsin, and who have elected and taken six hours of the junior year's work in the College of Law, and passed examinations thereon, will be permitted to graduate upon taking a two years' course in the College of Law.

Admission of Special Students Twenty-three Years of Age and Upwards.

At a meeting of the Board of Regents held in June, 1897, a resolution was adopted by which persons twenty-three years of age will hereafter be permitted to take *special studies* in the College of Law upon giving satisfactory evidence that they are prepared to take the desired studies advantageously. If they subsequently desire to become candidates for a degree or to take a regular course, they must pass the required entrance examinations.

Under this rule students of the required age can be received without passing the entrance examination, and can prepare themselves to take and pass the entrance examinations during their law course.

The passing of the entrance examination, however, is a condition precedent to their taking a degree.

Elective Studies.

The following regulations have been authorized respecting elective studies:

1. Students of the College of Letters and Science will be permitted to elect, as part of their undergraduate course, junior studies in the College of Law to an amount not exceeding altogether six (6) hours per week for one year. The studies to be so elected are to be designated by the College of Law, and the studies for which they may be substituted, by the College of Letters and Science.

2. Students of the junior class of the College of Law may

elect studies in the College of Letters and Science, and substitute them for studies in the junior year of the law course, to an amount not exceeding four hours per week for that year. The studies to be elected are to be designated by the College of Letters and Science, and those for which they may be substituted by the College of Law.

3. Graduates of the College of Letters and Science who have elected six hours of study per week for one year in the College of Law are to be admitted on graduation to the middle class of the College of Law.

4. The fees for such elective studies are prescribed by the Board of Regents at \$25 per annum.

METHODS AND COURSE OF INSTRUCTION.

The methods of instruction and course of study in this College, subject to necessary modifications, are substantially as follows:

Junior Year.

First semester. Elementary Law. *Two hours a week, 16 weeks.* Text-book: Bryant's Outlines of Law. Dean BRYANT.

Contracts. *Two hours a week.* Text-book: Keener's Cases on Contracts. Associate Dean GREGORY.

Domestic Relations. Text-book: Schouler on Domestic Relations. *One hour a week.* Professor JONES.

Commercial Paper. *One hour a week.* Text-book: Tiedeman on Commercial Paper. Professor BASHFORD.

The Law of Real Property. *One hour a week.* Text-book: Tiedeman on Real Property; to topic, "Trusts," in first year. Professor OLIN.

Courts and Jurisdiction. Notes, lectures, and statutes. *One hour a week for ten weeks.* Dean BRYANT and Mr. VILAS.

Common-law Actions and Pleading. Text-book: Andrews and Stephens on Pleading. *One hour a week, twelve weeks.* Dean BRYANT.

Agency. Text-book: Huffcut's Cases on Agency. *Two hours a week.* Assistant Professor BRUCE.

The Faculty Moot Courts meet several times weekly. These Courts give each student opportunity to prepare and argue a case on a submitted statement of facts as often as once each semester.

Written examinations at the close of topics or end of semester are required throughout the course.

Second semester. Text-book: Bryant's Notes on Taxation. *One hour a week, eight weeks.* Professor JONES.

Contracts. *Two hours a week.* Text-book: Keener's Cases on Contracts. Associate Dean GREGORY.

The Law of Public Offices and Officers. Text-book: Mechem on Public Offices and Officers. *One hour a week, eighteen weeks.* Dean BRYANT.

Real Property. The study is pursued as indicated in the work for the first semester. *One hour a week.* Professor OLIN.

Municipal Corporations. Text-book: Elliott's Elements of Municipal Corporations. *One hour a week, nine weeks.* Professor JONES.

Common-Law Pleading, continued. *Two hours a week, twelve weeks.* Dean BRYANT.

Common-Law Practice. *One hour a week, eight weeks.* Dean BRYANT.

Commercial Paper, continued. *One hour a week.* Professor BASHFORD.

Agency. Text-book: Huffcut's Cases on Agency. *Two hours a week.* Assistant Professor BRUCE.

Middle Year.

First semester. Real property. Text-book: Tiedeman on Real Property, commencing with the subject of Trusts, and ending with the subject of Title by Devise. *One hour each week throughout the year.* Professor OLIN.

Private Corporations. Text-book: Clark on Corporations. *One hour a week.* Professor BASHFORD.

Equity Jurisprudence, continued. Text-book: Bryant's Outlines Equity Jurisprudence. *Two hours a week, twelve weeks.* Dean BRYANT.

Equity Pleading and Practice. Text-book: Shipman on Equity Pleading. *One hour a week, fourteen weeks.* Dean BRYANT.

Code Pleading. Text-book: Bryant on Code Pleading. *Two hours a week, twelve weeks.* Dean BRYANT.

Law of Sales. Text: Williston's Select Cases on Sales. *Two hours a week.* Associate Dean GREGORY.

Partnership. *One hour a week.* Professor CARPENTER.

Municipal Corporations. Text-book: Elliott's Elements of Municipal Corporations. *One hour a week, twelve weeks.* Professor JONES.

Evidence. Text-book: Jones on Evidence. *One hour a week for six weeks.* Professor JONES.

Damages. Text: Beales Cases on Damages. *Two hours a week, ten weeks.* Assistant Professor BRUCE.

Carriers. Text: McClain's Cases on Carriers. *Two hours a week, four weeks.* Assistant Professor BRUCE.

Second semester. Real Property. Text-book: Tiedeman on Real Property. The subjects of Title by Public Grant and Mining Law comes in this semester. *One hour a week.* Professor OLIN.

Equity Jurisprudence, continued. Text-book: Bryant's Outlines of Equity Jurisprudence. *One hour a week, fourteen weeks.* Dean BRYANT.

Code Pleading. *Two hours a week, eight weeks.* Dean BRYANT.

Criminal Law and Procedure. *Two hours a week.* Text: Clark on Criminal Law and Clark's Criminal Procedure and Select Cases. Associate Dean GREGORY.

Private Corporations, continued. *One hour a week.* Professor BASHFORD.

Equity Practice in Federal Courts. Text: Federal Court Rules. Dean BRYANT.

Eminent Domain. *One hour a week, ten weeks.* Dean BRYANT.

Evidence. *One hour a week.* Text: Jones on Evidence. Professor JONES.

Carriers. Text: McClain's Cases on Carriers. *Two hours a week.* Assistant Professor BRUCE.

Senior Year.

First semester. Constitutional Law. Lectures and study of leading cases. *One hour a week.* Chief Justice CASSODAY.

Pleading and Practice in Extraordinary Remedies. *One hour a week, six weeks.* Dean BRYANT.

Code Practice. *One hour a week, fifteen weeks.* Dean BRYANT.

The Law of Evidence. Text-book: Jones on Evidence. *One hour a week.* Professor JONES.

The Practice in Creditor's Suits and Supplementary Proceedings. *One hour a week, six weeks.* (Text: Bryant's Code Practice.) Dean BRYANT.

Practice on Writs of Error and Appeals. *One hour a week, eight weeks.* (Text: Bryant's Code Practice.) Dean BRYANT.

The Practice in Inferior Courts. *One hour a week, twelve weeks.* Text: Bryant's Justice. Dean BRYANT.

Banking, Insurance, Voluntary Assignments. Text: Elliott on Insurance. *One hour a week.* Professor BASHFORD and Dean BRYANT.

Probate Law. *Two hours a week.* Lectures, notes, and select cases. Associate Dean GREGORY.

The Law of Wills. *Fourteen weeks, one hour each week.* Text: Cassoday on Wills. Professor OLIN.

The Law of Torts. Bigelow on Torts as a text-book. *One hour each week for three weeks.* Professor OLIN.

Actions for Foreclosure and Procedure. *One hour a week, six weeks and assigned work.* Lecture and practical instruction. Dean BRYANT.

International Law. *One hour a week for ten weeks.* Notes and lectures. Dean BRYANT.

Trusts, and Procedure relating thereto. *One hour a week for ten weeks.* Text: Underhill on Trusts. Dean BRYANT.

Public Health and Safety. Text: Parker & Worthington on Public Health and Safety. *One hour a week.* Assistant Professor BRUCE.

Second semester. Constitutional Law, continued. Lectures and leading cases. *One hour a week.* Chief Justice CASSODAY.

The Law of Evidence. Text: Jones on Evidence. *One hour a week.* Professor JONES.

Banking, Insurance, and Voluntary Assignments. Lectures and cases. *One hour a week.* Professor BASHFORD.

Select Cases in Equity Procedure. *One hour a week, ten weeks.* Dean BRYANT.

Legal History. Lectures and special studies. *One hour a week, ten weeks.*

Pleading and Practice in Equity. *Two hours a week, seven weeks.*

Forensic Oratory. Text-book: Robinson's Forensic Oratory, selections, and lectures. *One hour a week, ten weeks.* Dean BRYANT.

Select Wisconsin Cases in Law of Contracts and Personal Property. *Two hours a week.* Associate Dean GREGORY.

The Law of Torts. Continued as in the first semester. *One hour each week.* Professor OLIN.

Procedure. Methods in different systems contrasted. *One hour a week, eight weeks.* Dean BRYANT.

The Trial of Actions. *One hour a week for seventeen weeks.* Dean BRYANT.

Legal Ethics. Lectures. *One hour a week, four weeks.* Dean BRYANT.

Public Health and Safety, continued as in the first semester. *One hour a week.* Assistant Professor BRUCE.

RESOURCES OF THE COLLEGE OF LAW.

The Board of Regents annually make such an appropriation as is needed for the support of this College. The matriculation fees charged for its course constitute only a part of the resources by which it is maintained.

By the will of the late Judge Mortimer M. Jackson, funds to the amount of twenty thousand dollars were bequeathed to the University to found and maintain a Professorship of Law. In accordance with the wishes of the donor, Judge J. H. Carpenter, an instructor of long experience and well-recognized ability, has been elected to this professorship. The act of 1891, by which the legislature provided for the erection of the building for the College, provided also for its equipment; and as fast as this appropriation can be realized the library will be enlarged, and the appointments of the College kept up to maintain it in the greatest utility. One thousand dollars per year is appropriated by the legislature to the support of its library.

SPECIAL ADVANTAGES.

The advantages which the City of Madison affords to the law student, it is believed, are equal, and in many respects superior, to those to be found in any place where a law school is established in this country. Among them are the following:

Courts.

The Supreme Court of the state is in session during the most of the academic year; and students have opportunity to listen to carefully prepared arguments by the ablest lawyers of the country.

Two terms of the United States Circuit and District Courts are held here annually, and important cases are here tried, both on the law side of the court before juries and in equity causes, illustrating the procedure in the Federal Courts.

The Circuit Court for Dane County holds three terms each year, giving the student opportunity to observe the methods and

practice under the code system, which is substantially like that in twenty-seven states and territories.

The Municipal Court of Dane County sits daily for the trial of criminal cases.

Facilities conveniently at hand for becoming familiar with the practice in courts and the methods pursued by able and successful practitioners are thus afforded.

The statutes of the state provide that "any resident graduate of the Law department of the University of Wisconsin shall be admitted to the bar of any court, upon the production of his diploma, and may be admitted to the Supreme Court when not in session by an order signed by one of the justices thereof and filed with the clerk" (R. S. Wis. Sec. 2586.) Under this statute and a rule of the Federal court, it is customary for the graduating class, on motion of a member of the faculty, to be admitted to both courts immediately upon graduation.

The Legislature

of the state holds one or two sessions during each course, enabling students to observe the processes of legislation.

The University.

The University of Wisconsin has a corps of instructors selected from the best scholars in their respective specialties. On obtaining a proper certificate from the Associate Dean, students of the College of Law may pursue studies for which they are prepared in any other department without extra charge, in so far as the work of the College of Law leaves them time. Many students of law avail themselves of the privilege. The site of the University buildings is one of the most beautiful in the United States. Large sums have been and are being expended in building, libraries, and apparatus in all the departments. The attendance of students from the best youth of the country is large and steadily increasing. The student of the College of Law is surrounded by the best influences. He is not only in a "legal atmosphere," but his associations are with those who, in other lines of study, are striving for excellence.

Law College Building.

The liberality of the state has provided the means, and the Regents have erected a building, for the College of Law, which

is one of the most commodious in the country. It is located on the campus or University ground, convenient of access, and on a commanding site, built of the brown sand-stone of Lake Superior, at a cost of over \$86,000, and is especially designed to be convenient for the uses of the College. Its lecture rooms and library are large, capable of comfortably seating several hundred students. The most approved systems of lighting, heating, and ventilation, and the most convenient appliances for writing or taking notes, are furnished. Rooms for moot courts and class debates are, also, provided.

The School of Economics, Political Science, and History,

under the direction of Dr. Richard T. Ely, with an able corps of instructors and special lecturers, is established in other rooms of the same building. Students of the College of Law are enabled to pursue the studies of this school and attend lectures upon political economy, institutional history, constitutional and international law, civil polity and American history, and special lectures on such topics as the distribution of wealth, socialism, taxation, government of cities, pauperism, criminology, public finance, economics of agriculture, and various other topics ably treated by advanced teachers and thinkers on these and similar topics. These subjects are of especial importance and value to the student of American law, and add greatly to the advantages of the College of Law, giving its students especially convenient facilities for including the economic studies in their course. To a limited extent the law students are permitted to elect studies in this School during the first year.

Libraries.

The College of Law has an excellent and rapidly increasing library of the best law books and reports. This is enlarged by an annual appropriation made by the Legislature for that purpose. It is open for the use of law students during the day and evening.

The law library of the state, the largest and most complete in the Northwest, is located in the Capitol building; and students of the College of Law have heretofore been permitted, under reasonable restrictions, to use its books for reference, and conveniences are afforded them for the use of the books in preparing briefs or pursuing topical investigations. Under proper regulations it is hoped this will be continued.

The Library of the State Historical Society, with about 103,000 volumes and 100,000 pamphlets, a collection of books of the greatest value in historical study and research, is open to all students of the University.

The General University Library, including the department libraries catalogued with it, contains about 50,000 volumes and 14,000 pamphlets, and is open every week-day and evening to students. About three hundred of the best American and foreign periodicals are taken and kept on the files for students' use.

The Bar.

The bar of Dane County is an unusually strong one, especially noted for the thoroughness of its members in preparing their cases for trial, and for their accurate and precise methods in practice. Students, who desire it, can generally obtain situations in law offices, where they have opportunities to assist in practice, in the preparation of briefs and in the conduct of legal business, at the same time attending lectures and the practical exercises of the class; and in some instances they thus have opportunity of earning something towards their support.

EXAMINATION FOR GRADUATION.

For graduation each student will be required to have passed a satisfactory examination upon all studies pursued during the three years of the course; such examinations to be made either at the end of each semester, or on completion of a particular topic; and he must have prosecuted or defended to judgment such moot court cases as shall have been assigned by the Faculty, and must also have prepared such legal papers, pleadings, etc., as have been assigned for practice; and at least one month before the close of the senior academic year, and at such time as the Dean shall appoint, must have prepared and submitted to the Faculty, a satisfactory thesis upon some legal topic, to be examined, criticised, and marked by some member of the Faculty.

As the real ground-work of legal proficiency is laid in the beginning of the course, all should strive to take the full course rather than trust to such progress as can be made in a law office or reading in private. If but one year can be spent at a law school, the first year will be the most valuable. The student can, upon the proficiency thus gained, more easily be admitted to the profession on examinations by the State Board of Examination

for admission to the bar, and, in his future studies have the benefit of elementary training.

Students, who are able to do so, should furnish their own text-books, and books of selections of cases. They will need them in practice after graduation, and can hardly afford to be without them during their course. Arrangements have been made by which they can be ordered through the Secretary of the Board of Regents, and obtained at a considerable discount from quoted prices. It is believed that the books required for the first year can be obtained for about sixty dollars; for the second and third years, for about one hundred dollars. The law library has several copies of some of the text-books most used, for the use of students who are unable to buy their own; but it is impracticable for the public libraries to provide text-books sufficient for the use of all the students.

SOCIETIES.

The Forum, and the Columbian are incorporated literary societies, composed entirely of law students. Each of them holds weekly meetings in one of the rooms of the college for debates and other literary exercises. Opportunity is afforded to each student frequently to take part in debate.

FEES.

The matriculation fee for the full course is \$150, of which \$75 must be paid at the opening of the first year, \$50 at the opening of the second year, and \$25 at the opening of the third year. No deductions are made for absences nor for failure to begin at the opening of a year, nor is extension of time allowed for payment of fees. Fees must in all cases be paid in advance.

Expenses.

The matriculation fees in the College of Law are as follows:
For the full course of three years or its equivalent.....\$150.00

The fees are apportioned thus for students graduating in three years:

First year	\$75.00
Second year	50.00
Third year	25.00

For students graduating in two years:

First year	\$75.00
Second year	50.00

For students admitted to the senior class and graduating in one year\$100.00

Students of the College of Letters and Science taking the elective studies in the junior class will pay for the first year 25.00

And such students will pay for the middle year..... 75.00

For the senior year..... 50.00

All fees are payable in advance at the office of the Secretary of the Board of Regents, College of Law. Admission to membership in the classes is not permitted until the fees are paid.

The expenses of living are moderate. Good board can be obtained at from \$2.50 to \$4 per week, and by forming or joining clubs the expenses can considerably be reduced. Students desiring information in regard to boarding places, or general information as to expenses, should address their inquiries to the Secretary of the Board of Regents, Madison, Wisconsin.

A careful perusal of this general statement it is believed will supply all needed information; but should further inquiries as to admission, examination, etc., be necessary, they should be addressed to the Associate Dean of the Law Faculty, Madison, Wisconsin.

SCHOOL OF PHARMACY.

STAFF OF INSTRUCTION.

- C. K. ADAMS, LL. D., President of the University.
- E. KREMERS, Ph. G., Ph. D., Director, and Professor of Pharmaceutical Chemistry.
- E. A. BIRGE, Ph. D., Sc. D., Professor of Zoölogy.
- L. S. CHENEY, M. S., Assistant Professor of Pharmaceutical Botany.
- W. W. DANIELLS, Sc. D., M. S., Professor of Chemistry.
- J. C. ELSOM, M. D., Professor of Physical Culture and Director of the Gymnasium.
- D. B. FRANKENBURGER, A. M., LL. B., Professor of Rhetoric and Oratory.
- C. N. GREGORY, A. M., LL. B., Professor of Law.
- R. L. HARPER, Ph. D., Professor of Botany.
- L. R. HEAD, A. B., M. D., Special Lecturer on "First Aid to the Injured."
- H. W. HILLYER, Ph. D., Assistant Professor of Organic Chemistry.
- W. H. HOBBS, Ph. D., Assistant Professor of Mineralogy and Petrology.
- L. KAHLERENG, Ph. D., Assistant Professor of Physical Chemistry.
- E. T. OWEN, A. B., Professor of French Language and Literature.
- W. H. ROSENSTENGEL, A. M., Professor of German Language and Literature.
- H. L. RUSSELL, Ph. D., Professor of Bacteriology.
- W. M. SMITH, A. B., Librarian.
- B. W. SNOW, Ph. D., Professor of Physics.
- R. H. TRUE, Ph. D., Assistant Professor of Pharmacognosy.
- C. R. VAN HISE, Ph. D., Professor of Geology.
- C. A. VAN VELZER, Ph. D., Professor of Mathematics.
- F. W. WOLL, M. S., Assistant Professor of Agricultural Chemistry.
- V. H. BASSETT, A. B., Fred Vogel, Jr., Fellow in Pharmaceutical Chemistry.
- A. N. COOK, M. A., Assistant in Chemistry.

W. S. FERRIS, B. S., August Uihlein Fellow in Pharmaceutical Chemistry.

R. E. FOWLER, B. S., Assistant in Chemistry.

W. D. FROST, M. S., Instructor in Bacteriology.

A. T. LINCOLN, B. S., Fellow in Chemistry.

B. H. MEYER, Ph. D., Instructor in Sociology.

W. O. RICHTMANN, Ph. G., B. S., Instructor in Practical Pharmacy.

OSWALD SCHREINER, Ph. G., B. S., Instructor in Pharmaceutical Technique.

J. H. SCHROEDER, Assistant in Practical Pharmacy.

R. W. WOOD, B. A., Instructor in Physics.

GENERAL STATEMENT.

The prime object of the School of Pharmacy is to furnish a thoroughly scientific foundation for the pursuit of the profession of pharmacy. The elements of the fundamental natural sciences, chemistry, botany or biology, and physics must first be studied before their application to pharmacy can rationally be considered. This is as true for pharmacy as for any other applied science or art. In pursuing these general studies the pharmacy students have the advantage of close association with students from other courses. This implies that in these studies they must be able to keep abreast with students who are graduates of accredited high schools. The best preparation for college, therefore, which the prospective pharmacy student should seek is not that of the shops, but that of a good high school or academy of like rank. The University does not demand practical experience for admission to the courses in pharmacy, but desires such preparation as will best fit for college or university work.

The general study of these fundamental sciences is followed by more or less specialized courses. General chemistry, inorganic and organic, qualitative and quantitative analysis are followed by pharmaceutical chemistry and applied chemical analysis; general botany by vegetable histology and anatomy of drugs; general physics by pharmaceutical technique. These somewhat specialized studies, in turn, not only lay the foundation for the study of the more strictly applied courses in practical pharmacy and pharmacognosy, but also prepare the student for thesis work.

The student who can spend only two years at the University is compelled to take up the more technical studies of his course before he has laid a satisfactory foundation. Such a compromise

is outlined under *Courses of Study*. The three-year student, as a rule, finds time to pursue other studies besides those outlined above, *e. g.*, German, physiology, or bacteriology, etc. The four-year student has the great advantage of supplementing his high-school preparation during the freshman and sophomore years by acquiring a reading knowledge of German and French, and by the study of university mathematics, all of which studies are of the greatest importance when the more advanced work of the natural sciences is taken up during the junior and senior years.

Special attention is called to this four years' course offered to graduates of accredited high schools. The course was created in order to accommodate those students who desire to obtain a general scientific education and to include in their course the pharmaceutical studies, and with the hope of stimulating a broader pharmaceutical education. For the more applied courses special laboratories have been equipped.

Like the sister profession, medicine, pharmacy is in need, not only of the general practitioner, but also of the specialist. To meet the demands of such, the School offers graduate courses. Graduates who desire to prepare themselves as chemists for manufacturing establishments, as analytic or sanitary chemists or as bacteriologists, will find that the graduate courses of the School of Pharmacy as well as of the various colleges of the University offer excellent opportunities for advanced and more specialized study. Special lines of research can also be pursued in various departments by those who desire to work for a higher degree. The attention of advanced students is especially called to the graduate courses outlined on pp. 50-56.

Detailed information about studies in the four years' course and in the College of Science and Letters can be found on pp. 73-81.

The School of Pharmacy is an integral part of the University and is governed by the same general policy that characterizes the institution. The methods of work differ in no essential from those adopted by the other scientific departments. This School has from the beginning demanded a large amount of laboratory instruction, believing that none of the natural sciences can be adequately taught without considerable instruction in the laboratory, and, whenever necessary, in the field.

LABORATORIES.

A description of the general physical, chemical, and biological laboratories will be found on pp. 27-28; descriptions of the miner-

alogical laboratory on p. 28; of the assay laboratory on p. 183; of the bacteriological laboratory on p. 30; of the electro-chemical laboratory on p. 185.

PHARMACEUTICAL CHEMICAL LABORATORY. This is located on the third floor of North Hall. It affords ample accommodation to the advanced students. Every student is assigned a desk which he alone uses. The balance room is well equipped with Becker's, Sartorius', Eimer & Amend's, Nemetz's, Loemner's, and Bunge's balances, a torsion balance, etc. A Bunsen combustion furnace, a Glazer combustion furnace with the latest improvement after Anschütz and Kekulé, a Kopfer combustion furnace for compounds rich in halogen, a Kekulé gas furnace for heating substances in sealed tubes, nitrometers and much other chemical and physical apparatus can be used by the student, particularly in the experimental work for his thesis.

LABORATORY FOR PHARMACEUTICAL TECHNIQUE. This laboratory is equipped with apparatus and material for a more detailed and applied study of such chapters of mechanics and physics as are of special importance to the pharmaceutical student. It contains balance models, balances and measuring instruments of various kinds, complete apparatus for determining specific gravity according to different methods, a Laurent's polariscope, a Pulfrich's refractometer, Beckman's apparatus for the determination of molecular weights by the freezing and boiling point methods, apparatus for the determination of vapor densities. Besides these the laboratory is liberally supplied with apparatus for conducting the processes of distillation, sublimation, comminution, extraction, filtration, crystallization, drying, etc.

LABORATORY FOR PHARMACEUTICAL BOTANY AND PHARMACOGNOSY. The large room on the fourth floor, formerly used as lecture room, has been equipped with tables, microscopes, and lockers and is now used as a laboratory for botany and pharmacognosy. It accommodates a class of about thirty-five students and has a capacity when fully fitted out for about twenty more. The room is lighted in a manner favorable for microscopic work. During the past year a Naples paraffin bath and a Jung microtome have been added to the equipment of this laboratory.

The students in pharmacognosy working in this laboratory have further accommodations in the adjacent room occupied by the pharmacognostical collection, in the shape of lockers to contain the drug collections made use of in this branch of work.

LABORATORY FOR PRACTICAL PHARMACY AND DISPENSARY. On the first floor of North Hall a laboratory has been equipped for

individual rather than class instruction in practical pharmacy. It is well furnished with balances, percolation stands, extraction apparatus, a water motor, prescription case and all apparatus necessary in a complete laboratory of this kind. In the basement a room has been fitted to serve as comminution room, equipped with three drug-mills, mortars, sieves, etc.

COLLECTIONS.

The recent additions to the pharmaceutical collections have necessitated their entire rearrangement. New cabinets have been constructed, and better containers and a large number of illustrations have been purchased.

THE CHEMICAL COLLECTION contains: 1. Cabinet specimens of chemicals and minerals. The latter serve not only to supplement our knowledge of manufactured chemicals, but also to demonstrate the occurrence in nature of chemical elements and their compounds, also to illustrate in many instances the source of many artificial chemicals. Through the liberality of the United Alkali Company of England, some fifty specimens of their products in various stages of manufacture were obtained. Dr. William Simon of Baltimore has contributed a series of specimens illustrating the manufacture of bichromate and ferrocyanide of potassium. Numerous smaller donations have been received within recent years. 2. Chemical apparatus for the illustration of chemical operations and processes. 3. Charts illustrating chemical processes of manufacture, curves of solubility of classes of salts, chemical apparatus, etc.

THE PHARMACOGNOSTICAL COLLECTION found on the fourth floor in a room especially devoted to it has been very largely increased by purchases made at the World's Fair, these acquisitions consisting chiefly of drugs of Asiatic origin. Notable among them are a collection of fifty Ceylon drugs and medicines and a collection of more than one hundred Malay medicines. Worthy of mention are also a collection of 122 handsome specimens of essential oils and allied synthetic products liberally donated by Messrs. Schimmel & Co., of Leipzig, Germany; a collection of choice drugs from Messrs. Lehn and Fink, a materia medica cabinet from Parke, Davis & Co., a collection of official drugs from Schieffelin & Co., another from Gilpin, Langdon & Co., etc.

During the past year, the growth of the collection has made necessary the addition of several new cases. About three hundred new numbers have been added during the same time.

The general HERBARIUM is located in room 41, Science Hall, and is at all times accessible to persons desiring to use it. It is the intention to build up, as rapidly as possible, an herbarium of medicinal plants. For the present the latter will be housed in a room just off the large laboratory on the 4th floor of North Hall. At the present time this collection consists of about four thousand sheets.

A COLLECTION OF OBJECTS OF HISTORICAL interest has been begun, valuable contributions having been received from students and from several druggists of this state.

The biological and the mineralogical and geological museums in Science Hall are well equipped and full of interest to the student of the natural sciences.

LIBRARIES.

For a statement as to general library facilities at the University and in the city of Madison, see p. 26. The department library for ready reference is unusually well supplied with reference works and the best periodicals. The other department libraries, as well as the general library, are all on the same campus and, therefore, easy of access, the general library being open in the evening as well as the day.

TERMS OF ADMISSION.

To the Two Years' and Three Years' Courses.

Graduates from high schools are admitted without examination and without practical experience in a drug store.

Non-graduates are admitted if they comply with the following requirements:

They must be at least eighteen years of age.

They must present satisfactory certificates of *at least* one year's attendance from some standard high school, or its equivalent from a similar educational institution.

If possible, they should acquire, before coming to the University, a knowledge of high school mathematics and physics.

The time intervening between the secondary education and the college course should have been spent in a drug store, where physicians' prescriptions are regularly compounded.

To the Four Years' Course.

The terms of admission to this course are the same as those to the General Science Course, as given on page 63. No practical experience in pharmacy is required.

Students from other colleges or schools of pharmacy will be admitted on presentation of satisfactory certificates. However, no student who enters from another college will be admitted after November 1 of the year in which he intends to graduate.

DEGREES.

The degree of *Graduate in Pharmacy* (Ph. G.) is conferred upon candidates who have successfully met the requirements of either the Two or Three Years' Courses. No practical experience is required for graduation.

The degree of *Bachelor of Science in Pharmacy* is conferred upon candidates who have successfully met the requirements of the Four Years' Course.

The degree of *Master of Pharmacy* is conferred upon graduates of the shorter courses only after a year of residence at the University. They must pursue advanced work in some science or sciences allied to pharmacy, and present a dissertation embodying the results of an original investigation, which shall be satisfactory to the committee on higher degrees.

The degree of *Master of Science in Pharmacy* can be obtained by graduates of the Four Years' Course upon fulfillment of similar requirements.

PHARMACEUTICAL FELLOWSHIPS.

The August Uihlein Fellowship.

Mr. August Uihlein, of Milwaukee, in 1895 generously established a pharmaceutical fellowship on a financial basis of \$400 per annum. The holder of this fellowship during the year 1898-99 is Mr. William S. Ferris, B. S., U. W. '98.

The Fred Vogel Jr. Fellowship.

Mr. Fred Vogel, Jr., of Milwaukee, last year generously donated \$500.00 to be and in the support of graduate work. The sum was divided so as to establish a graduate scholarship of \$250.00 per annum for two years. The holder of this graduate scholarship for the year 1898-99 is Mr. V. H. Barret, A. B.

The United States Pharmacopoeia Research Scholarship.

The Committee on Revision of the U. S. Pharmacopoeia has for several years maintained an assistant in the School of Pharmacy for the purpose of conducting research in the line of revision of the Pharmacopoeia under the direction of the professor of pharmaceutical chemistry.

FEES AND EXPENSES.

No tuition is required from students who are residents of the State of Wisconsin; non-residents pay \$9.00 each semester.

The fee for incidental expenses is \$6.00 per semester.

These fees must be paid before the class cards can be issued.

The following statement applies to the laboratories of the School of Pharmacy only and does not include the charges made in the general chemical laboratories. For these see p. 39.

The laboratory fees should be paid within two weeks after the laboratory cards have been issued. For the general laboratory privileges, *i. e.*, desk-room, gas, water, general reagents, use of balances, microscopes, and other larger pieces of apparatus, a charge of one dollar per semester will be made for each fifth of a study; \$2.00 for a 2-5 study; \$3.00 for a 3-5 study, etc. A separate account will be kept with the accountant of the storage room for special apparatus and material. The student will purchase coupons from the Secretary (\$5.00 at a time) and present them at the storage room for what he draws out. At the end of the year full credit will be given for such pieces of apparatus as are taken back by the accountant in accordance with the rules of the storage room.

No diploma fee is required upon graduation.

The payment of all University charges is to be made to Mr. E. F. Riley, Secretary of the Board of Regents, at his office in the Law Building.

The cost of board in clubs is from \$2 to \$3 per week; in private families, from \$3 to \$4 per week; and rooms can be obtained in the city at correspondingly reasonable rates.

COURSES OF STUDY.**TWO YEARS' COURSE.****Junior Year.**

Chemistry, 1*; Pharmaceutical Botany, 1; Pharmaceutical Technique, all throughout the year.

Senior Year.

Chemistry, 5; Pharmaceutical Chemistry, 1, 2; Pharmaceutical Botany, 3; Pharmacognosy, 3 and 4; Practical Pharmacy, 1 and 2; Thesis.

*The figures refer to the numbers of the courses as given in the statements under Departments of Instruction, College of Letters and Science and School of Pharmacy.

THREE YEARS' COURSE.**Sophomore Year.**

Chemistry, 1; Pharmaceutical Botany, 1, or Biology, 1; Physics, Electives.

Junior Year.

Chemistry, 5; Pharmaceutical Chemistry, 1 and 2; Pharmaceutical Botany, 2; Pharmaceutical Technique; Pharmacognosy, 1; Practical Pharmacy, 3; Electives.

Senior Year.

Pharmacognosy, 1 and 2; Practical Pharmacy, 1 and 2; Thesis; Electives.

FOUR YEARS' COURSE.**Freshman Year.**

Biology, 1; German, 1; Mathematics, 1, 2; English, 2; Gymnastics, Military Drill.

Sophomore Year.

French, 3; Chemistry, 1; Physics, 1; Gymnastics, Military Drill; Electives.

Junior Year.

Pharmaceutical Chemistry, 1, 2, and 3; Pharmaceutical Botany, 2; Pharmaceutical Technique; Pharmacognosy, 1; Practical Pharmacy, 3; Electives.

Senior Year.

Pharmacognosy, 1 and 2; Practical Pharmacy, 1 and 2; Thesis; Electives.

The student should decide at the beginning of the junior year whether his major study is to be of a physical, chemical, or biological character, and arrange his work accordingly. During the second semester the subject for his thesis should be chosen in one of the departments in which he is doing his major work.

DEPARTMENTS OF STUDY.

CHEMISTRY.

PROFESSOR DANIELLS, ASSISTANT PROFESSOR HILLYER, ASSISTANT PROFESSOR KAHLENBERG, AND MR. LINCOLN.

The following courses are either required or frequently elected. For detailed information see pp. 121 to 124.

1. General Elementary Chemistry. Professor DANIELLS, Assistant Professor HILLYER, and assistants.
2. Advanced Inorganic Chemistry. Professor DANIELLS and assistants.
4. Toricology. Professor DANIELLS.
5. Quantitative Analysis for students in Pharmacy. Professor DANIELLS and Mr. LINCOLN.
7. Advanced Organic Chemistry. Assistant Professor HILLYER.
9. Physical Chemistry. Assistant Professor KAHLENBERG.
12. Research Work in Physical Chemistry. Assistant Professor KAHLENBERG.

PHARMACEUTICAL CHEMISTRY.

PROFESSOR KREMERS, MR. SCHREINER, MR. BASSETT, MR. FERRIS.

1. Pharmaceutical and Pharmacognostical Chemistry. This course consists of a review of general chemistry, inorganic and organic, with special adaptation of the subject-matter to the interests of pharmacy. Richter's Inorganic Chemistry, Berntsen's Organic Chemistry. Two lectures and one recitation. *M., Tu., Th.* Professor KREMERS.
2. Applied Chemical Analysis. Chemical analysis, qualitative and quantitative, gravimetric and volumetric, in its application to pharmacy. This will be chiefly a laboratory study. It will not, however, be merely a study of methods, but also of chemical principles involved. Professor KREMERS, Mr. SCHREINER, and Mr. FERRIS.

3. Reviews with critical reading of the text of the U. S. Pharmacopoeia as far as chemicals are concerned. W. Professor KREMERS.
4. Owing to the absence of Mr. Fischer a course on synthetic new remedies was substituted in place of the course on nitrogen derivatives announced last year. Most of the work was done by the topic system. Professor KREMERS.
- [5. Polymatonic alcohols of the paraffin hydrocarbons and their derivatives, with special reference to the chemistry of the sugars and glucosides. For advanced students and graduates. *Lecture, W., first semester.* Professor KREMERS.]
- [6. Hydrocymenes and derivatives, with special reference to the chemistry of volatile oils. For advanced and graduate students. *Lecture, W., second semester.* Professor KREMERS.]
7. Advanced laboratory work and thesis adapted to the individual. Professor KREMERS.
8. Physiological Chemistry. (a) A study of foods, body fluids, etc. Chemical analysis as applied to physiological chemistry. (b) A chemical study of urine. Laboratory work supplemented by lectures and recitations. Mr. BASSETT.

BIOLOGY.

PROFESSOR BIRGE, PROFESSOR HARPER, ASSISTANT PROFESSOR MARSHALL,
AND MR. SMITH.

For detailed information see pp. 128 to 130.

1. General Biology. Professor HARPER, Professor BIRGE, Dr. MARSHALL, and Mr. SMITH.
4. Human Physiology. Professor BIRGE.

PHARMACEUTICAL BOTANY.

ASSISTANT PROFESSOR CHENEY.

1. General Morphology of Plants. Corresponds to course 21 on p. 130. An elementary course. First semester, the morphology of fungi, algae, lichens, mosses, and ferns, illustrated by selected types. Second semester, the form and structure of the organs of seed plants, the identification of selected flowering plants and the preparation of an herbarium. The course will be supplemented by botanical excursions. *Daily, 8-10.* Excursions on Saturdays.

2. Vegetable Histology. Corresponds to course 16, p. 130. Systematic study of the tissues of phanerogams and ferns. Use of reagents and stains, modes of embedding, section cutting and mounting. Five times a week first semester, three times a week second semester. Hours on consultation. The work in this course is so arranged that students electing it may take it in either semester or both. For three and four year students.
3. Vegetable Histology. The same as course 2 for the first semester. For two year students.
4. Trees and their Characteristics. Corresponds to course 22, p. 130. A course designed for those who desire to acquaint themselves with forest trees. It contemplates a study of the vegetative and reproductive structures; the general habit and conditions of growth; the anatomy of the wood, etc. Lectures and laboratory work with occasional excursions. Those who expect to take this course should know how to use a microscope and should have had at least the equivalent of one semester's work in general botany. *Twice a week throughout the year.* May be taken either semester or both. Hours to be arranged on consultation.
5. Advanced Work in Anatomy. Special subjects for original investigation will be assigned to such students desiring to do advanced work as are properly qualified.

BACTERIOLOGY.

PROFESSOR RUSSELL, AND MR. FROST.

For detailed information see p. 131.

30. General Bacteriology. Professor RUSSELL and Mr. Frost.
31. Medical Bacteriology. Mr. Frost.
35. Communicable Diseases. Mr. Frost.
36. Biology of Water Supplies. Mr. Frost.

PHARMACOGNOSY.

ASSISTANT PROFESSOR TRUE.

1. Lectures. Brief introduction on development of our knowledge of plants furnishing remedies. Physiological action of main classes of drugs briefly sketched. Crude organic drugs discussed in the order of their natural re-

lationship. This course is meant to present to the student the main facts of the natural history of the plants yielding drugs, as, botanical description, habitat, history and cultivation, as well as the more strictly applied information. This course supplements the work done in the laboratory with the drugs themselves.

Two lectures per week during the second semester of the junior year and three per week during the first semester of the senior year. Required of three and four-year students.

2. Laboratory work for three-year or four-year students. Students are required to arrange systematically a collection of drugs, the material for which is in part purchased and in part collected by the students themselves. These drugs are studied, as far as possible, microscopically, and are regarded as objects of scientific interest as well as of a more technical significance. Drawings of the drug and of the preparations made by the students themselves call attention to the details of aspect and structure.

Three-fifths work during the first semester of the senior year, and five-fifths during the second semester. Required of seniors of the three and four-year courses.

3. This course will consist of text-book work supplemented by lectures and topics. The official and the most important non-official drugs will be studied. Text used: Sayre's Organic Materia Medica and Pharmacognosy.

Two-fifths, first semester; one-fifth, second semester.

Required of two-year seniors.

4. The laboratory work for two-year students will consist of an abridgment of course 2. Little microscopic work will be required.

Four-fifths in second semester of senior year.

5. For Pre-Medical Students. An abridgment of the work given to pharmacy students is offered for those intending to study medicine. As far as may be, the methods used are those detailed for the foregoing courses. No drug collection is required and no microscopic study is expected.

Three-fifths course during first semester. The lectures and two hours laboratory work per week.

- [6. Plant Ecology. This course will discuss the effects exerted on plants by the principal factors of their environment. Light, heat, winds, water supply, composition and texture of soil, competition with other organisms, animal and vegetable, parasitic and non-parasitic, assistance from other organisms, etc., are among the topics to be touched upon. The effect of these factors in determining plant distribution will receive some attention. In order to make the discussions concrete, frequent excursions will be made to points characterized by different sets of ecological conditions.

Three lectures per week during the second semester.]

7. Physiology of Certain Plant Constituents. In this course, certain plant products of general interest will be discussed from the standpoint of plant physiology. Among them may be mentioned the tannins, volatile oils, resins, sugars, starch, gums, etc.

One lecture weekly, second semester.

8. Advanced laboratory work and thesis adapted to the individual.

PHYSICS.

PROFESSOR SNOW, ASSISTANT PROFESSOR AUSTIN, MR. WOOD, MR. SMITH,
MR. FERRY, AND MR. SHEDD.

For detailed information see pp. 118 to 121.

1. General Lectures and Introductory Laboratory Practice.
Professor Snow and assistants.
15. Introductory Physics. This will consist of a course of lectures designed exclusively for students in the two-years' and three-years' course in pharmacy. Three times a week. Mr. Wood.

PHARMACEUTICAL TECHNIQUE.

MR. SCHREINER.

1. Pharmaceutical Operations. Laboratory practice in the use of the balance; calibration of measuring flasks, graduates, burettes, and pipettes; manipulation of glass and other subjects of a mechanical nature. The testing and calibrating of thermometers; methods of desiccation, extraction dialysis, filtration, distillation, sublimation and

crystallization. Principally laboratory work, supplemented by lectures and recitations. Required of all juniors. Three-fifths for the first semester.

2. Laboratory Practice in the Determination of Physical Constants. Determination of specific gravity according to various methods; melting points and boiling points of substances; optical rotatory power and index of refraction of liquids and solutions. Vapor density determinations and the use of Beckmann's apparatus for determining molecular weights by the lowering of the freezing point and elevation of the boiling point of solutions. Principally laboratory work, supplemented by lectures, recitations, and topic work. Required of all juniors. Three-fifths for the second semester.
3. Molecular Weight Determinations. A detailed study of the molecular theory and molecular weight determination by chemical and physical methods. This course must be preceded by course 2. Lecture and laboratory work. Two-fifths for the first semester.
4. Advanced work adapted to the individual, including laboratory work in preparation for thesis.

PRACTICAL PHARMACY.

MR. RICHTMANN.

1. Theory and Practice of Pharmacy. Class work, 2 hours a week during both semesters.

History of pharmacopoeias and discussion of U. S. Pharmacopoeia. Review of subject of metrology. Pharmaceutical operations, as comminution, solution, crystallization, dialysis, filtration, clarification, decolorization, percolation, distillation, desiccation, etc. Galenical preparations, as solutions, tinctures, fluid extracts, extracts, spirits, oleo-resins, pills, suppositories, ointments, plasters, etc. Apparatus used in pharmaceutical operations brought before the class and discussed. Prescription reading. Incompatibilities.

2. Operative Pharmacy. Laboratory work. A three fifths course throughout the year.

Examination of commercial articles, chemicals, and vegetable drugs, including assaying of the latter. Manufacture of galenical preparations, chemicals and scale salts, and testing of

same when finished. Preparations are so selected as to represent all classes official in the U. S. P.

Compounding of physicians' prescriptions with special reference to those cases in which difficulties are liable to occur.

3. Operative Pharmacy. Laboratory work. For juniors of the three and four years' course. Two-fifths during second semester.

This course is continued during the senior year as course 2, being merely an extension of the latter.

5. Special work adapted to the individual, including laboratory work in preparation for thesis.

LAW APPLIED TO PHARMACY.

PROFESSOR GREGORY.

A course of lectures treating of the validity and construction of laws especially restraining the practice of pharmacy; of the liability of pharmacists both criminal and civil; for their own violations of laws and that of their agents; also for their own negligence and that of their agents. Given in second semester, 1898-99.

FIRST AID TO THE INJURED.

DR. HEAD.

A series of lectures upon the first care of emergency cases, embracing essential, anatomical and physiological principles; methods of preventing or combating shock after injuries; checking hemorrhage, manipulation for resuscitation of the asphyxiated; indications for the administration of some of the emergency remedies, and the practical demonstration of the application of temporary dressings.

THE ECONOMIC FUNCTIONS OF THE STATE.

DR. MEYER.

This course consists of a series of lectures, historical and critical, on the state in its relation to industry, trade, and the professions, with special reference to pharmacy. *First semester, 1898-99.*

All correspondence or inquiries relating to the School of Pharmacy should be addressed to Professor Edward Kremers, Madison, Wis.

SCHOOL OF MUSIC.

STAFF OF INSTRUCTION.

- C. K. ADAMS, LL. D., President.
F. A. PARKER, *Director*, Musical History, Harmony, Counterpoint, and Organ.
J. S. SMITH, Piano.
ADA BIRD, Piano.
ALICE S. REGAN, Piano.
ADELAIDE FORESMAN, Voice.
CHARLES NITSCHKE, Violin, Cello, and other orchestral instruments.
HJALMAR O. ANDERSON, Mandolin.
ELIZABETH M. KEELEY, Harp.
Mrs. M. E. BRAND, Guitar.
MYRON M. FOWLER, Banjo.
WILLIAM M. FOWLER, Secretary.

GENERAL ANNOUNCEMENT.

It is the purpose of the School of Music to furnish superior facilities for the study of music in any or all of its departments, theoretical or practical. The members of the Faculty are teachers of acknowledged ability and large experience. Instruction is offered in organ, piano, harp, singing, orchestral instruments, mandolin, guitar, and banjo, and in musical theory, choral practice, harmony, counterpoint and composition. In the study of piano or of singing (voice culture) instruction is given by means of private or individual lessons, or, should a sufficient number of students desire it, classes limited to three will be organized. In the study of other instruments, private lessons only are employed. In the theoretical studies students are recommended to join the University classes, but private lessons may be arranged for if preferred.

To meet the convenience of students residing either permanently or temporarily in distant parts of the city, an office and

studios have been opened in the Kroncke building, in addition to those in Ladies' Hall at the University. Application for lessons may be made at either place, the lessons being given where it is found to best suit the convenience of instructor and student.

The lessons vary in length and number per week, for the purpose of adequately meeting the wants of all classes of students, from those who take a large amount of work in other departments of the University to those who devote themselves especially to the study of music with little or no collateral work. In like manner the fees for special instruction vary according to the length and frequency of lessons. These fees, which are given on page—?, are believed to be as low as possible for competent instruction.

It should be observed that special instruction in vocal or instrumental music of any kind may be taken by students not otherwise connected with the University, and that such students are not required to pay the incidental fee.

The general classes in Musical Theory, Harmony, Counterpoint, History of Music, and Musical Composition may be taken as electives by students of the College of Letters and Science, who will receive credit for them, as for other studies. These classes are likewise open to students of the other colleges and schools of the University without extra fees.

Students of the School of Music, not otherwise connected with the University, may be admitted to these classes on the payment of the usual incidental fee charged to students of the College of Letters and Science, viz.: \$6 per semester. The tuition fee for students not residents of the State is not required.

A statement of courses and classes follows. For a statement of credits, see announcements under "Music," in "Departments of Instruction," page 132.

COURSES.

There are two general courses, as follows:

I. The Collegiate Course,

in which the requirements for admission are the same as for the general courses in the College of Letters and Sciences, or for adult special students, together with such proficiency in some department of music, as is mentioned in the out-

lined courses of study. A graduate's diploma will be granted on the completion of this course. Three years of study are required, including the courses in Musical Theory, Harmony, History of Music, or their equivalents. It is, however, recommended that students extend the time to four years to enable them to take a larger proportion of general studies.

II. The Academic Course,

open to persons not members of the University, and also to University students who do not desire to enter the Collegiate Course pursuant to graduation. Students of this course may, however, be admitted to the musical classes of the University on the payment of the usual incidental fees charged to students of the College of Letters, but will not be considered candidates for graduation or diploma. A certificate of excellence will be granted worthy students of this course on examination, after not less than three years of study.

OUTLINE OF COURSES OF STUDY.

I. COLLEGIATE COURSE.

Piano.

Applicants for admission will be expected to play music of the grade of Haydn's *Sonata No. 2*, or Mozart's *Sonata No. 1*, Cotta edition, and Heller's *Etudes, Op. 47*.

Mason's, Zwintscher's or Plaidy's *Technics* throughout the course.

First Year: Kuhner, *Instructive Albums*, II. and III. Löw, *Etudes, Op. 233*. Loeschhorn, *Op. 52* and *Op. 66*. Czerny, *Studies in Velocity*. Bach, *Little Preludes and Inventions*.

Second Year: Heller, *Op. 46* and *45*. Czerny, *Fingerfertigkeit*. Jensen, *Op. 32*. Cramer-Bülow, *Etudes*. Marmontel, *Mecanisme*. Bach, *Well-Tempered Clavichord*.

Third Year: Tansig, *Studies*. Kullak, *Octave School*. Moscheles, *Op. 70*. Clementi, *Gradus ad Parnassum*. Chopin, *Preludes and Etudes*.

Selections of the grade of *Perpetual Motion* by Weber; *Arabeske* by Schumann; *Impromptu, Op. 29*, by Chopin; *Variations, Op. 54*, by Mendelssohn; *Sonata Appassionata* by Beethoven.

It is not supposed that a rigid course can be given which will meet the requirements of individual students, but the foregoing

outline represents, in a general way, the character of each year's work. Etudes especially are named, because they indicate grade and character of requirements more clearly than can be done otherwise. No single student is expected to take more than a portion of the studies mentioned, and equivalents are liberally used to suit individual cases. On the other hand, these studies are supplemented by ample selections from classic and modern authors for use in the parlor or concert room.

Organ.

No previous knowledge of organ playing is required. The student must be well grounded in piano playing, be possessed of a correct technique, and be able to read plain four-part music.

The course of study is continuous, beginning with Stainer's *Organ School* or Whiting's *First Six Months on the Organ* and following with the larger works of Rink and Best, supplemented by special studies by Thayer, Buck, Ritter, Schneider, Volckmar, and others. Selections from Bach's organ works, Mendelssohn's Sonatas and the compositions of modern composers are used.

Careful training is given in playing church music and voluntaries, the use of stops and the mechanism of the instrument.

Voice.

The student must be able to read plain music and must have had an amount of training equal to the first half of Concone's Fifty Lessons, and comprising the usual technical study for the same period.

First Year: Tone Placing, Breathing, and Phrasing; Ballad Singing and the Sostenuito style. Technical and other studies of the grade of Bonaldi's Six Vocalizes, Concone's Fifteen Vocalizes, Marchesi's Exercises, Op. 21, Book I., etc. Easy forms of Italian and German Songs.

Second Year: Studies of the grade of Schubert's *Manual of Vocal Technic*, Schubert's *Special Studies*, Marchesi's *Vocalizes*, Op. 21, Book II., Bordogni's *Bravura Studies*. More difficult German and French songs, and easy oratorio and operatic arias.

Third Year: Study of Cadenzas and larger forms of execution. Recitative and the more difficult oratorio and operatic arias.

On graduation the student will be expected to sing acceptably selections (according to voice and school) from such songs and

arias as: "He Was Despised," "Angels Ever Bright and Fair," "I Know That My Redeemer Liveth," and "Thou Shalt Break Them," by Handel; "With Verdure Clad," "Rolling in Foaming Billows," and "In Native Worth," by Haydn; "If With All Your Hearts," "It is Enough," and "O Rest in the Lord," by Mendelssohn; "Ah Non Giunge," by Bellini; "Infelice," by Verdi; "Roberto, tu che Adoro," by Meyerbeer; "Vedrai Carino," by Mozart; "Una Voce," and *Pro Peccatis*, by Rossini.

Violin.

First Year: Hermann, *Scale Studies*. Kayser, *Violin Instructor, I. and II.* Herbert Ries, *Violin School, Part I.* Easy melodious solos.

Second Year: Kayser, *Violin Instructor, III.* Kayser, *Etudes, Op. 20.* Schubert, *Violin School, IV.* Herbert Ries, *Violin School, Part II.* Solos by Viotti, Rode, De Beriot.

Third Year: Schradieck, *Violin Technic.* De Beriot, *School, Part II.* *Etudes* by Dont, Kreutzer, and Schubert.

Solos by De Beriot, Leonard, Vieuxtemps, and Wieniawski.

THEORETICAL STUDIES.

Musical Theory and Choral Practice.

A one year course, twice a week, in the general theory of music, including notation, scale construction, intervals, distinction of rhythm, etc., combined with a practical study of sight reading and choral singing.

This course is especially recommended to all students, whether of instrumental or vocal music, as furnishing a substantial foundation for all other work.

Harmony and Counterpoint.

The student must be able to read and play simple four-part music.

First Year: Review of scales and intervals, triads, seventh chords, augmented sixth chords, modulation, synopsis of suspension and appoggiatura.

Second Year: Detailed treatment of modulation, suspension, appoggiatura, etc. Harmonizing melodies. Simple counterpoint.

*Third Year: Double counterpoint, canon and fugue.

History of Music.

A course of lectures, twice a week, extending through the year. In the first semester the lectures give a general survey of music before the Christian era, and down to the eighteenth century.

The second semester is devoted to the eighteenth and nineteenth centuries.

***Musical Composition.**

A one year course, twice a week. One year of harmony is required as preparation.

II. ACADEMIC COURSE.

There are no requirements for entrance. Students are received and graded according to ability and amount of previous study. This course in all departments leads up to and overlaps the collegiate course. Students after reaching the proper stage of preparation may be transferred to the collegiate course, or may remain in the academic course, the works of the last three years being identical in both courses. But no certificate of excellence will be issued to any student who is not thoroughly fitted to enter the second year of the collegiate course.

Guitar, Banjo, and Mandolin.

In response to the demand growing out of the popularity of these attractive instruments, the School of Music provides ample and excellent opportunities for their study. Special attention is given to expression, technique, and proper fingering. In general, correct methods leading to the highest proficiency are employed.

Text-books for Guitar: Carcassi, Sor, Ferranti, Holland, and Langey.

Text-books for Banjo: Dobson, Stewart, Henning, and others.

Text-books for Mandolin: School of Wessenberg, and Progressive Studies by Guiseppi Branzoli, supplemented by solo selections.

*The courses in counterpoint, etc., and in musical composition are inserted here under their proper headings, because they are frequently taken as electives, but they represent graduate work for the students of the School of Music.

Orchestra.

The University Orchestra meets for rehearsal every Saturday forenoon. The purpose of the organization is the study of orchestral music, both light and serious. It is open to all students who have sufficient knowledge of any orchestral instrument to pursue the work profitably. Those who take the rehearsals regularly are entitled to credit of one hour per week.

Band.

A military band has likewise been organized, open to all students on conditions similar to those mentioned for the orchestra.

Choral Union.

The Choral Union is an organization of students of the University and citizens of Madison for the purpose of studying the oratorios and larger choral works of ancient and modern authors, interspersed with lighter part-songs and glees, and adequately presenting the same in public performance. Very successful performances of Handel's *Messiah*, and *Judas Maccabaens*, Haydn's *Creation*, and Mendelssohn's *Elijah*, and *St. Paul*, have been given, and other works of similar magnitude will follow.

Applicants for membership are expected to be able to read plain music at sight. The rehearsals are held weekly from October until May. The annual membership fee is one dollar.

Recitals and Concerts.

Student recitals, free to all students, and open to all others by invitation, are held at intervals during the collegiate year. Recitals and concerts by eminent artists are given from time to time at a low price to students of the School of Music.

Tuition.

The school year is divided into two semesters corresponding with the divisions of the University year. The following charges for tuition are uniformly for a semester of eighteen weeks:

Two lessons a week.

	$\frac{1}{2}$ -hour lessons.	$\frac{3}{4}$ -hour lessons.	Hour lessons.	In class of 3 hour lessons.
Piano	\$27 00	\$40 00	\$50 00	\$18 00
Voice	27 00	40 00	50 00	18 00
Organ .....	.....	.....	54 00	.....
Violin, etc.....	18 00	27 00	.....	.....
Guitar, etc.....	18 00	27 00	36 00	.....

One lesson a week.

	½-hour lessons.	¾-hour lessons.	Hour lessons.
Piano	\$15 00	\$22 00	\$27 00
Voice	15 00	22 00	27 00
Organ .....	.....	.....	27 00
Vjolin, etc.....	9 00	13 50	.....
Guitar, etc.....	.....	15 00	20 00
Diploma fee .....	.....	.....	5 00

Theoretical studies are taken in the University classes, and those who are not otherwise connected with the University are expected to pay the incidental fee of the College of Letters, which is \$6.00 a semester. This fee, however, is not required of those taking only individual lessons in singing, or on some instrument.

Students are not received for less than one semester except by permission of the Director of the School of Music. Students are allowed, however, to pay the tuition fees by the half-semester in advance.

No student is entitled to lessons until tuition has been paid and a receipt secured from the Secretary of the Board of Regents.

No deduction can be made for absence from lessons, except for long continued illness, in which case the School of Music will share the loss equally with the student.

No student is expected to take part in any public entertainment without the consent of his teacher and the Director.

Students who, by reason of deficient musical ability, neglect of study, or any other valid reason, fail to make satisfactory progress, may be dropped from the classes.

The pianos in Ladies' Hall may be used for practice for a limited number of hours daily by students of the University on payment of a fee of from four dollars to ten dollars per semester. Pianos may be rented from dealers at from three to six dollars a month.

The office of the Director in Ladies' Hall at the University will be open for several days before the opening of each semester for the reception of pupils and assignment of lessons. After the opening of the University the Director may be found daily at Ladies' Hall from 10 to 11, or at the office in the Kroncke building from 9 to 10.

For further information, address

F. A. PARKER, Director, 14 W. Gilman St., or
W. M. FOWLER, Secretary, 719 State St.,

Madison, Wis.

DEGREES CONFERRED.

COMMENCEMENT, 1898.

BACHELOR OF ARTS.

Ancient Classical Course.

Kate May Corscot.	John Smith Main.
Hattie Josephine Griffin.	Eve Parkinson.
Richard Guille Harvey.	Maude Parkinson.
Charles Frederick Hagemann.	Maud Huntley.
Fred Spiegelberg.	Ernst Hildebrand Kronshage.

Greek Group.

Anna Nyhan Scribner.

BACHELOR OF LETTERS.

Modern Classical Course.

Elizabeth Johanna von Briesen.	John Anthony Marlowe.
Agnes Chapman.	Grace Merrill.
Joseph Edward Davies.	Annette Nelson.
Ernst Otto Eckelmann.	Katharine Campbell Noyes.
Mary Louise Freeman.	Amelia Maud Schreiber.
Kate Louise Goodell.	Charles Mitchell Secker.
Grace Greenbank.	Jessie Josephine Sias.
Grace Graham.	Ella Knowles Smith.
Arlene Edna Grover.	Harriet Frances Stephenson.
David Arthur Hanks.	Lucy Estella Tompkins.
Sarah Elizabeth Hurlbut.	James Parsons Weter.
Alvin Henry Iwert.	Charles Louis Wolf.
Charles Eugene Joannes.	Maud Woy.
Clarissa Augusta Linde.	Christine Ramsay Wright.

Grace Anna Wright.

English Course.

Fannie Carleton.	Anna Norsman.
Alfred Charles Kingsford.	Martin Odland.
George Daniel Luetscher.	Adeline Benson Rockwell.
Harriet Emily McCulloch.	Letitia Rowena Snively.

Civic Historical Course.

Grace Ethel Bailey.	Clara Ellida Hegg.
Mary Rogers Barker.	Joseph Gustav Hirschberg.
Theodore Berg.	Edessa Luella Kunz.
William Carl Berg.	Addie W. Loeper.
Otto Bosshard.	Henry Stuart Markham.
Mary Evelyn Bump.	George Bliss Nelson.
Alice Elizabeth Carlton.	Jessie Louise Nelson.
Albert James Chandler.	Otto Patzer.
May Elizabeth Church.	Dora Luella Penniston.
Harley Ross Colver.	Charles Nelson Peterson.
Alice Gertrude Cushing.	Frederick Burns Peterson.
Alice Beatrice Dacy.	Jeremiah Patrick Riordan.
Bertrand Herrick Doyon.	Herbert Henry Ryan.
Elmore Theodore Elver.	Dwight Alexander Sanborn.
Karl Ernest Enteman.	John Christian Schmidtman.
Harry Gustavus Forrest.	Rebecca Shapiro.
Henry Shockley Gierhart.	Louise Dalziel Shearer.
Clara Abigail Glenn.	Albert Clifton Shong.
Louis Allen Goddard.	Lloyd Dean Smith.
Pauline Priscilla Gunthorp.	Edmund Suhr.
Horace Whitney Hardy.	Herbert Henry Thomas.
William Henry Hay, Jr.	Norman Amos Wigdale.
John Howard Young.	

English Group.

Gertrude Maud Cairns.

German Group.

Harriot Burnton.	Frances Gay Perkins,
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Hebrew Group.

James William Irish.	William Washburn Moore.
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History Group.

Grace Elizabeth McNair.

Mathematics Group.

Louise Marie Bird. George Martin Link.
Charles Max Mason.

Norse Group.

Hjalmar Rued.

BACHELOR OF SCIENCE.**General Science Course.**

Mary Olivia Allen.	Esther Gordon.
Edward Blumer.	Jessie Case Hart.
Ray Bowers.	Knudt Knudtson.
Leslie Rush Burns.	Arthur William Meyer.
Anna Livingston Burton.	Henry William Ochsner.
William Darrow.	Jehn Wesley Raymer.
Rolla Ullin Cairns.	George Banks Reedal.
David John Davis.	Julia Ruebhausen.
Ernst George Ehlman.	August Sauthoff.
Glen Roy Fabrick.	Edward Alexander Schmidt.
William Brown Ford.	Charles Albert Squire.
Camille Alphonse Hermand Fortier.	James Harrison Van Vorhis.
Roy Edward Fowler.	Frank Walter Van Kirk.
Robert James Gay.	Guido Charles Vogel.
Joseph Frank Wojta.	

Mathematics Group.

Edward Lee Hancock. Eliza Robinson.

Physics Group.

Lillie Elda Dellé Moessner.

Civil Engineering Course.

Bert Campbell.	Hugo Nelson Merriam.
Robert Charles Elser.	George William Pope.
Arthur Rudolph Fugina.	Otto Schafer.
Thomas Anton Gerlach.	Max Henry Spindler.
Lebrecht Julius Klug.	David Youngs Swaty.

Mechanical Engineering Course.

Fred William Bentley.	Paul Frederick Lueth.
Clarence William Boynton.	Henry Charles Schneider.
Henry Roy Crandall.	Anton Malec.
Russell William Hargrave.	Halsten Joseph Berford Thorkelson.
Fred Karl Landgraf.	Horace Ray Warner.
Walter Adolph Zinn.	

Electrical Engineering Course.

James Ashton.	Marshall Ehle Seymour.
Rudolf Ernst Heine.	Allard Smith.
Robert Daniel Jenne.	Harrison Arthur Smith.
John G. Kremers.	Philip Sheridan Smith.
Oscar Martin Leich.	Harry Spence.
Frederick Jacob Newman.	Max William Zabel.

Pharmacy Course.

Clement Luesther Bobb.	Florence Meta Gage.
William Stewart Ferris.	Martha Morris James.
Harry Elmo Stephens.	

BACHELOR OF PHILOSOPHY.

Clara Chamberlain Porter, as of the class of 1865.

BACHELOR OF PHILOSOPHY IN PEDAGOGY.**Philosophical Course.**

Christopher Andrew Donnelly.	Mary Bashford Huff.
Frederick Arthur Harrison.	

GRADUATE IN PHARMACY.

Frederick William Alden.	Clarence Alfred Krogh.
Wallace Edward Hendricks.	John Hugo Schroeder.
Robert William Hindley.	Herman Frederick Schwarz.
Charlotte Frances James.	Alfred Clayton Shepard.
Edward Charles William Koske.	Enos Samuel Wigdale.

BACHELOR OF LAWS.

Lewis Losey Alsted.	Walter Washington Kauwertz.
Martin M. Angwick.	Ira Bird Kirkland.
Dennis Francis Blewett.	Albert Herman Krugmeyer.
Ezra Roy Burgess.	John Frank Kulig.
Homer Caswell Clark.	Charles William Magne.
William James Conway.	Jay Howard Magoon.
Cyrus Washington Dolph.	Henry Victor Meyrose.
Frederick Charles Ellis.	Frank Joseph Rowan.
Harvey Jay Frame.	Reginald Ivar St. Peters.
William Sumner Frazier.	Albert Henry Schmidt.
Martin James Gillen.	Norman Stockett.
William Edson Griswold.	Robert Allen Upham.
John Michael Harnan.	Ray Newton Van Doren.
Charles Lewis Harper.	Edgar Beach Warren.
Raymond Asa Hollister.	Adolph John Weidner.

GRADUATE IN MUSIC.

Eleanor Beattie Bliss.	Blanche Mary Hayden.
Alice Beatrice Dacy.	Nettie Mills.
Maud Beryl Fordyce.	Clara Olsen.
Sophy Marie Goodwin.	Adda Josephine Westenhaver.

HIGHER DEGREES.**MASTER OF ARTS.**

Anna Cecilia Griffiths, B. A. (Univ. of Wis.), in Greek and Latin—*Thesis: "Alcibiades: a character study from the original sources."*

MASTER OF LETTERS.

Willard Grosvenor Bleyer, B. L. (Univ. of Wis.), in English Literature and English Philology—*Thesis: "The Tristan Saga in English literature."*

Georgine Zetelle Fraser, B. S. (Wellesley College), in History and Economics—*Thesis: "The growth of popular forces in colonial Maryland."*

Sabena Mildren Herfurth, B. L. (Univ. of Wis.), in German Philology and French—*Thesis: "Eine grammatische darstellung der sprache des liedes vom Hürnen Seyfrid."*

May Hunt, B. L. (Univ. of Wis.), in English Literature and German—*Thesis: "A study of the sea in the greater Victorian poets."*

Gisaburo Ishikubo (College of Tokio), in Economics and History—*Thesis: "The origin and growth of Japanese taxation."*

MASTER OF SCIENCE.

William Chandler Bagley, B. S. (Mich. Agr. Coll.), in Pedagogy—*Thesis*: “*A study in the correlation of mental and motor ability in school children.*”

Harry Alexis Harding, B. S. (Univ. of Wis.), in Bacteriology—*Thesis*: “*The life history of Bacillus campestris, a bacterial plant parasite.*”

Andrew Phillip Hollis, B. S. (Univ. of Wis.), in Pedagogy and Philosophy—*Thesis*: “*The Oswego movement in education.*”

Azariah Thomas Lincoln, B. S. (Univ. of Wis.), in Chemistry and Geology—*Thesis*: “*Solutions of silicates of the alkali metals.*”

Henry Charles Wolff, B. S. (Univ. of Wis.), in Applied Mathematics and Geology—*Thesis*: “*The rotation period of the earth in early geological time.*”

MASTER OF SCIENCE IN MATHEMATICS.

John Howell Griffith, B. S. (Univ. of Wis.), in Civil Engineering and Mechanics—*Thesis*: “*Secondary stresses in ordinary truss bridges.*”

MECHANICAL ENGINEER.

Walter Alexander, B. S. (Univ. of Wis.)—*Thesis*: “*Tests of the Refrigerating Plant in the Laboratory of the University of Wisconsin.*”

William Herman Kratsch, B. S. (Univ. of Wis.)—*Thesis*: “*Tests of the Refrigerating Plant in the Laboratory of the University of Wisconsin.*”

Wallace Francis MacGregor, B. S. (Univ. of Wis.)—*Thesis*: “*Tests of the Refrigerating Plant in the Laboratory of the University of Wisconsin.*”

ELECTRICAL ENGINEER.

Victor William Bérghenthal, B. S. (Univ. of Wis.), Alternating Currents and Mathematical Electricity—*Thesis*: “*A commercial test of insulated wires.*”

Charles Frederick Burgess, B. S. (Univ. of Wis.), Electro-Chemistry and Electrical Transmission of Power—*Thesis*: “*The measurement of insulation resistance.*”

Howard Scott Webb, M. E. (Univ. of Maine), Alternating Currents and Applied Electro-Magnetism—*Thesis*: “*Pressure and current curves of an alternating current dynamo.*”

Roy Rodney Wiley, B. S. (Univ. of Mich.), Alternating Currents and Applied Electro-Magnetism—*Thesis*: “*Some tests made on the Madison street railway.*”

DOCTOR OF PHILOSOPHY.

Katharine Allen, M. A. (Univ. of Wis.), Latin, Greek, and English Literature—*Thesis*: "*The treatment of nature in the poetry of the Roman republic.*"

Myron Eugene Baker, M. A. (Harvard Univ.), English Literature, English Philology, and Philosophy—*Thesis*: "*Tennyson and Browning: a study in the conflict of personality and art.*"

Ernest Robertson Buckley, B. S. (Univ. of Wis.), Geology, Petrography, and Botany—*Thesis*: "*The building and monumental stone of Wisconsin.*"

Paul Samuel Reinsch, B. A., LL. B. (Univ. of Wis.), History, Political Science, and Economics—*Thesis*: "*The attitude of the American colonies to the English common law.*"

Samuel Weidman, B. S. (Univ. of Wis.), Geology, Petrography, and Chemistry—*Thesis*: "*The geology of the pre-Cambrian igneous rocks of the Fox River valley, Wisconsin.*"

HONORARY DEGREES.**DOCTOR OF LAWS.**

James Barr Ames, A. M., LL. B. (Harvard Univ.),
Dean of the Harvard Law School.

Henry L. Palmer,
President of the Northwestern Mutual Life Insurance Company of Milwaukee.

MECHANICAL ENGINEER.

Magnus Swenson, B. Met. E., M. S. (Univ. of Wis.),
Vice-President and Secretary of the Walburn-Swenson Company of Chicago.

HONORS IN SPECIAL STUDIES.

Joseph Edward Davies, in Political Science—*Thesis*: "*Judge and jury: an historical treatise on their respective provinces in civil and criminal causes.*"

Hattie Josephine Griffin, in Latin—*Thesis*: "*Cicero's views concerning the place of literature in his own life.*"

Ernst Hildebrand Kronshage, in English Literature—*Thesis*: "*The influence of Coleridge on American literature to 1845, with special reference to criticism.*"

Paul Frederick Lueth, in Mechanical Engineering—*Thesis*: “*The influence of compression on the efficiency of internal combustion engines.*”

Grace Elizabeth McNair, in History—*Thesis*: “*The relations of the students and citizens at Paris, 1200 to 1350.*”

Lillie Elda Delle' Moessner, in Physics—*Thesis*: “*A photographic study of diffraction phenomena.*”

Otto Patzer, in History—*Thesis*: “*The French Revolution as reflected in the Jacobin Club, 1789 to 1794.*”

Anna Nyhan Scribner, in Greek—*Thesis*: “*The influence of Euripides on Browning.*”

Rebecca Shapiro, in French Philology—*Thesis*: “*The history of the negative in French.*”

Harrison Arthur Smith, in Electrical Engineering—*Thesis*: “*The heating of armatures.*”

Harry Spence, in Electrical Engineering—*Thesis*: “*The heating of armatures.*”

Halsten J. B. Thorkelson, in Mechanical Engineering—*Thesis*: “*The influence of compression on the efficiency of internal combustion engines.*”

GRADUATES.

Number of University Graduates, 1854-1898,	3,521	1898,	216
Ancient Classical Course,	364	.	11
Modern Classical Course,	404	.	33
English Course,	227	.	11
Civic Historical Course,	219	.	47
General Science Course,	554	.	34
Philosophical Course, . . . . .	...	.	3
Normal Course (1865-68),	25	.	...
Engineering Courses,	300	.	33
Law Course,	1,222	.	30
Pharmacy Courses,	159	.	14
Agricultural Course,	12	.	0

STUDENTS.

FELLOWS AND SCHOLARS.

- Bassett, Victor Hugo, A. B., 313 Charter st.
 Fred Vogel Jr. Fellow in Pharmaceutical Chemistry.
- Bates, Nellie Page, Ph. D., 202 Langdon st.
 Honorary Fellow in Economics.
- Chandler, Elwyn Francis, M. A., 212 W. Gorham st.
 Fellow in Applied Mathematics, Room 1, University Hall.
- Clark, Joseph Warren, M. A., 426 Jane st.
 Fellow in Greek, Room 9, University Hall.
- Copeland, Edwin B., Ph. D., 412 N. Carroll st.
 Honorary Fellow in Biology.
- Ferris, William Stewart, B. S., 703 State st.
 August Uihlein Fellow in Pharmaceutical Chemistry.
- Griffin, Hattie Josephine, B. A., 224 W. Gorham st.
 Alumni Fellow in Latin.
- Hoag, Ernest Bryant, B. A., B. S., 148 W. Gilman st.
 Honorary Fellow in Biology.
- Hunt, May, M. L., 706 University ave.
 Fellow in English, Room 28, University Hall.
- Jenks, Albert Ernst, B. S., 301 Lake st.
 Honorary Fellow in Economics.
- Lane, Wilmot Burkemar, M. A., 115 N. Broom st.
 Fellow in Philosophy, Room 34, Science Hall.
- Lincoln, Azariah Thomas, M. S., 224 Murray st.
 Fellow in Chemistry, Chemical Laboratory.
- O'Connor, Charles James, B. A., 1242 E. Dayton st.
 Fellow in Latin, Room 29, Science Hall.
- Shedd, John Cutler, M. S., 823 W. Dayton st.
 Fellow in Physics, Room 17, Science Hall.
- Shiozawa, Massasada, B. A., 603 E. Johnson st.
 Honorary Fellow in Economics.
- Taylor, Henry Charles, M. S. A., 221 Langdon st.
 Fellow in Economics.
- Ward, Louis Merrick, B. L., 138 W. Gorham st.
 Fellow in History, Room 51, University Hall.
- Watts, Jenny Chamberlain, M. A., University Heights.
 Fellow in History, Room 51, University Hall.

SCHOLARS.

- Burnton, Harriot, B. L., 250 Langdon st.
The Madison Graduate Scholarship in German Philology.
- Kronshage, Ernst Hildebrand, B. A., . . . 625 Langdon st.
The John C. Freeman Graduate Scholarship (English).
- McNair, Grace Elizabeth, B. L., 1039 University ave.
Graduate Scholarship in European History.
- Rued, Hjalmar, B. L., 213 W. Gilman st.
The Norwegian Graduate Scholarship (English).
- Sanborn, John Bell, M. L., 210 Langdon st.
Graduate Scholarship in American History.
- Scribner, Anna Nyhan, B. A., 308 N. Carroll st.
The William F. Allen Graduate Scholarship (Greek and Latin).

RESIDENT GRADUATES.

- Allen, Katharine, Ph. D., Univ. of Wis., *Madison.*
Latin.
- Beddall, Marcus Melvin, B. L., Univ. of Wis., *Trim Belle.*
History, Economics.
- Bleedorn, Bertha Ida, B. L., Univ. of Wis., *Janesville.*
German, French, Spanish.
- Brauer, Herman Gustav Adolph, Ph. B., A. B.,
Colorado College, *Adelaide, So. Australia.*
French, German, Italian.
- Campbell, Bert, B. S., Univ. of Wis., *Evansville.*
Sanitary and Electrical Engineering, Chemistry, Bacteriology.
- Cook, Alfred Newton, M. A., Knox College, *Madison.*
Chemistry, Mineralogy.
- Davies, Joseph Edward Payton, B. L., Univ.
of Wis., *Watertown.*
Political Science, History.
- Elwell, Mattie Laura, B. L., Univ. of Minn., *Minneapolis, Minn.*
History.
- Ford, Guy Stanton, B. L., Univ. of Wis., *Grand Rapids.*
Modern European History, American History.
- Ford, William Brown, B. S., Univ. of Wis., *Sparta.*
Bacteriology, Materia Medica, Economics.
- Fowler, Roy Edward, B. S., Univ. of Wis., *Wauwatosa.*
Chemistry, Mineralogy.

- Freeman, Mary Louise, B. L., Univ. of Wis., *Madison*.
English Literature, Rhetoric.
- Frost, William Dodge, M. S., Univ. of Minn., *Madison*.
Bacteriology, Botany, Chemistry.
- Gage, Florence Meta, B. S., Univ. of Wis., *Madison*.
Pharmaceutical Chemistry, Physiology,
German, French.
- Gay, Robert James, B. S., Univ. of Wis., *Madison*.
Bacteriology, Histology.
- Greenbank, Grace, B. L., Univ. of Wis., *Madison*.
Semitic Languages, Pedagogy, Latin.
- Harding, Albert Spencer, M. A., Univ. of
Nebr., *Brookings, S. Dak.*
Economics, Political Science, History.
- Harding, Neva Whaley, B. S., S. Dakota Ag-
ricultural College, *Brookings, S. Dak.*
English Literature, American History.
- Hardy, Clarence Foster, B. L., Univ. of Wis., *Waukesha*.
Chemistry, Embryology.
- Hargrave, William Ernest, A. B. Ripon, *Ripon*.
Latin, German.
- Harper, Mildred Lewis, M. L., Univ. of Wis. *Madison*.
English Literature, English Philology,
History.
- Harrison, Frederick Arthur, Ph. B., Univ. of
Wis., *Elkhorn*.
Philosophy, Mathematics.
- Hastings, Edwin George, B. Sc., Ohio State
Univ., *Austinburg, O.*
Dairy Chemistry, Bacteriology.
- Hayden, Estelle Mary, B. L., Univ. of Wis., *San Prairie*.
Literature, History.
- Herfurth, Sabena Mildred, M. L., Univ. of Wis., *Madison*.
German Philology.
- Ishikawa, G. Sadakuni, Graduate of Anglo-
Japanese College, *Tokio, Japan*.
Political Economy, Political Science.
- Iwert, Alvin Henry, B. L., Univ. of Wis., *Watertown*.
Philosophy, German.
- Joliffe, William Morley, B. S., Lawrence Univ. *Berlin*.
Mathematics, Physics, Astronomy.

- Kirschoffer, William Gray, B. S., Univ. of Wis., *Madison.*
Sanitary Engineering.
- Knudtson, Knudt, B. S., Univ. of Wis., *Moscow.*
Animal Husbandry, Chemistry.
- Kyle, John Campbell, B. S., Iowa State Coll., *Glidden, Ia.*
Electrical Engineering.
- Lee, Carl Emil, B. S., College of Agricultural, *Fingal, N. Dak.*
Dakota,
Dairying.
- Leith, Charles Kenneth, B. S., Univ. of Wis. *Madison.*
Geology, Petrology, Physical Chemistry,
Theoretical Physics.
- Lombard, John Edward, M. E., Tulane Univ. *New Orleans, La.*
Railway Engineering.
- Luetscher, George David, B. L., Univ. of Wis., *Sauk City.*
History, Economics.
- McCarthy, Charles, B. P., Brown University, *Brockton, Mass.*
History, Economics, Political Science.
- Magnusson, Carl Edward, M. S., Univ. of Minn. *Stark, Minn.*
Physics, Mathematics, Chemistry.
- Mason, Max, B. L., Univ. of Wis., *Madison.*
Mathematics, Astronomy, Physics.
- Mathews, Hubert Berton, B. S., S. Dakota Ag-
ricultural College, *Brookings, S. Dak.*
Physics.
- Meisnest, Frederick William, B. S., Univ. of Wis., *Madison.*
German, Anglo-Saxon.
- Nelson, Annette, B. L., Univ. of Wis., *Madison.*
Latin, German.
- Odle, James Francis, B. S., Kansas Agricul-
tural College, *Brook, Ind.*
Bacteriology, Agricultural Chemistry.
- Parkinson, Eva, B. A., Univ. of Wis., *Madison.*
English Literature, English Philology,
Rhetoric.
- Parkinson, Maude, B. A., Univ. of Wis., *Madison.*
French, Italian, Pedagogy.
- Patzer, Otto, B. L., Univ. of Wis., *Wausau.*
French, German, Spanish.

- Pengra, Charlotte Elvira, B. S., Univ. of Wis., *Madison*.
Mathematics, Economics, Philosophy.
- Raymer, John Wesley, B. S., Univ. of Wis., *Cadiz*.
Physical Chemistry, Geology.
- Reynolds, Everett Adelbert, B. L., Univ. of
Wis., *Bassett*.
History, Philosophy.
- Rosenstengel, Rudolph, B. S., Univ. of Wis., *Madison*.
Electrical Engineering.
- Running, Theodore, M. S., Univ. of Wis., *Viroqua*.
Mathematics.
- Sanborn, Dwight Alexander, B. L., Univ. of
Wis., *Milwaukee*.
Chemistry.
- Schafer, Joseph, B. L., Univ. of Wis., *Madison*.
History, Philosophy.
- Schreiber, Amelia Maude, B. L., Univ. of Wis., *Madison*.
German, Latin, English Literature.
- Schreiner, Oswald, Ph. G., B. S., Univ. of Wis., *Baltimore, Md*.
Mathematics, Mineralogy.
- Schuster, Otto John, B. S., Univ. of Wis., *Pewaukee*.
Philosophy, Biology.
- Sensiba, Marie Georgia, B. S., Knox College, *Green Bay*.
History, Literature, French.
- Sessinghaus, Gustavus, E. M., Columbia Uni-
versity, *St. Louis, Mo*.
Mineralogy, Petrology, Electrical Engi-
neering.
- Smith, Ella Katharine, B. L., Univ. of Wis., *New Richmond*.
Latin, German, Pedagogy.
- Smith, Grant, B. S., Univ. of Wis., *Madison*.
Botany, Biology.
- Spindler, Max Henry, B. S., Univ. of Wis., *Dale*.
Civil Engineering.
- Stangeland, Charles Emil, A. B., Augsburg
Theological Seminary, *Eagle Grove, Ia*.
Economics, Sociology.
- Storms, Albert Boynton, A. S., Univ. of Mich. *Madison*.
Philosophy, History.
- Terry, Grace Larkin, B. L., Univ. of Wis., *Wingra Park*.
German Philology, English Literature.

- Towne, Ezra Thayer, B. L., Univ. of Wis., *Waupun.*
Economics, History.
- Veerhusen, Elsbeth, B. A., Univ. of Wis., *Madison.*
German Philology.
- Walbridge, Fannie Rose, B. L., Univ. of Wis., *Beloit.*
Pedagogy, English Philology, English
Literature.
- Warming, Jens Christian Jespersen, Graduate
University of Copenhagen, *Copenhagen, Denmark.*
Political Economy.
- Welty, Grace DeWitte, B. A., Rockford Coll., *Rockford, Ill.*
Economics, History, Sociology.
- Whitney, Myrta Viola, B. A., Northwestern
Univ., *Ripon.*
Latin, Greek.
- Youker, Henry Sherwood, B. S., Univ. of Wis., *Madison.*
Mathematics, Physics.
- Young, Allyn Abbott, Ph. B., Hiram College, *Rapid City, S. Dak.*
Economics, American History.

GRADUATES STUDYING IN ABSENTIA.

- Gale, Zona, B. L., *Milwaukee.*
English Literature, History.
- Swezey, Goodwin Deloasos, A. M., *Lincoln, Neb.*
Astronomy.
- Thomas, Benjamin, B. S., *Princeton, N. J.*
Hebrew and N. T. Greek.
- Weinzirl, John, B. S., *Albuquerque, N. M.*
Bacteriology.

UNDERGRADUATES.

COLLEGE OF LETTERS AND SCIENCE.

Senior Class.

- | | | |
|---------------------------|----------------------|------------------|
| Ableiter, Theodore Louis, | <i>Boscobel,</i> | C. H. |
| Adams, Clara Dane, | <i>Sechlerville,</i> | Phil. |
| Adams, Myrtle Grace, | <i>Beloit,</i> | M. C. |
| Allen, Charles Elmer, | <i>Madison,</i> | G. S. (Botany.) |
| Allen, Eldreth Gordon, | <i>Madison,</i> | G. S. (Phys.) |
| Allen, Philip Loring, | <i>Madison,</i> | C. H. |
| Anderson, Lewis Albert, | <i>Mt. Horeb,</i> | Eng. (Pol. Sci.) |
| Andrews, Helen Grace, | <i>Lodi,</i> | Eng. |

Anthony, Anna Gertrude,	<i>Madison,</i>	G. S.
Axley, Frederick William,	<i>Madison,</i>	G. S.
Aylward, Joseph John,	<i>Black Earth,</i>	Eng.
Baldwin, Jay Burdett,	<i>Evansville,</i>	Eng. (Hist.)
Beerbaum, Adolph Frederick,	<i>Waterloo,</i>	G. S.
Benson, Gideon,	<i>Richland Center,</i>	G. S.
Bibbs, Emma Marion,	<i>Madison,</i>	Eng.
Block, Manfred Sickie,	<i>Platteville,</i>	C. H.
Blodgett, Maude Catherine,	<i>Sharon,</i>	Eng.
Borgers, William Benjamin,	<i>Neillsville,</i>	A. C.
Bush, Nellie Martha,	<i>Sparta,</i>	M. C.
Butt, Margaret Elizabeth,	<i>Viroqua,</i>	M. C.
Calkins, Ernest Eugene,	<i>Delavan,</i>	Eng.
Campbell, Daisie,	<i>Hudson,</i>	Eng.
Carter, Harry Nathan,	<i>Humbird,</i>	G. S.
Case, Lillian,	<i>Madison,</i>	A. C.
Cederstrom, John Alfred,	<i>Kandiyohi, Minn.,</i>	Phil.
Chamberlain, Alonzo Albert,	<i>Darlington,</i>	Eng.
Chamberlain, Harlem Roy,	<i>Darlington,</i>	Eng.
Chapman, Bertha Estelle,	<i>Plainfield,</i>	Eng.
Chase, Wilfrid Earl,	<i>Madison,</i>	G. S.
Chubbuck, Alice Louise,	<i>Madison,</i>	Eng. (Math).
Churchill, Arthur Moore,	<i>Marinette,</i>	A. C.
Cloes, Grace Gage,	<i>Lake Bluff, Ill.,</i>	M. C.
Cole, Orsamus,	<i>Milwaukee,</i>	M. C.
Connell, Marion Theresa,	<i>Fond du Lac,</i>	Eng.
Cook, Matilda Viola,	<i>Madison,</i>	M. C.
Curtis, Nathan Stephenson,	<i>Madison,</i>	Eng.
Darling, William Sylvester,	<i>Madison,</i>	G. S.
Davies, Charles George,	<i>Spring Green,</i>	G. S.
Deans, Margaret Isabelle,	<i>River Falls,</i>	Phil.
Denu, Albert Rudolph,	<i>Madison,</i>	Eng.
DeReamer, Gertrude Elizabeth,	<i>Fond du Lac,</i>	M. C.
Desmond, Cora Frances,	<i>Fox Lake,</i>	Eng.
Dopp, Mary,	<i>Oconomowoc,</i>	G. S.
Driver, Bert Ormond,	<i>Darlington,</i>	Eng.
Ela, Emerson,	<i>Rochester,</i>	M. C.
Ellison, Wanda Gladys,	<i>Darlington,</i>	Eng.
Emerson, John Bolles,	<i>Madison,</i>	G. S.
Engel, Frank Henry,	<i>Madison,</i>	Eng.
Fargo, Elsie Rutherford,	<i>Lake Mills,</i>	M. C.
Fiske, Lulu Blanche,	<i>Burlington,</i>	A. C.

Fowler, Helen*Ada,	<i>Madison,</i>	M. C.
Fox, Edward Tappan.	<i>Milwaukee,</i>	M. C.
Friend, Alice Relaine,	<i>Milwaukee,</i>	M. C.
Gabel, Charles Ernst,	<i>Milwaukee,</i>	G. S.
Gaenslen, Frederick Julius,	<i>Milwaukee,</i>	G. S.
Gage, Florence Meta,	<i>Madison,</i>	G. S.
Gale, Gladys,	<i>Reedsburg,</i>	G. S. (Math.)
Galpin, Lloy,	<i>Madison,</i>	Phil.
Gates, Frederick William,	<i>Pickwick, Minn.,</i>	Phil.
Gibson, Edith Van Slyke,	<i>Madison,</i>	M. C.
Goddard, Jennie Elvira,	<i>Chippewa Falls,</i>	M. C.
Griffith, Max Wilder,	<i>Milwaukee,</i>	M. C.
Hagemann, John August,	<i>Mauston,</i>	Phil.
Haight, George Ives,	<i>Rockdale,</i>	C. H. (Hist.)
Hanchett, Ruth May,	<i>Sparta,</i>	M. C.
Hanson, Albert,	<i>Eau Claire,</i>	G. S.
Hatton, Edward Howard,	<i>Madison,</i>	C. H.
Heimdal, Sara Guenvor,	<i>Madison,</i>	Eng. (Math.)
Hinkley, Lucretia French.	<i>Milwaukee,</i>	A. C.
Holmes, Harvey Robson,	<i>Geneva, Minn.</i>	Phil.
Hopkins, George Allen.	<i>New York, N. Y.</i>	A. C.
Houghton, Anna Pauline,	<i>Racine,</i>	G. S.
Howe, Winfred Chester,	<i>Sheboygan,</i>	C. H. (Hist.)
Huenkemeier, Etta,	<i>Freeport, Ill.,</i>	Eng.
Hutson, Charles Thomas,	<i>Edgerton,</i>	Eng.
Inglis, John Percy,	<i>Bayfield,</i>	Eng.
Jacobson, Marcus,	<i>Waukesha,</i>	Eng.
Jeffrey, John Jonas,	<i>Centralia,</i>	Eng.
Jenney, Adeline Miriam,	<i>Huron, S. D.,</i>	A. C.
Johnson, Lillian Gertrude,	<i>Decorah, Ia.,</i>	M. C.
Jones, Lewis Albert,	<i>Georgetown,</i>	Phil.
Jones, Warren Gilbert,	<i>Oregon,</i>	Eng. (Heb.)
Kasson, Alice Palmer,	<i>Madison,</i>	A. C.
Keech, Elizabeth Margaret,	<i>Waupun,</i>	C. H. (Hist.)
Kienholz, Albert Aaron,	<i>Bellingham, Minn.,</i>	Phil.
Kies, William Samuel,	<i>Oshkosh,</i>	M. C.
Kline, Catherine Genevieve,	<i>Beloit,</i>	M. C.
Koltes, Frank Xavier,	<i>Madison,</i>	G. S.
Kurtz, Frank Howard,	<i>Milwaukee,</i>	Eng.
Lamb, Charles Emery,	<i>Bangor,</i>	Phil.
Langemo, Peter Cornelius,	<i>Kenyon, Minn.,</i>	Eng.
Laube, Frank Joseph,	<i>Brodhead,</i>	Eng.

Lee, Jessamine,	<i>Vermillion, S. D.</i> , Eng. (Eng.)
Lipe, Olive,	<i>Mt. Morris, Ill.</i> , Eng.
Lyle, Frank William,	<i>Ripon</i> , M. C.
McBride, Rosa Lillian,	<i>Platteville</i> , Phil.
McCoy, Nettie Irene,	<i>Madison</i> , Eng.
McCumber, Anna Levina,	<i>Fond du Lac</i> , Eng.
McCumber, Mary Etta,	<i>Fond du Lac</i> , M. C.
McKitrick, Marcella May,	<i>Viroqua</i> , M. C.
McMillan, Antoinette,	<i>Appleton</i> , A. C.
Malec, Marie,	<i>Madison</i> , Eng.
Mashek, Anna,	<i>Kewaunee</i> , Eng.
Medbury, Eliza Estella,	<i>Elkhorn</i> , M. C. (Math.)
Meeker, Guy Abbott,	<i>Marshalltown, Ia.</i> , C. H.
Mehl, Hugo,	<i>Milwaukee</i> , G. S.
Meisnest, Frank William,	<i>Branch</i> , Phil.
Miller, Mary Elizabeth,	<i>Racine</i> , Eng.
Miller, Maud Elsie,	<i>Edgerton</i> , A. C.
Mitchell, Thomas William,	<i>Cuba City</i> , Eng.
Montgomery, Milton Gray,	<i>Omaha, Neb.</i> , C. H.
Moore, Lydia Emma,	<i>Madison</i> , Eng.
Murrish, Harry John,	<i>Mazomanie</i> , Eng.
Murrish, Maud Grace,	<i>Mazomanie</i> , Eng.
Nelson, Edith,	<i>Madison</i> , A. C.
Nuzum, Willard Otto,	<i>Brooklyn</i> , Eng. (Heb.)
Odell, Susan,	<i>Des Moines, Ia.</i> , M. C.
O'Neill, Ernest Andrew,	<i>Neillsville</i> , M. C.
Pahlow, Edwin William,	<i>Madison</i> , Eng. (Hist.)
Pearson, Samuel E.,	<i>Madison</i> , Phil.
Pengra, Mabel Agnes,	<i>Madison</i> , A. C.
Persons, Warren Milton,	<i>Madison</i> , G. S. (Math.)
Pinkum, Anna Shaw,	<i>Eau Claire</i> , C. H.
Pollard, Eliza Alwilda,	<i>Madison</i> , M. C. (Math.)
Pratt, Grant Ellsworth,	<i>Stoughton</i> , Phil.
Pyre, Walton Hawkins,	<i>Madison</i> , Eng.
Radensleben, Frank Ernest A.,	<i>Eau Claire</i> , C. H.
Random, Gilbert,	<i>Oshkosh</i> , G. S.
Reed, Louis,	<i>Ripon</i> , M. C.
Rice, Ole S.,	<i>Madison</i> , G. S.
Rickfort, William Otho,	<i>Lake Mills</i> , G. S.
Riley, Mabel Victoria,	<i>Madison</i> , G. S.
Roberts, David Milton,	<i>Madison</i> , A. C.
Robertson, William Spence,	<i>Oxford</i> , C. H. (Hist.)

Rountree, Mary Mitchell,	<i>Platteville,</i>	Phil.
Ruediger, William Charles,	<i>Alma,</i>	Phil.
Ruschhaupt, Louis Fred,	<i>Milwaukee,</i>	G. S.
Ryan, Ferne,	<i>Reedsburg,</i>	Eng.
Sceets, Laura Alice,	<i>Milwaukee,</i>	Eng.
Schumaker, Raymond H.,	<i>McGregor, Ia.,</i>	Eng.
Shaw, Eliza Harper,	<i>Geneseo, Ill.,</i>	A. C.
Shaw, Joseph Lawrence,	<i>Geneseo, Ill.,</i>	A. C.
Sheldon, Stewart Harris,	<i>Madison,</i>	G. S.
Shopbell, Martha,	<i>Janesville,</i>	G. S.
Short, Nathan Green,	<i>Dodgeville</i>	C. H.
Sieker, William Christian,	<i>Manitowoc,</i>	G. S.
Stahl, Henry Vincent,	<i>Bayfield,</i>	Eng.
Stair, Crystal,	<i>Evansville,</i>	Eng.
Stangel, Charles George,	<i>Tisch Mills,</i>	G. S.
Stauff, John Henry,	<i>Milwaukee,</i>	A. C.
Staver, Frances Mary,	<i>Monroe,</i>	Eng. (Eng.)
Stock, Alma,	<i>Madison,</i>	Eng.
Stone, Jesse Raymond,	<i>Burnett,</i>	Eng.
Stillman, Gertrude,	<i>Milwaukee,</i>	G. S. (Math.)
Stuntz, Stephen Conrad,	<i>Monroe,</i>	G. S. (Botany.)
Sykes, Maud,	<i>Janesville,</i>	Phil.
Sylvester, Genevieve,	<i>Milwaukee,</i>	C. H.
Thompson, Cora,	<i>Beloit,</i>	Eng.
Thompson, George,	<i>Moscow,</i>	Eng. (Phil.)
Thompson, James,	<i>Moscow,</i>	Eng.
Thomson, Fred,	<i>Tomah,</i>	Eng.
Todd, Sharp William,	<i>Madison,</i>	C. H.
Tormey, Thomas William,	<i>Madison,</i>	G. S.
Trettien, August William,	<i>Madison,</i>	C. H.
Van Dusen, Harmon Lewis,	<i>Montfort,</i>	Phil.
Verplanck, Helen Gertrude,	<i>Madison,</i>	M. C.
Vilas, Charles Atwood,	<i>Milwaukee,</i>	A. C.
Watson, Frank Hosford,	<i>Milwaukee,</i>	G. S.
Webster, Thomas,	<i>Elk Grove,</i>	Phil.
Weld, Laura Hayden,	<i>River Falls,</i>	Phil.
Westover, Minnie Comstock,	<i>Madison,</i>	G. S.
White, Adaline,	<i>Madison,</i>	M. C.
White, Allen Orvis,	<i>Madison,</i>	M. C.
Williams, Daniel Jenkins,	<i>Genesee Depot,</i>	A. C.
Wright, Luther Millard,	<i>New London,</i>	G. S.

Junior Class.

Abbott, Lottie J.,	<i>Westfield,</i>	Phil.
Adams, Edna Couper,	<i>Madison,</i>	Eng.
Adams, Harry Wilford,	<i>Black Earth,</i>	Eng.
Adams, William Frazier,	<i>Mukwonago,</i>	A. C.
Albrecht, Sebastian,	<i>Milwaukee,</i>	G. S.
Allen, Florence Eliza,	<i>Madison,</i>	C. H. (Math.)
Anderson, Andrew Kunni,	<i>Melvina,</i>	A. C.
Andresen, Oliver Sverre,	<i>Medford,</i>	Eng.
Arnold, Lizzie May,	<i>Oshkosh,</i>	Phil.
Austin, Rollan Melvin,	<i>Monroe,</i>	G. S.
Bachhuber, Charles Hugo,	<i>Mayville,</i>	Eng.
Baker, Helen Leona,	<i>Colton, N. Y.,</i>	A. C.
Barber, Winchel Fay,	<i>Waukesha,</i>	C. H.
Bertles, Anne Caroline,	<i>Green Bay,</i>	M. C.
Blackburn, Kathryn Irene,	<i>Madison,</i>	Phil.
Bleekman, Adelbert E.,	<i>La Crosse,</i>	A. C.
Bolender, Charles Barton,	<i>Monroe,</i>	A. C.
Bowden, Josephine Horton,	<i>West Salem,</i>	Eng.
von Briesen, Ernst,	<i>Columbus,</i>	C. H.
Brigham, Bertha Blanche,	<i>Evansville,</i>	M. C.
Brown, Hester Adeline,	<i>Berlin,</i>	A. C.
Brown, John Sears,	<i>Sparta,</i>	G. S.
Brown, Luther Edward,	<i>Rhineland,</i>	A. C.
Buck, Florence Trask,	<i>Platteville,</i>	Phil.
Burnham, Charles Lewis,	<i>Milwaukee,</i>	A. C.
Carney, Francis Joseph,	<i>Eau Claire,</i>	Eng.
Cashel, May,	<i>Arcadia,</i>	Eng.
Cassels, George Snowden,	<i>Tomah,</i>	G. S.
Castle, Mildred Alice,	<i>Black River Falls,</i>	Eng. (Rom'ce.)
Challoner, Grace Mary,	<i>Oshkosh,</i>	A. C.
Clark, William Barnard,	<i>Belleville,</i>	Eng.
Cochems, Edward Bulwer,	<i>Sturgeon Bay,</i>	Eng.
Coen, Benjamin Franklin,	<i>Rensselaer, Ind.,</i>	C. H.
Cook, Edward Albert,	<i>Madison,</i>	Eng.
Craig, Louise,	<i>Viroqua,</i>	M. C.
Crosby, Francis Hinckley,	<i>Kankakee, Ill.,</i>	C. H.
Damuth, Libbie M.,	<i>Ft. Atkinson,</i>	C. H.
Darling, Frank Edward, Jr.,	<i>Madison,</i>	G. S.
Davis, Jessica Esther,	<i>Madison,</i>	G. S. (Phys.)
Devine, Clark Bailey,	<i>Oregon,</i>	G. S.
Dillingham, Grace Louise,	<i>Baraboo,</i>	M. C.

Dillon, Joseph Golder,	<i>Sterling, Ill.,</i>	G. S.
Dorset, Bernard Charles,	<i>La Crosse,</i>	A. C.
Dreyer, John William,	<i>Fitchburg,</i>	G. S.
Eastman, Clarence Winans,	<i>Portage,</i>	G. S.
Egdahl, Anfin,	<i>Menomonie,</i>	G. S.
Elmer, Walter Edgar,	<i>Hustler,</i>	Eng.
Everts, Leslie Shinoe,	<i>Rice Lake,</i>	Eng.
Farrand, Roy Felton,	<i>Madison,</i>	Eng.
Ferris, George Neb,	<i>Whitewater,</i>	C. H.
Fischer, Carl Elisha,	<i>Bayfield,</i>	Eng.
Fletcher, Mabel,	<i>Portage,</i>	G. S. (Zool.)
Fraser, Rebecca Smith,	<i>Lake Beulah,</i>	Eng.
Fries, Mary Belle,	<i>Richland Center,</i>	Eng.
Gath, Amelia Caroline,	<i>Madison,</i>	M. C.
Goldsmith, Elliott Robert,	<i>River Forest, Ill.,</i>	C. H.
Goodwin, John Edward,	<i>Madison,</i>	Eng.
Greverus, Ernst,	<i>New Holstein,</i>	C. H.
Gribble, Greta May,	<i>Platteville,</i>	Phil.
Grimm, August,	<i>Two Rivers,</i>	Phil.
Grindell, Arthur Bates,	<i>Platteville,</i>	G. S.
Gunderson, Henry Adolph,	<i>Rio,</i>	Eng. (Pol. Sci.)
Hall, Roy Dykes,	<i>Burnett Junct.,</i>	G. S.
Hardgrove, George Patrick,	<i>Fond du Lac,</i>	Eng.
Harvey, Leta Alice,	<i>Madison,</i>	Phil.
Haskin, Walter Edwin, Jr.,	<i>Milwaukee,</i>	G. S.
Herrick, William K.,	<i>Cherokee, Ia.,</i>	C. H.
Heyward, Richard,	<i>Kirkland, Ill.,</i>	Phil.
Hibbard, Carlisle V.,	<i>Racine,</i>	G. S.
Hinkley, Louise,	<i>Janesville,</i>	M. C.
Hobbins, Harry Mears,	<i>Madison,</i>	M. C.
Hoffman, Frank,	<i>St. Wendel,</i>	Eng.
Holden, Roy Jay,	<i>Sheboygan Falls,</i>	G. S. (Bot.)
Honeywell, Jesse Frank,	<i>Monroe,</i>	A. C.
Hook, Edward Alfred,	<i>S. Milwaukee,</i>	G. S.
Hutton, Margaret Meiklejohn,	<i>Whitewater,</i>	A. C.
Jackson, Alice Fanny,	<i>Madison,</i>	M. C.
Jackman, Marcia Maria,	<i>Janesville,</i>	M. C.
Joannes, Ralph Lillis,	<i>Green Bay,</i>	C. H.
Johns, Richard Bowen,	<i>Madison,</i>	Phil.
Johnson, Axel Edward,	<i>Madison,</i>	A. C.
Johnson, Nora Francesca,	<i>Rockdale,</i>	M. C.
Jones, Oliver Milton,	<i>Georgetown,</i>	Phil.

Kellogg, John Richard,	<i>Elgin, Ill.,</i>	Phil.
King, Bessie Susan,	<i>Neillsville,</i>	M. C.
Klinkhammer, Susan Catherine,	<i>Cassville,</i>	Phil.
Koch, Arthur Alexander,	<i>Beaver Dam,</i>	G. S.
Koffend, Joseph, Jr.,	<i>Appleton,</i>	Eng.
Kolb, Philip Amon,	<i>Platteville,</i>	Phil.
Lee, Kenelm Julius,	<i>Chippewa Falls,</i>	G. S.
Loeb, Joseph,	<i>Appleton,</i>	C. H.
Lowell, Susie Eugenia,	<i>Janesville,</i>	M. C.
Lucas, Sarah May,	<i>Brodhead,</i>	M. C.
Lyle, Stuart,	<i>Madison,</i>	M. C.
McArdle, Michael William,	<i>Baileys Harbor,</i>	Eng.
McCartney, Albert Joseph,	<i>Madison,</i>	C. H.
McClernan, Marie Helen,	<i>Janesville,</i>	A. C.
McFadden, Mary Isabel,	<i>Madison,</i>	Phil.
McGilvra, Sadie Love,	<i>Baraboo,</i>	M. C.
McKenna, Corey Hugh,	<i>Platteville,</i>	G. S.
McKenna, Francis Eugene,	<i>Madison,</i>	Phil.
McLean, Marion Clara,	<i>Monroe,</i>	M. C.
McNeel, James Herbert,	<i>Fond du Lac,</i>	A. C.
MacGrau, Mae Maud,	<i>Chippewa Falls,</i>	M. C.
Maercklein, Ella Dorothea,	<i>Milwaukee,</i>	G. S.
Magnusson, Herman Victor,	<i>Stark, Minn.,</i>	Phil.
Minnick, Paul W.,	<i>Kewance, Ill.,</i>	C. H.
Monahan, Daniel George,	<i>East Troy,</i>	G. S.
Montgomery, Ida Margarette,	<i>Rosendale,</i>	M. C.
Moseley, Wayne Thornton,	<i>Madison,</i>	C. H.
Moser, Alma Marie,	<i>Ashland,</i>	A. C.
Mosher, George Warner,	<i>Prophetstown,</i>	C. H.
Murphy, Daniel Hayes,	<i>Milwaukee,</i>	G. S.
Nelson, Norman Oscar,	<i>Madison,</i>	G. S.
Newman, Julius John,	<i>Horicon,</i>	Phil.
Nicholson, John Frederick,	<i>Brodhead,</i>	G. S.
Niven, John McKean,	<i>Sheridan,</i>	A. C.
Northrop, George Norton,	<i>Platteville,</i>	M. C.
Nuzum, Jesse Ann,	<i>Viroqua,</i>	Eng.
Ochsner, Emma Julia,	<i>Chicago, Ill.,</i>	G. S.
Orchard, Milton,	<i>Shullsburg,</i>	Phil.
Osborne, John Goodrich,	<i>Milwaukee,</i>	M. C.
Palmer, Bernard Morey,	<i>Janesville,</i>	C. H.
Parks, Edna May,	<i>Crystal Falls, Mich.,</i>	A. C.
Pearce, Charles Sumner,	<i>Walworth,</i>	Eng.

Pearson, William Henry,	<i>Lancaster,</i>	Phil.
Pease, Raymond Burnett,	<i>Oregon,</i>	Eng.
Peck, Roy Walter,	<i>Milwaukee,</i>	M. C.
Petschke, Edward Ernst,	<i>Madison,</i>	A. C.
Pfisterer, Clara Christine,	<i>Brodhead,</i>	Eng.
Pierce, Helen Augusta,	<i>Chicago, Ill.,</i>	Eng.
Pierpont, David Cowee,	<i>Milwaukee,</i>	G. S.
Poss, Benjamin,	<i>Milwaukee,</i>	Eng.
Preuss, Bertha Helen,	<i>Belle Plaine,</i>	Phil.
Ramsay, Sarah Isabella,	<i>Madison,</i>	A. C.
Reed, Miriam Keith,	<i>Madison,</i>	M. C.
Rhodes, Arthur Lee,	<i>Sparta,</i>	Phil.
Richardson, Annice True,	<i>Eldorado, Kan.,</i>	C. H.
Robinson, Irving Porter,	<i>Milwaukee,</i>	C. H.
Robinson, Lavinia Bertha,	<i>Platteville,</i>	Phil.
Roethe, Emil Leo,	<i>Whitewater,</i>	Phil.
Ross, Lura Llorá,	<i>Hudson,</i>	Eng.
Rothman, Emma,	<i>Chilton,</i>	Eng.
Ruediger, Gustave Ferdinand,	<i>Alma,</i>	G. S.
Russell, Henry Alexander,	<i>Ft. Scott, Kan.,</i>	C. H.
Saby, Sever,	<i>Baldwin,</i>	Phil.
Sawyer, Elsa Amelia,	<i>Hartford,</i>	Eng.
Scanlan, Dennis Francis,	<i>Madison,</i>	C. H.
Scheer, George Henry,	<i>Sheboygan,</i>	G. S.
Schultz, Alfred Reginald,	<i>Tomah,</i>	G. S. (Phys.)
Seiler, Livia Estelle,	<i>Alma,</i>	M. C.
Sheldon, Mabel,	<i>Reedsburg,</i>	Eng.
Sherman, Gertrude,	<i>Milwaukee,</i>	A. C.
Siefert, Carl Frederick,	<i>Milwaukee,</i>	G. S.
Slatter, Frances,	<i>Sun Prairie,</i>	G. S. (Math.)
Smith, Allard Johnson,	<i>Milwaukee,</i>	C. H.
Smith, Clara Elizabeth,	<i>Platteville,</i>	Phil.
Smith, Harry Gray,	<i>Madison,</i>	M. C.
*Smith, Jennie Harrison,	<i>Mauston,</i>	Eng.
Smith, Winifred,	<i>Wheaton, Ill.,</i>	M. C.
Spofford, Franklin Vincent,	<i>Winona, Minn.,</i>	G. S.
Sprague, Marie Louise,	<i>Elkhorn,</i>	M. C.
Steuber, Frederick John,	<i>Prairie du Sac,</i>	Phil.
Stair, Henry C.,	<i>Brodhead,</i>	Phil.
Strong, Mary Louise,	<i>Dodgeville</i>	Eng.
Sutherland, Charles Henry,	<i>Janesville,</i>	G. S.
*Deceased.		

Sutherland, William Chester,	<i>Madison,</i>	G. S.
Sutherland, William James,	<i>Fairdale, Ill.,</i>	Phil.
Swain, Katharine Egerton,	<i>Milwaukee,</i>	A. C.
Swartz, George Willis,	<i>Arkansas,</i>	Phil.
Taylor, Henry Herman,	<i>Barron,</i>	Eng.
Tearse, Clarence Dudley,	<i>Winona, Minn.,</i>	Eng.
Thune, Emily Louise,	<i>Decorah, Ia.,</i>	Phil.
Titus, Winifred,	<i>Oshkosh,</i>	G. S.
Underwood, Enoch William,	<i>Baltimore, Md.,</i>	Eng.
Vallee, Francis Arthur,	<i>Racine,</i>	C. H.
Valentine, Anna De Riemer,	<i>Janesville,</i>	M. C.
Van Horn, Fred Milo,	<i>Madison,</i>	A. C.
Vea, Valborg V. Johnson,	<i>Stoughton,</i>	C. H.
Walter, Henry Lampert,	<i>Madison,</i>	G. S.
Warner, Fanny,	<i>Windsor,</i>	M. C.
Warner, Florence Maurine,	<i>Windsor,</i>	G. S.
Warriner, Helen Haskell,	<i>Portage,</i>	M. C.
Washburn, Robert Glendenning,	<i>Milwaukee,</i>	G. S.
Waters, Terese Frances,	<i>Fond du Lac,</i>	Phil.
Weber, Anna Katherine,	<i>Monroe,</i>	C. H.
Welsh, Eunice Wallace,	<i>Madison,</i>	M. C.
Whelan, Dutee Allen,	<i>Mondovi</i>	Eng.
White, Alfred Edward,	<i>Sparta,</i>	C. H.
Willett, Thomas,	<i>Madison,</i>	G. S.
Williams, Wirt Clay,	<i>Middleton,</i>	Phil.
Windén, Julius,	<i>Monroe,</i>	Phil.
Winter, Paul Gerhard,	<i>Madison,</i>	Eng.
Wolcott, Edson Ray,	<i>Sharon,</i>	G. S. (Phys.)
Wright, Paul Randall,	<i>Monroe,</i>	A. C.
Yankey, Charles,	<i>Juneau,</i>	Eng.
Zimmerman, Viola May,	<i>Milwaukee,</i>	Phil.

Sophomore Class.

Allen, Eric William,	<i>Milwaukee,</i>	A. C.
Astle, Cora Alice,	<i>Prairie du Sac,</i>	Eng.
Bacon, Elbridge,	<i>La Crosse,</i>	C. H.
Baer, Clarence Allen,	<i>Milwaukee,</i>	Eng.
Baldwin, Arthur Algernon,	<i>Madison,</i>	C. H.
Ball, Sydney Hobart,	<i>Oak Park, Ill.</i>	A. C.
Barber, William Harley,	<i>Black Earth,</i>	G. S.
Barney, Jessie Alice,	<i>Mayville,</i>	Eng.

Barney, John McHenry,	<i>West Bend,</i>	C. H.
Bartlett, Eliza Wheelock,	<i>Milwaukee,</i>	M. C.
Beebe, Claude Spencer,	<i>Milwaukee,</i>	G. S.
Berg, Joseph Nicolai,	<i>Madison,</i>	C. H.
Bergstrom, Willis Charles,	<i>Neenah,</i>	C. H.
Best, Charles Lorton,	<i>Freeport, Ill.,</i>	C. H.
Beule, Arthur Franz,	<i>Beaver Dam,</i>	G. S.
Blackburn, Arthur William,	<i>Madison,</i>	A. C.
Bostwick, Harriet M.,	<i>Janesville,</i>	Eng.
Bradley, Harry Ernest,	<i>Madison,</i>	A. C.
Brahany, Mary Eleanor,	<i>Madison,</i>	M. C.
Brayton, Abbie Louise,	<i>La Crosse,</i>	M. C.
Bredsteen, Joseph,	<i>Stoughton,</i>	Eng.
Bridge, Burton Hathaway,	<i>Monroe,</i>	M. C.
Bross, Agnes Marie,	<i>Chicago, Ill.,</i>	M. C.
Brownson Laura,	<i>Sharon,</i>	Eng.
Brunckhorst, Louis Arthur,	<i>Kewannee,</i>	Eng.
Buchanan, Herbert Daniel,	<i>Rio,</i>	C. H.
Buchholz, William David,	<i>Whitehall,</i>	Eng.
Buell, Kate M.,	<i>Sun Prairie,</i>	G. S.
Burke, Laurance Charles,	<i>Chicago, Ill.,</i>	C. H.
Carey, Mary,	<i>Wild Rose,</i>	M. C.
Carr, William James,	<i>Madison,</i>	C. H.
Carthew, Henry Edward,	<i>Lancaster,</i>	C. H.
Caulkins, Annie Knower,	<i>Milwaukee,</i>	G. S.
Cavanaugh, Abigail Emma,	<i>Shullsburg,</i>	Eng.
Collins, William Benjamin,	<i>Sheboygan,</i>	C. H.
Cross, Mary Helen,	<i>Madison,</i>	Eng.
Curtis, Dorothea Hughes,	<i>Madison,</i>	A. C.
Curtis, George Gregory,	<i>Merrill,</i>	Eng.
Davidson, Flora Nell,	<i>Madison,</i>	Eng.
Davis, Herbert Wallace,	<i>Camp Douglas,</i>	Eng.
Dietz, Charles Howard,	<i>Monroe,</i>	C. H.
Donnell, Will Lyle,	<i>Mattoon, Ill.,</i>	C. H.
Downs, Robert Hugh,	<i>Oshkosh,</i>	C. H.
Ehrlich, Charlotte,	<i>Berlin,</i>	Eng.
Ensminger, Leonard Austin,	<i>Crawfordsville, Ind.,</i>	C. H.
Evans, Caroline Whettan,	<i>Madison,</i>	G. S. (Math.)
Franc, Dorothy Helena,	<i>West Depere,</i>	M. C.
Fritsche, Gustav Armin,	<i>Milwaukee,</i>	A. C.
Gardner, Harry Irving,	<i>Grand Rapids,</i>	Eng.
Gifford, Byron Towne,	<i>Oconomowoc,</i>	Eng.

Goddard, Frederic Richardson,	<i>Decorah, Ia.,</i>	G. S.
Godfrey, James Dudley,	<i>Wauwatosa,</i>	Eng.
Graham, James Blain,	<i>Roberts,</i>	A. C.
Grandy, Adah Georgina,	<i>Sioux City, Ia.,</i>	M. C.
Groffman, George William,	<i>Berlin,</i>	Eng.
Haecker, Mary Mendota,	<i>Sun Prairie,</i>	Eng.
Hancock, Eugene Thomas,	<i>Tomah,</i>	G. S. (Geol.)
Hart, Henry Isaac,	<i>Wild Rose,</i>	Eng.
Harvey, Edward Joseph,	<i>Racine,</i>	G. S.
Hastie, Grace Reedal,	<i>Hartman,</i>	Eng.
Hektoen, Marie,	<i>Westby,</i>	M. C.
Hettman, Sadie Lavinia,	<i>Sparta,</i>	M. C.
Hogan, James Cook,	<i>La Crosse,</i>	A. C.
Hook, Fred Luther,	<i>S. Milwaukee,</i>	G. S.
Hoy, William Pierson,	<i>Woodstock, Ill.,</i>	C. H.
James, Blanche Ella,	<i>Eau Claire,</i>	A. C. (Math.)
Johnson, Evelyn Ottillia,	<i>La Crosse,</i>	M. C.
Kavanaugh, Katherine Blanche,	<i>Madison,</i>	Eng.
Ketchum, Florence Josephine,	<i>Madison,</i>	Eng.
Kinnear, Lewis Reuben,	<i>Portage,</i>	Eng.
Knoff, Robert Ernest,	<i>Janesville,</i>	Eng.
Kohler, Marie Christine,	<i>Sheboygan,</i>	Eng.
Kroehnke, Jessie Pamela,	<i>Thiensville,</i>	Eng.
Kuechenmeister, Florence Adele,	<i>West Bend,</i>	Eng.
Lea, Harry Richard,	<i>Waupaca,</i>	C. H.
Lea, William Francis,	<i>Waupaca,</i>	C. H.
Lewis, Paul Adin,	<i>Milwaukee,</i>	Eng.
Libby, Benjamin,	<i>Madison,</i>	C. H.
Luhman, Hugo Frank,	<i>Manitowoc,</i>	C. H.
Lyman, John Quinton,	<i>Kenosha,</i>	C. H.
McCullough, Frank Michael,	<i>Sturgeon Bay,</i>	G. S. (Math.)
McGowan, Fred C.,	<i>Eau Claire,</i>	Eng.
Mansfield, Flora Frances,	<i>Johnson Creek,</i>	G. S.
Maurer, Robert Adam,	<i>Sheboygan,</i>	C. H.
Meinert, Herman Timothy,	<i>Green Bay,</i>	M. C.
Morgan, James Carlos,	<i>Hartford,</i>	C. H.
Nash, James Bertram,	<i>Centralia,</i>	G. S.
Neilson, Allan Samuel,	<i>N. Milwaukee,</i>	Eng.
Nelson, Carl Emil,	<i>Racine,</i>	C. H.
Newman, Mark Humphrey,	<i>Madison,</i>	A. C.
Nicholas, Walter Alvin,	<i>Livingston,</i>	Eng.
Noelke, Augusta Elizabeth,	<i>La Crosse,</i>	Eng.

Nye, Evans McGregor,	<i>Lancaster,</i>	C. H.
Osborne, Harry Stephens,	<i>Darlington,</i>	C. H.
Pardee, Neely Eugene,	<i>Wausau,</i>	M. C.
Peterson, Harold Stuart,	<i>Milwaukee,</i>	A. C.
Pettibone, Mary Iuez,	<i>Fond du Lac,</i>	A. C.
Pfund, August Herman,	<i>Madison,</i>	G. S.
Plumb, Ralph Gordon,	<i>Manitowoc,</i>	C. H.
Powell, Daisy Dean,	<i>Argyle,</i>	Eng.
Priestly, Thomas Mortimer,	<i>Madison,</i>	C. H.
Ridlington, Daniel James,	<i>Dells Rapids, S. D.,</i>	A. C.
Ruhnke, Richard,	<i>Alyoma,</i>	G. S.
Sawyer, Harriet Josephine,	<i>Hartford,</i>	Eng.
Sawyer, Walter Percy,	<i>Waukesha,</i>	G. S.
Schoensigel, Fred Christian,	<i>Plymouth,</i>	Eng.
Schubring, Edward John B.,	<i>Sauk City,</i>	Eng.
Seiler, Charles Edwin,	<i>Alma,</i>	G. S.
Sherman, Leta,	<i>Milwaukee,</i>	A. C.
Sias, Nellie Bly,	<i>Sparta,</i>	M. C.
Skonnord, Olaf Norman,	<i>La Crosse,</i>	C. H.
Smith, Arthur Frank,	<i>Madison,</i>	G. S.
Smith, Ashbel V.,	<i>Waukegan, Ill.,</i>	Eng.
Smith, August,	<i>Berlin,</i>	Eng.
Smith, Julia Forster,	<i>Madison,</i>	A. C.
Stevens, John Charles,	<i>Milwaukee,</i>	A. C.
Stillman, Clara,	<i>Milwaukee,</i>	G. S.
Storms, Jeanette Boynton,	<i>Madison,</i>	Eng.
Stover, Paul,	<i>Milwaukee,</i>	A. C.
Sweet, Lucien Samuel,	<i>Madison,</i>	C. H.
Thomas, Alice Elizabeth,	<i>Waukesha,</i>	M. C.
Thompson, Charles Henry,	<i>Davenport, Ia.,</i>	A. C.
Tracy, Lynn Hickok,	<i>Madison,</i>	A. C.
Tracy, Percy Wheeler,	<i>Madison,</i>	G. S.
Verberkmoes, John Martin,	<i>Madison,</i>	G. S.
Vroman, William Phillip,	<i>Green Bay,</i>	M. C.
Warning, Edith Henrietta,	<i>Elkhorn,</i>	M. C.
Wehmhoff, Eugene John,	<i>Burlington,</i>	A. C.
Weirich, Paul Joseph,	<i>Monroe,</i>	G. S.
Werner, Fred William C., Jr.,	<i>Milwaukee,</i>	G. S.
White, Clarence Joel,	<i>Monroe,</i>	A. C.
Williams, Charles A.,	<i>Madison,</i>	C. H.
Wilson, Mary Lang,	<i>Burlington,</i>	G. S.
Wing, Florence Sherwood,	<i>La Crosse,</i>	M. C.

Wolf, Herman Emil,	<i>La Crosse,</i>	G. S.
Woy, John M.,	<i>Madison,</i>	C. H.
Wyssmann, Arthur Joseph,	<i>Manitowoc,</i>	C. H.

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Freshman Class.

Abbott, Maude Elinor,	<i>Madison,</i>	Eng.
Adair, Ralph Winston,	<i>Milton Junction,</i>	Eng.
Allen, Charles Chester,	<i>Kenosha,</i>	Eng.
Anderson, Peter Olson,	<i>Madison,</i>	G. S.
Armstrong, James Edwin,	<i>Rockford, Ill.,</i>	Eng.
Astle, Celia Minerva,	<i>Prairie du Sac,</i>	M. C.
Barkhausen, Clara Marie,	<i>Green Bay,</i>	Eng.
Barnes, Herbert Trumbull,	<i>Elkhorn,</i>	G. S.
Barr, James,	<i>Milwaukee,</i>	A. C.
Barry, Hamlet Joseph,	<i>Milwaukee,</i>	A. C.
Bascom, Lelia,	<i>Chicago, Ill.,</i>	Eng.
Baxter, James,	<i>Sioux City, Ia.,</i>	G. S.
Beebe, Dwight Eastman,	<i>Racine,</i>	C. H.
Bennethum, Roy Montelius,	<i>Freeport, Ill.,</i>	G. S.
Bergstrom, Lucius Seymour,	<i>Neenah,</i>	C. H.
Beye, William,	<i>Oak Park, Ill.,</i>	C. H.
Binzel, Paul Marie,	<i>Milwaukee,</i>	A. C.
Blake, Chauncey Ettheredge,	<i>Rockford, Ill.,</i>	Eng.
Bolender, Edna,	<i>Monroe,</i>	M. C.
Bready, James Ely,	<i>Dubuque, Ia.,</i>	A. C.
Brennan, John Vincent,	<i>Tomah,</i>	M. C.
Brindley, John Edwin,	<i>Boscobel,</i>	C. H.
Brinstad, Robin Emmanuel,	<i>La Crosse,</i>	G. S.
Brown, Rufus Choate, Jr.,	<i>Oshkosh,</i>	Eng.
Bryning, Pearl Grace,	<i>Madison,</i>	A. C.
Bucklin, Frank Winslow,	<i>Brodhead,</i>	Eng.
Buehler, Henry Arthur,	<i>Monroe,</i>	G. S.
Buell, Ella Clara,	<i>Sun Prairie,</i>	Eng.
Bunker, Arthur Stuart,	<i>Chicago, Ill.,</i>	A. C.
Button, Kittie Louise,	<i>Milton Junction,</i>	Eng.
Cady, Elsie Claire,	<i>Green Bay,</i>	C. H.
Cain, Elmer Ellsworth,	<i>Wauwatosa,</i>	M. C.
Campbell, William,	<i>Gurnee, Ill.,</i>	C. H.
Carpenter, Fred Hiltman,	<i>Evanston, Ill.,</i>	C. H.
Case, Agnes Embree,	<i>N. Greenfield,</i>	G. S.
Case, Wilhelmina Georgia,	<i>Prairie du Chien,</i>	A. C.

Castenholz, William Burtice,	<i>Indianapolis, Ind.,</i>	Eng.
Chamberlain, Alice Emily,	<i>Madison,</i>	Eng.
Clawson, Harvey,	<i>Monroe,</i>	A. C.
Clifford, Cecil Leslie,	<i>Madison,</i>	A. C.
Coe, Robert Kirkland,	<i>Whitewater,</i>	C. H.
Cole, Viola Melissa S.,	<i>Waterloo,</i>	Eng.
Condon, Elizabeth Agnes,	<i>Oregon,</i>	Eng.
Conway, Mayme,	<i>Elroy,</i>	Eng.
Cook, Harry Harold,	<i>Neenah,</i>	C. H.
Coombs, Millicent,	<i>Madison,</i>	G. S.
Coon, John Ward,	<i>Madison,</i>	Eng.
Cottrell, Bessie Etta,	<i>Spencer, Ia.,</i>	M. C.
Cowie, Harry James,	<i>W. Superior,</i>	C. H.
Craigo, Cathaleen Mae,	<i>Monroe,</i>	M. C.
Cronk, Victor Doughty,	<i>Louisville,</i>	C. H.
Cummings, Maude Elizabeth,	<i>Madison,</i>	G. S.
Curtis, Arthur Hale,	<i>Madison,</i>	G. S.,
Dahle, Otto Bjorn,	<i>Mt. Horeb,</i>	M. C.
Darby, Helen Louise,	<i>Morgan Park, Ill.,</i>	A. C.
Davis, Evan Griffith,	<i>Wales,</i>	A. C.
Davison, Agnes Viola,	<i>Sun Prairie,</i>	Eng.
Davlin, Thomas Francis,	<i>Berlin,</i>	Eng.
Dessinger, Mamie Esther,	<i>Freeport, Ill.,</i>	C. H.
Donkle, Lucius,	<i>Madison,</i>	G. S.
Donnelly, Esther,	<i>Milwaukee,</i>	C. H.
Driver, Sephus Earl,	<i>Darlington,</i>	Eng.
Du Four, Clarence John,	<i>Milwaukee,</i>	G. S.
Dunn, Elizabeth Regina,	<i>Madison,</i>	Eng.
Eiche, Adela,	<i>Marshfield,</i>	G. S.
Ernst, Adolfine,	<i>Watertown,</i>	Eng.
Esch, Ella Lydia,	<i>Sparta,</i>	M. C.
Fairbank, Alfred Frank,	<i>Ladoga,</i>	Eng.
Ferguson, Bessie Carolyn,	<i>Madison,</i>	Eng.
Ferry, Harold Edgar,	<i>Oconomowoc,</i>	Eng.
Fish, Herbert Clay,	<i>Moline, Ill.,</i>	C. H.
Fisher, Charlotte Ilsley,	<i>Milwaukee,</i>	G. S.
Fortney, Gerhard O.,	<i>Viroqua,</i>	M. C.
Foster, Paul Clark,	<i>Silver Lake,</i>	G. S.
Frawley, Thomas Francis, Jr.,	<i>Eau Claire,</i>	M. C.
Frick, Orlando H.,	<i>Antigo,</i>	C. H.
Fulton, Blanche,	<i>Hudson,</i>	M. C.
Galusha, Nellie,	<i>Monroe,</i>	M. C.

Gamble, Alice Janet,	<i>Yankton, S. D.</i>	C. H.
Gamble, Lillian Margaret,	<i>Yankton, S. D.</i>	C. H.
Gapen, Anna Mercedes,	<i>Madison,</i>	C. H.
Gapen, Flora,	<i>Madison,</i>	G. S.
Gilbert, Iva Lulu,	<i>Madison,</i>	Eng.
Glasier, Emma Belle,	<i>Bloomington,</i>	A. C.
Grams, Carl,	<i>Beaver Dam,</i>	G. S.
Grebel, Charles John,	<i>Milwaukee,</i>	A. C.
Grotophorst, Alfred,	<i>Prairie du Sac,</i>	Eng.
Grover, Dana Irving,	<i>Milwaukee,</i>	C. H.
Gust, George Lewis,	<i>Baraboo,</i>	Eng.
Habich, Maie,	<i>Madison,</i>	Eng.
Haight, Robert Wilbur,	<i>Waukesha,</i>	C. H.
Harney, Leon Lewis,	<i>Schofield,</i>	C. H.
Hasse, August Frederick,	<i>Wauwatosa,</i>	M. C.
Hawley, Ada Lōvisa,	<i>Madison,</i>	G. S.
Hayden, Grace Mae,	<i>Sun Prairie,</i>	Eng.
Hayes, Genevieve Miriam,	<i>Janesville,</i>	C. H.
Hayner, Carolyn Virginia,	<i>Madison,</i>	A. C.
Heaton, Ruth,	<i>Reedsburg,</i>	M. C.
Hecht, Grace Aguilar,	<i>Milwaukee,</i>	C. H.
Henry, John Rex,	<i>Freemont, Neb.,</i>	C. H.
Hessmann, May Lena,	<i>Madison,</i>	Eng.
Hinkley, Marie Gardiner,	<i>Milwaukee,</i>	G. S.
Holah, Carrie Gestina,	<i>Baraboo,</i>	M. C.
Holland, Julia Christine,	<i>Moscow,</i>	Eng.
Holland, Lillian Solvei,	<i>Moscow,</i>	Eng.
Hooley, Edna Lydston,	<i>Wauwatosa,</i>	C. H.
Hopkins, Walter Sawyer,	<i>Leeds,</i>	Eng.
Howard, Earle Clarke,	<i>Sparta,</i>	G. S.
Huebner, Solomon,	<i>Manitowoc,</i>	Eng.
Hughes, Harriet Louise,	<i>Chicago, Ill.,</i>	C. H.
Humphrey, Mary Martin,	<i>Bloomington,</i>	A. C.
Hutson, Roy James.	<i>Edgerton,</i>	Eng.
Inbusch, Arthur Phillip H.,	<i>Milwaukee,</i>	C. H.
Janes, Harry Lorenzo,	<i>Racine,</i>	C. H.
Johnson, Myron Reed,	<i>Sheridan,</i>	Eng.
Jones, Theodore Thomas,	<i>Manitowoc,</i>	Eng.
Kemp, John Earle,	<i>Sparta,</i>	Eng.
Kennedy, Margaret Julia,	<i>Madison,</i>	Eng.
Kennedy, Mida Louise,	<i>Madison,</i>	Eng.
Kirch, Nicholas,	<i>Mazomanie,</i>	Eng.

Knauf, Lorine Anna,	<i>Chilton,</i>	M. C.
Knobel, Fred Henry,	<i>Edgerton,</i>	G. S.
Krape, Bessie Miriam,	<i>Freeport, Ill.,</i>	A. C.
Kratz, Bessie Mae,	<i>Sioux City, Ia.,</i>	C. H.
Krumrey, Robert Garfield,	<i>Plymouth,</i>	Eng.
Lachmund, Robert,	<i>Sauk City,</i>	Eng.
Lamberson, Laura Blanche,	<i>Richland Center,</i>	M. C.
Lamberson, Lelia Maude,	<i>Richland Center,</i>	Eng.
Lee, William Arthur,	<i>Madison,</i>	A. C.
Leihy, Edna Marie,	<i>Bayfield,</i>	M. C.
Leiser, Fred Oscar,	<i>Baraboo,</i>	Eng.
Lloyd, Ada Crang,	<i>Chicago, Ill.,</i>	Eng.
Lohr, Lewis George,	<i>Milwaukee,</i>	C. H.
Long, Charles Edwin,	<i>Davenport, Ia.,</i>	G. S.
Lennon, Hawley Daniel,	<i>Decorah, Ia.,</i>	C. H.
Lounsbury, Benjamin Franklin,	<i>Pipersville,</i>	Eng.
Ludlow, Charles Arabut,	<i>Monroe,</i>	A. C.
Ludlow, May,	<i>Monroe,</i>	M. C.
McClure, Joseph Charles,	<i>Beaver Dam,</i>	Eng.
McCue, Nora Bryant,	<i>Madison,</i>	C. H.
McFarland, James Garfield,	<i>Dubuque, Ia.,</i>	A. C.
McMahon, Mamie Karnes,	<i>Baraboo,</i>	M. C.
Mason, Marquis Edgar,	<i>Aurora, Ill.,</i>	G. S.
Meinhardt, Leonore Agnes,	<i>Burlington,</i>	Eng.
Menzel, Walter Reginald,	<i>Wausau,</i>	C. H.
Merrill, Agnes,	<i>Ashland,</i>	A. C.
Meyer, Ernst Christopher,	<i>Cedarburg,</i>	G. S.
Miller, John Calkins,	<i>Marinette,</i>	Eng.
Moffatt, William Francis,	<i>Davenport, Ia.,</i>	A. C.
Moldstad, Nelly Catherine,	<i>De Forest,</i>	Eng.
Moore, William James,	<i>Milton Junction,</i>	Eng.
Moorhouse, Edward Percy,	<i>Springfield,</i>	Eng.
Morrison, Bessie Lorraine,	<i>Dixon, Ill.,</i>	Eng.
Murdock, Harry Dale,	<i>Brodhead,</i>	G. S.
Nash, Lawrence Eugene,	<i>Centralia,</i>	G. S.
Nelson, Selma Josephine,	<i>Madison,</i>	M. C.
Nevins, John Wilson,	<i>Burlington, Ia.,</i>	C. H.
Newton, Carl A.,	<i>Sparta,</i>	G. S.
Niles, Sydney,	<i>Oak Park, Ill.,</i>	Eng.
Norton, Mabel Harriet,	<i>Pasadena, Cal.,</i>	M. C.
Olbrich, Michael Balthasar,	<i>Lawrence, Ill.,</i>	Eng.
O'Meara, John Albert,	<i>West Bend,</i>	Eng.

Paddock, Carrie Rosalind,	<i>Berlin,</i>	Eng.
Paetow, Louis John,	<i>Milwaukee,</i>	G. S.
Palmer, Bess Gail,	<i>Sparta,</i>	M. C.
Parker, Willard Giles,	<i>Sharon,</i>	Eng.
Parsons, John Burnham,	<i>Hebron,</i>	C. H.
Patrick, John Bartow,	<i>Oak Park, Ill.,</i>	A. C.
Peck, Helen Lucile,	<i>Fond du Lac,</i>	M. C.
Peckham, Mary Gifford,	<i>Milwaukee,</i>	Eng.
Perry, Minnie,	<i>Algoma,</i>	Eng.
Pesta, Rose Alice,	<i>Milwaukee,</i>	Eng.
Pick, Andrew John,	<i>West Bend,</i>	G. S.
Pick, Carl Edwin,	<i>West Bend,</i>	Eng.
Pickford, Merle Sears,	<i>Madison,</i>	Eng.
Pickford, Theo Beatrice,	<i>Madison,</i>	Eng.
Piper, Howard David,	<i>Madison,</i>	Eng.
Pohland, John Albert E.,	<i>Algoma,</i>	Eng.
Powers, John Francis,	<i>Mayhew,</i>	Eng.
Ramsey, Florence Harriet,	<i>Reedsburg,</i>	M. C.
Randolph, Mabel,	<i>St. Louis, Mo.,</i>	A. C.
Ranum, Blanche Hilma,	<i>La Crosse,</i>	G. S.
Rehberg, Frederic Herman,	<i>Brodhead,</i>	Eng.
Renwick, Olive Lucie,	<i>Kirkland, Ill.,</i>	C. H.
Roddis, Francis Mary,	<i>Marshfield,</i>	G. S.
Rosenheimer, Lehman Peter,	<i>Kewaskum,</i>	Eng.
Ross, Josephine,	<i>Milwaukee,</i>	M. C.
Runner, Olive Grace,	<i>Freeport, Ill.,</i>	C. H.
Ryan, William,	<i>Prairie du Sac,</i>	Eng.
St. Sure, Frank Adolph,	<i>Sheboygan,</i>	G. S.
Sage, Jeanette Limbert,	<i>Delavan,</i>	C. H.
Sage, Laura Elizabeth,	<i>Delavan,</i>	C. H.
Salisbury, Winifred,	<i>Oregon,</i>	Eng.
Sanborn, Katharine Wentworth,	<i>Madison,</i>	A. C.
Saunders, Arthur Bernard,	<i>Milton,</i>	G. S.
Sauthoff, Harry,	<i>Madison,</i>	A. C.
Scholz, Richard Frederick,	<i>Milwaukee,</i>	A. C.
Schorer, Edwin Henry,	<i>Plymouth,</i>	G. S.
Schroeder, Percy Edward,	<i>Racine,</i>	G. S.
Schule, Frederick William, Jr.,	<i>Chicago, Ill.,</i>	G. S.
Scofield, Jessie Ethna,	<i>Janesville,</i>	G. S.
Schwab, Edward Charles,	<i>Milwaukee,</i>	G. S.
Seeber, Sarah Jennie,	<i>Watertown,</i>	M. C.
Shaw, Florence Madeline,	<i>Sioux City, Ia.,</i>	A. C.

Sherman, Helen,	<i>Milwaukee,</i>	G. S.
Sheriil, Jennie Bentley,	<i>Belvidere, Ill.,</i>	C. H.
Shimmins, Zella Mary,	<i>Delavan,</i>	G. S.
Simonds, Charlotte Mayo,	<i>Hartland,</i>	G. S.
Slightam, Ida Elizabeth,	<i>Prairie du Chien,</i>	Eng.
Smith, Morton Weir,	<i>Waupun,</i>	Eng.
Smith, William Edward,	<i>Madison,</i>	C. H.
Spence, Florence Mitchell,	<i>Somers,</i>	C. H.
Spooner, Philip Loring,	<i>Madison,</i>	A. C.
Stark, Norma Millie,	<i>Davenport, Ia.,</i>	Eng.
Starks, Sanford Putnam,	<i>Madison,</i>	C. H.
Stedman, Maude Frances,	<i>Berlin,</i>	Eng.
Steere, Glenn S.,	<i>Plymouth,</i>	G. S.
Stephenson, Maud Martha,	<i>Madison,</i>	M. C.
Stevens, Edith Genevieve,	<i>Madison,</i>	Eng.
Stewart, Dugald Atherton,	<i>Winona, Minn.,</i>	A. C.
Stewart, Mabel Irene,	<i>Mason City, Ia.,</i>	Eng.
Stinehart, Charles Emerson,	<i>Mason City, Ia.,</i>	Eng.
Stockman, Ruth Chapin,	<i>Mason City, Ia.,</i>	A. C.
Stolte, Freda Dorothea,	<i>Reedsburg,</i>	M. C.
Strehlow, Max Hugo R.,	<i>De Forest,</i>	C. H.
Stucki, Anna,	<i>Milwaukee,</i>	G. S.
Sutherland, Frederic Ellsworth,	<i>Janesville,</i>	G. S.
Swain, Mary Brayton,	<i>Milwaukee,</i>	A. C.
Swoboda, Frank George,	<i>Troy,</i>	G. S.
Taylor, Frank Bashford,	<i>Madison,</i>	G. S.
Thompson, Carrie Edith,	<i>Whitewood, S. D.,</i>	M. C.
Thompson, Helen Gladys,	<i>Eau Claire,</i>	G. S.
Ticknor, Elizabeth Goffe,	<i>Madison,</i>	A. C.
Tiffany, William Edward,	<i>Plainfield,</i>	Eng.
Tormey, Ella Frances,	<i>Madison,</i>	M. C.
Uihlein, Arthur,	<i>Milwaukee,</i>	C. H.
Van Velzer, Clara Johnson,,	<i>Madison,</i>	M. C.
Vincent, Ethel Violet,	<i>Windsor,</i>	G. S.
Vinson, George Bryant,	<i>Milwaukee,</i>	M. C.
Vogel, Frederick August,	<i>Milwaukee,</i>	C. H.
Waite, Willis Willard,	<i>Brooklyn,</i>	G. S.
Wedge, Fred Rhinaldo,	<i>Rhinelande,</i>	Eng.
Welsh, Stanley Carpenter,	<i>Madison,</i>	G. S.
Wentworth, Daisybelle,	<i>Milwaukee,</i>	Eng.
Weston, Lou Evelyn,	<i>Winona, Minn.,</i>	Eng.
White, Daisy Paota,	<i>Chicago, Ill.,</i>	Eng.

Williams, James Arthur,	<i>Council Bluffs, Ia.</i>	C. H.
Williams, Leroy James,	<i>Viroqua,</i>	M. C.
Winkler, Henry Overbeck,	<i>Milwaukee,</i>	A. C.
Witwen, Emma Susan,	<i>Baraboo,</i>	M. C.
Wolfenson, Louis Bernard,	<i>Madison,</i>	A. C.
Woodruff, Ralph Hiram,	<i>Polo, Ill.,</i>	C. H.
Wright, Mary,	<i>Petersburg, Ill.,</i>	C. H.
Youngs, Frank Walter,	<i>Algoma,</i>	Eng.
Zimmerman, Clarence Irving,	<i>Milwaukee,</i>	G. S.
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Special Students.

Bach, Maud Erma,	<i>Kewaunee,</i>	Eng.
Beebe, Alice May,	<i>Sparta,</i>	M. C.
Blood, Henrietta Ada,	<i>Madison,</i>	M. C.
Boehm, Paul Waldemar L.,	<i>Wausau,</i>	Eng.
Casson, Henry, Jr.,	<i>Madison,</i>	C. H.
Chandler, Zach Anson,	<i>Oregon,</i>	G. S.
Chase, Ransom Jay,	<i>Sioux City, Ia.,</i>	G. S.
Clark, Jean Ferris,	<i>Berlin,</i>	Eng.
Cleary, Michael Joseph,	<i>Blanchardsville,</i>	Eng.
Cox, Grace Forrist,	<i>Milwaukee,</i>	G. S.
Daggett, Philip,	<i>Ottumwa, Ia.,</i>	G. S.
Dahl, Gerhard Melvin,	<i>Madison,</i>	Eng.
Dale, William Henry,	<i>Iola,</i>	Eng.
Desmond, Thomas Aquinas,	<i>Milwaukee,</i>	Eng.
Dickinson, William Frederic,	<i>Rockford, Ill.,</i>	Eng.
Dye, Daisy,	<i>Madison,</i>	Eng.
Edwards, William McEwen,	<i>Mauston,</i>	G. S.
Ellis, Ard Hoyt,	<i>Vinton, Ia.,</i>	Eng.
Enge, John Jacob,	<i>Eau Claire,</i>	Eng.
Estes, Elsie Viola,	<i>Sioux City, Ia.,</i>	Eng.
Fernekes, Gustave,	<i>Milwaukee,</i>	G. S.
Fuller, Marian Holcomb,	<i>Meadville, Pa.,</i>	C. H.
Godfrey, Elmer Ellsworth,	<i>Milton,</i>	G. S.
Gray, Walter Kempster,	<i>Milwaukee,</i>	M. C.
Hendrickson, Carl Siegfried,	<i>Albion,</i>	G. S.
Higgins, Samuel George,	<i>Rhineland,</i>	G. S.
Horton, Angelo Burgess,	<i>Oregon,</i>	Eng.
Houser, Ethel Isabel,	<i>Mondovi,</i>	Eng.
Hunter, Charles Dana,	<i>Merrill,</i>	Eng.
Hyde, Robert Stevens,	<i>La Crosse,</i>	Eng.
Hyman, Frank Sylvester,	<i>Oak Park, Ill.,</i>	C. H.

Jackson, Joseph William,	<i>Madison,</i>	C. H.
Jacobsen, Anna,	<i>Stoughton,</i>	Eng.
Karstens, Minnie,	<i>Madison,</i>	Eng.
Keenan, Harry Anthony,	<i>Oregon,</i>	G. S.
Kirwan, Charles,	<i>Manitowoc,</i>	Eng.
Landers, John Douglass,	<i>Merrill,</i>	Eng.
Langley, Ina Virginia,	<i>Merrill,</i>	Eng.
Lynch, Matthew John,	<i>Madison,</i>	G. S.
McDonald, Alexander Vaughn,	<i>Fond du Lac,</i>	G. S.
McGregor, Elizabeth Bowman,	<i>Platteville,</i>	A. C.
McKinnon, Donald James,	<i>Eau Claire,</i>	Eng.
McNish, Ralph Benjamin,	<i>Madison,</i>	C. H.
Macartney, Clarence Edward,	<i>Madison,</i>	A. C.
Malloy, Kathryn Gertrude,	<i>Fond du Lac,</i>	Eng.
Markham, George Francis,	<i>Milwaukee,</i>	M. C.
Mathér, Israel,	<i>Chicago, Ill.,</i>	Eng.
Mauermann, Julius Ferdinand,	<i>Brodhead,</i>	G. S.
Mills, Lewis Welling,	<i>Madison,</i>	C. H.
Mumford, Eugene Bishop,	<i>New Harmony, Ind.,</i>	G. S.
Mutch, James William,	<i>Elroy,</i>	G. S.
Nelson, Florence Eugenia V.,	<i>Madison,</i>	C. H.
Nelson, Nels Bastian,	<i>Eau Claire,</i>	Eng.
Nohelty, Patrick,	<i>Lake Geneva,</i>	Eng.
North, Charles Raymond,	<i>Onalaska,</i>	Eng.
Ogilvie, Jenny,	<i>Madison,</i>	Eng.
Oscar, Albert Stephen,	<i>Washburn,</i>	Eng.
Perry, Clara Marie,	<i>Algoma,</i>	Eng.
Petzke, Edward Ernest,	<i>Madison,</i>	M. C.
Phipps, Stephen Carpenter,	<i>Hudson,</i>	A. C.
Ranseen, Carl Matthew,	<i>Chicago, Ill.,</i>	Eng.
Regan, Katherine Patricia,	<i>Madison,</i>	Eng.
Reinhard, Hans August,	<i>Milwaukee,</i>	Eng.
Reynolds, Edward John,	<i>Madison,</i>	Eng.
Rhodes, Alfred John,	<i>Galesville,</i>	C. H.
Richards, Lillian Ethel,	<i>Lake Geneva,</i>	Eng.
Richards, Stanley Harold,	<i>Woodstock, Ill.,</i>	C. H.
Ringle, Oscar Louis,	<i>Wausau,</i>	Eng.
Rogers, Victor Eugene,	<i>Madison,</i>	Eng.
Rosenheimer, Marie Eliza,	<i>Schlesingerville,</i>	Eng.
Silsby, Nellie Elizabeth,	<i>Madison,</i>	Eng.
Smith, Goldwin Howard,	<i>Madison,</i>	Eng.
Smith, Warren Du Pré,	<i>Madison,</i>	G. S.

Smith, Winifred Mary,	<i>Sturgeon Bay,</i>	Eng.
Sniveley, Helen Adams,	<i>Lincoln, Neb.,</i>	Eng.
Snow, Edwin Augustus,	<i>West Superior,</i>	C. H.
Stetson, Dudley Donnelly,	<i>Milwaukee,</i>	G. S.
Stone, Belva Gladys,	<i>Bloomington,</i>	A. C.
Suhr, Blanche Beatrice,	<i>Madison,</i>	G. S.
Thomas, Edward Smith,	<i>Polo, Ill.,</i>	Eng.
Vilas, Katherine Porter,	<i>Madison,</i>	M. C.
Virgin, Ethel Linn,	<i>Platteville,</i>	Eng.
Watson, John Charles,	<i>Livingston,</i>	Eng.
Webster, Gertrude,	<i>Whitewater,</i>	A. C.
Whare, George Bartholomew,	<i>Madison,</i>	G. S.
Wilcox, Frances May,	<i>Rockford, Ill.,</i>	C. H.
Williams, Jason P.,	<i>Sparta,</i>	C. H.
Winkenwerder, Hugo August,	<i>Watertown,</i>	G. S.
Woodard, Daniel Wallace,	<i>Clinton Junction,</i>	Eng.
Woollen, Herbert Milton,	<i>Indianapolis, Ind.,</i>	G. S.
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Adult Special Students.

Anderson, Mina Aletha,	<i>Argyle.</i>
Austin, Arthur John,	<i>Hazel Green.</i>
Barton, Ella Andrea,	<i>Mt. Vernon.</i>
Bates, Walter Eugene,	<i>Retreat.</i>
Berg, Martin John,	<i>Madison.</i>
Blake, Emmons Reed,	<i>Port Washington.</i>
Bold, Mabel Dixon,	<i>Madison.</i>
Breitenfeld, Arthur Edmund,	<i>Madison.</i>
Cronkhite, Nettie Laura,	<i>Hastings, Neb.</i>
Cunningham, Delia Katharine,	<i>Madison.</i>
Davis, Robert Moses,	<i>Aspen, Colo.</i>
Denniston, Florence Kate,	<i>Madison.</i>
Esterly, Heloise Gai,	<i>Dodgeville.</i>
Esterly, Henry Minor,	<i>Madison.</i>
Faulkes, Florence Felicia,	<i>Madison.</i>
Ford, Edna Hillver,	<i>Madison.</i>
Gannon, Thomas Melvin,	<i>Cedarburg.</i>
Gilbert, Edna Marion,	<i>Madison.</i>
Gilbertson, Nellie Matilda,	<i>St. Ansgar, Ia.</i>
Gohlke, George Henry,	<i>Madison.</i>
Gray, Eunice Thompson,	<i>Darlington.</i>
Harrigan, Frank Elwood,	<i>Madison.</i>

Harris, Sally Prime,	<i>Minneapolis, Minn.</i>
Hart, Frances Gertrude,	<i>Madison.</i>
Henkes, David Albert,	<i>Madison.</i>
Herfurth, Elizabeth Marie,	<i>Madison.</i>
Hewitt, Harry Roland,	<i>Marinette.</i>
Johnson, Fred, Jr.,	<i>Madison.</i>
Johnson, Jesse Worthington,	<i>Sterling, Ill.</i>
Ketcham, Preston Harry,	<i>Madison.</i>
Kittleson, Isaac Milo,	<i>Stewart.</i>
Kittleson, Ole Andrew,	<i>Perry.</i>
Kundert, John Emil,	<i>Madison.</i>
Kunze, Linnah Laura,	<i>Garden Prairie.</i>
McMillan, John Walter,	<i>Milwaukee.</i>
Mathias, Mary Constance,	<i>Madison.</i>
Merrill, Lillie McDonald,	<i>Burlington.</i>
Morris, Thomas Sherman,	<i>Madison.</i>
Parker, Marion Sylvanus,	<i>Ft. Atkinson.</i>
Pierick, Herman,	<i>Dry Bone.</i>
Reed, Evan Laforest,	<i>Oregon, Ill.</i>
Richardson, Robert Emmons,	<i>Burlington.</i>
Rice, Hildor Petrehn,	<i>Madison.</i>
Rohde, Hugo William,	<i>Milwaukee.</i>
Sauthoff, Harriett Rosetta,	<i>Madison.</i>
Sharpe, Guy Arnold,	<i>Johnsonburg, N. Y.</i>
Smyth, Herman Augustine,	<i>Stuart, Ia.</i>
Speer, Mabel Phoebe,	<i>Chicago, Ill.</i>
Swenson, Katherine Trevett,	<i>Champaign, Ill.</i>
Thompson, Verne Roy,	<i>Madison.</i>
Wald, Emilie Rose,	<i>Madison.</i>
Whitman, Irene Lucinda,	<i>Appleton.</i>
Williams, John,	<i>Sun Prairie.</i>
Williamson, Richard,	<i>Madison.</i>

COLLEGE OF MECHANICS AND ENGINEERING.

-54

Senior Class.

Austin, Wilbur Azro,	<i>Bloomington,</i>	M. E.
Barr, John Martin,	<i>Milwaukee,</i>	M. E.
Buckley, Walter John,	<i>Lake Mills,</i>	E. E.
Connor, Samuel Powers,	<i>Clinton, Ia.,</i>	C. E.
Freschl, Edward,	<i>Milwaukee,</i>	M. E.
Hambuechen, Carl,	<i>Milwaukee,</i>	E. E.
Hanson, Henry Olaus,	<i>Eau Claire,</i>	E. E.

Hogan, John Joseph,	<i>Chippewa Falls,</i>	E. E.
Keller, Carl A.,	<i>Chilton,</i>	E. E.
Knowles, James Henry,	<i>Madison,</i>	C. E.
Lippert, Arthur Bernard,	<i>Milwaukee,</i>	E. E.
Logemann, Richard Thomas,	<i>Milwaukee,</i>	C. E.
McConville, Curran Collins,	<i>La Crosse,</i>	M. E.
Mason, Charles Thomas,	<i>Fond du Lac,</i>	M. E.
Nee, George Thomas,	<i>Ft. Atkinson,</i>	E. E.
Nommensen, Richard Arthur,	<i>Sheboygan,</i>	C. E.
Olsen, Martin C.,	<i>Eau Claire,</i>	E. E.
Olson, Louis Walter,	<i>Manitowoc,</i>	E. E.
Reynolds, William Everett,	<i>Mineral Point,</i>	E. E.
Richards, William Allen,	<i>Madison,</i>	M. E.
Scheiber, Arthur Valentine,	<i>Milwaukee,</i>	E. E.
Schroeder, Frederick Albert,	<i>Milwaukee,</i>	E. E.
Shuster, John Wesley,	<i>Florence, S. D.,</i>	E. E.
Stewart, Ralph William,	<i>Richland Center,</i>	C. E.

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Junior Class.

Ahara, Theodore Henry,	<i>Evansville,</i>	M. E.
Barnes, Charles Ballou,	<i>Denrock, Ill.,</i>	M. E.
Baus, Richard Edward,	<i>Madison,</i>	M. E.
Bean, Irving McCullough,	<i>Milwaukee,</i>	M. E.
Buttles, Ben Elijah,	<i>Madison,</i>	E. E.
Campbell, Mildred Wadsworth,	<i>Madison,</i>	C. E.
Cannon, Willis West,	<i>Green Bay,</i>	E. E.
Cook, Thomas Russell,	<i>Oshkosh,</i>	M. E.
Dixon, John Edward,	<i>Milwaukee,</i>	M. E.
Emerson, Fred Merrill,	<i>Milwaukee,</i>	C. E.
Fowler, Myron Marshall,	<i>Wauwatosa,</i>	M. E.
Granke, Leo Ernest,	<i>La Crosse,</i>	C. E.
Harvey, John Le Roy,	<i>Mondovi,</i>	M. E.
Heald, Eugene Hamilton,	<i>Oak Park, Ill.,</i>	C. E.
Hedke, Charles Richard,	<i>Racine,</i>	C. E.
Hegg, John Richard,	<i>Cumberland,</i>	C. E.
Hoyt, Warren Albert,	<i>Madison,</i>	C. E.
Humphrey, Clifford Wane,	<i>Waterloo,</i>	E. E.
Icke, John Frederick,	<i>Marshfield,</i>	C. E.
Lacey, Frank Herbert,	<i>Chamberlain, S. D.,</i>	E. E.
Lea, John McKenzie,	<i>Waupaca,</i>	E. E.
Lindem, Olaf James,	<i>Marinette,</i>	C. E.
McArthur, Arthur Royal,	<i>Johnstown,</i>	M. E.

Marvin, Arba B., Jr.,	Oregon,	E. E.
Merrick, Eldridge Gerry,	Danbury, Conn.,	E. E.
Minch, Walter Bernard,	Madison,	M. E.
Moore, Lewis Eugene,	Chicago, Ill.,	M. E.
Nelson, Clarence Lotario,	Racine,	C. E.
Older, Clifford,	Portage,	C. E.
Parsons, Walter Jay,	Chicago, Ill.,	C. E.
Radtke, Albert Augustus,	Madison,	E. E.
Rhine, Charles Augustus,	Milwaukee,	E. E.
Rollman, Alfred,	Chilton,	E. E.
Sands, Edward Emmet,	Sparta,	C. E.
Schmitt, Frederick Emil,	Green Bay,	C. E.
Seaman, Harold,	Milwaukee,	E. E.
Smith, Sidney Theodore,	Sturgeon Bay,	C. E.
Stone, Melvin Bailey,	Madison,	C. E.
Wasmandorff, Otto Francis,	Madison,	C. E.
Weed, Louis Burgess,	Madison,	C. E.
Whomes, Harry Richards,	Baraboo,	M. E.
Williams, Lynn Alfred,	Milwaukee,	M. E.
Williams, Will Thomas,	Menasha,	C. E.
Williams, William H.,	Oshkosh,	C. E.
Williamson, Edward Lucius,	Janesville,	C. E.
Wipfler, Robert Edwin,	Detroit, Mich.,	C. E.
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Sophomore Class.

Abbott, Clarence Eugene,	Madison,	M. E.
Atkins, Hubbard Chandle",	Milwaukee,	M. E.
Bachelor, Clare Herbert,	Madison,	M. E.
Bachelor, Frank Jerome,	Madison,	C. E.
Barkhausen, Louis Henry,	Green Bay,	M. E.
Berry, Claude,	Madison,	C. E.
Brobst, John Everett,	Mondovi,	E. E.
Buerstatte, Frederick William,	Manitowoc,	M. E.
Bunker, George Tracy,	Woodstock, Ill.,	M. E.
Burdick, William Courteney,	Milwaukee,	C. E.
Carter, Archy Burt,	Madison,	C. E.
Colbert, Lawrence Clarence,	Whitewater,	M. E.
Collins, Charles Graham,	Madison,	C. E.
Countryman, Merton Alvin,	Rochelle, Ill.,	C. E.
Dean, Charles Lyman,	Seymour,	M. E.
Dorschel, Oscar Lucus,	Chilton,	E. E.
Ferris, Harold Gano,	Carthage, Ill.,	M. E.

Frederickson, Carl Gothhard,	<i>Madison,</i>	C. E.
Fricke, August Charles,	<i>Milwaukee,</i>	M. E.
Fugitt, Carroll Townsend,	<i>Washington, D. C.,</i>	C. E.
Hartmann, Rudolph,	<i>Milwaukee,</i>	C. E.
Haskin, Edwin Easter,	<i>Milwaukee,</i>	M. E.
Hawn, Russell John,	<i>Stevens Point,</i>	C. E.
Hirschberg, Walter Paul,	<i>Milwaukee,</i>	C. E.
Hopkins, Roy Edward,	<i>Edgerton,</i>	C. E.
Hurd, John Thomas,	<i>Oregon,</i>	C. E.
Hurd, Nathaniel Leslie,	<i>Chippewa Falls,</i>	M. E.
Jones, Frank William,	<i>Milwaukee,</i>	E. E.
King, Arthur Charles,	<i>Chicago, Ill.,</i>	M. E.
Larson, Albert Frederick,	<i>Sioux Falls, S. D.,</i>	M. E.
Legg, Ernest Friend,	<i>Wausau,</i>	E. E.
Leahy, John Hamilton,	<i>Madison,</i>	E. E.
Little, Frederick Arthur,	<i>Fond du Lac,</i>	M. E.
Lorch, John August,	<i>Madison,</i>	C. E.
Meyers, Alvin,	<i>Verona,</i>	E. E.
Nicholaus, Albert Adam,	<i>Beaver Dam,</i>	E. E.
Palmer, Ray,	<i>Madison,</i>	E. E.
Peele, Hereward John,	<i>Madison,</i>	E. E.
Plumb, Hylon Theron,	<i>Milton,</i>	E. E.
Salsich, Le Roy,	<i>Hartland,</i>	C. E.
Sanborn, Roy Asa,	<i>Janesville,</i>	E. E.
Savage, Edwin Forest,	<i>Madison,</i>	M. E.
Severson, Harry Ashton,	<i>Milwaukee,</i>	C. E.
Smith, James Elmo,	<i>Sharon,</i>	C. E.
Townsend, Hubert Isaac,	<i>Poynette,</i>	E. E.
Vautrot, Frank Jules,	<i>Durand,</i>	M. E.
Vea, Fritchjof Johnson,	<i>Stoughton,</i>	M. E.
Washburn, Frank Edwin,	<i>Sturgeon Bay,</i>	C. E.
Watson, Charles Harry,	<i>Milwaukee,</i>	M. E.
Watson, James Webster,	<i>La Crosse,</i>	E. E.
Williams, Lester Denison,	<i>Fox Lake,</i>	C. E.
Wood, Henry Harrison,	<i>Stebbinsville,</i>	M. E.
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Freshman Class.

Adams, Bertram Francis,	<i>Chicago, Ill.,</i>	M. E.
Anderson, Bertie Samuel,	<i>Hartford,</i>	M. E.
Anderson, Gustave,	<i>West Salem,</i>	M. E.
Baer, Edward Sherman,	<i>Appleton,</i>	M. E.
Balding, Harry Alfred,	<i>Milwaukee,</i>	E. E.

Ballschmider, Arno Louis,	<i>Sheboygan Falls,</i>	E. E.
Balsley, Eugene Albert,	<i>Elkhorn,</i>	C. E.
Benson, Gillett Amos,	<i>Black River Falls,</i>	C. E.
Berg, William Carl,	<i>Ft. Atkinson,</i>	C. E.
Biddison, Herbert William,	<i>Chicago, Ill.,</i>	M. E.
Boldenweck, Felix William,	<i>Chicago, Ill.,</i>	M. E.
Brown, Norman Hempsted,	<i>Gurnee, Ill.,</i>	M. E.
Bump, Milan Raymond,	<i>Spokane, Wash.,</i>	E. E.
Campbell, Willard van Brunt,	<i>Horicon,</i>	E. E.
Cole, Charles Melville, Jr.,	<i>Appleton,</i>	M. E.
Cole, Harry West,	<i>Milwaukee,</i>	M. E.
Cotton, Charles Sumner,	<i>Friendship,</i>	E. E.
Cowles, Robert Andrew,	<i>Bloomington, Ill.,</i>	M. E.
Davies, George Gibson,	<i>Racine,</i>	M. E.
De Lay, Frederick Abraham,	<i>Madison,</i>	E. E.
Diehl, Guy Elmore,	<i>Elroy,</i>	C. E.
Dow, Herbert William,	<i>Milwaukee,</i>	E. E.
Downing, Benjamin Frank,	<i>Dixon,</i>	E. E.
Earle, Roy Raymond,	<i>Darlington,</i>	E. E.
Early, Arthur Numo,	<i>Milwaukee,</i>	E. E.
Ehreke, Gustave William R.,	<i>Wausau,</i>	E. E.
Ehrnbeck, Anton Daniel,	<i>Appleton,</i>	C. E.
Evraets, John Floreman,	<i>Green Bay,</i>	E. E.
Fairman, Alonzo Stephen,	<i>Brodhead,</i>	C. E.
Gapen, Jotham Clark,	<i>Monroe,</i>	E. E.
Gibson, William Johnson,	<i>Hartland,</i>	M. E.
Grant, John Forrest,	<i>Whitewater,</i>	M. E.
Grey, John Chester,	<i>Windsor,</i>	M. E.
Gund, Joseph Albert,	<i>Freeport, Ill.,</i>	C. E.
Hadfield, Ray Harrison,	<i>Chicago, Ill.,</i>	E. E.
Hammerschlag, James Garfield,	<i>Milwaukee,</i>	M. E.
Hansen, Guido John,	<i>Milwaukee,</i>	E. E.
Helmicks, Gordon Alexander,	<i>Deerfield,</i>	E. E.
Hippenmeyer, Irving Raymond,	<i>Madison,</i>	M. E.
Houghton, Orley Clifton,	<i>La Grange,</i>	E. E.
Hughes, Edward Henry,	<i>Spokane, Wash.,</i>	M. E.
Jenson, Carl William,	<i>River Falls,</i>	C. E.
Johnson, Maurice Ingalls,	<i>Madison,</i>	M. E.
Karlen, Louis Robert,	<i>Monroe,</i>	M. E.
Kelly, Patrick John,	<i>Manitowoc,</i>	E. E.
Kimball, John Ritchie,	<i>Kenosha,</i>	M. E.
Kindt, Albert Frederick,	<i>Milwaukee,</i>	C. E.

Kohl, Oliver Bernard,	<i>Antigo,</i>	E. E.
Kutzke, Charles Julius,	<i>Portage,</i>	E. E.
Lathrop, William Frederick,	<i>Racine,</i>	E. E.
McCue, Philip Wilkins,	<i>Madison,</i>	E. E.
McDonald, Lemuel Leroy,	<i>Rochester,</i>	C. E.
McEvoy, George Edward,	<i>Milwaukee,</i>	M. E.
McNeill, Harrie Thomas,	<i>Sheboygan,</i>	M. E.
Mabbett, Walter Franklin,	<i>Edgerton,</i>	C. E.
Maercklein, Arthur Garfield,	<i>Milwaukee,</i>	M. E.
Malec, Louis,	<i>Madison,</i>	M. E.
Mapel, Carlos Jameson,	<i>Milwaukee,</i>	C. E.
Meehan, Frank Rockwell,	<i>Darlington,</i>	E. E.
Moore, Sherman,	<i>Brodhead,</i>	C. E.
Mors, Fritz Charles,	<i>Madison,</i>	M. E.
Mutchler, Carl Bertollette,	<i>Madison,</i>	C. E.
Nicholas, William,	<i>Monticello,</i>	E. E.
Nichols, Raymond Eugene,	<i>Onalaska,</i>	E. E.
Olsen, Arthur Carl,	<i>Madison,</i>	C. E.
Olson, Sidney,	<i>Racine,</i>	C. E.
Pengra, Preston Winfield,	<i>Madison,</i>	E. E.
Polley, George Andrew,	<i>Albertville,</i>	C. E.
Reichow, Emil Frederick,	<i>Watertown,</i>	C. E.
Schroeder, John Toby,	<i>Hartford,</i>	C. E.
Schroeter, Carl Wilhelm Max,	<i>Milwaukee,</i>	M. E.
Scott, George Alvin,	<i>Oshkosh,</i>	E. E.
Sessinghaus, Carl Garfield,	<i>St. Louis, Mo.,</i>	M. E.
Seydel, James Albert, Jr.,	<i>Chippewa Falls,</i>	M. E.
Sharpe, Raymond Garfield,	<i>Vernon,</i>	M. E.
Spencer, Lloyd Garrison,	<i>Madison,</i>	C. E.
Stevens, Charles Marshall,	<i>Madison,</i>	C. E.
Stieler, Frederick Carl,	<i>Stevens Point,</i>	E. E.
Stillman, Carl Frederick,	<i>Jacksonville, Ill.,</i>	M. E.
Stockman, Louis,	<i>Milton Junction,</i>	C. E.
Sunderland, Ira Croft,	<i>Hartford,</i>	C. E.
Swanton, Bert John,	<i>Brodhead,</i>	C. E.
Thorkelson, William Louis,	<i>Racine,</i>	M. E.
Tyler, Max,	<i>Fargo, N. D.,</i>	C. E.
Vanderkloot, William John,	<i>Chicago, Ill.,</i>	C. E.
White, Charles Marcus,	<i>Delafield,</i>	E. E.
Wilson, John,	<i>Dodgeville,</i>	C. E.
Yeager, Clive,	<i>Newman, Ill.,</i>	E. E.
Young, Henry Walter,	<i>Prairie du Sac,</i>	E. E.

Special Students.

Chamberlain, Paul Fairfield,	<i>Madison,</i>	C. E.
Chamberlain, Myron Elwood,	<i>Ortonville, Minn.,</i>	C. E.
Egan, Richard Anthony,	<i>Carmel,</i>	E. E.
Farris, James Archibald,	<i>Fennimore,</i>	M. E.
Fennell, William James,	<i>Racine,</i>	M. E.
Gallett, Robert Mitchell,	<i>Portage,</i>	E. E.
Goodrell, Charles Glenn,	<i>Sparta,</i>	E. E.
Grant, Francis William,	<i>Madison,</i>	E. E.
Haun, Franklin Elijan,	<i>Madison,</i>	M. E.
Hebard, Roy William,	<i>Augusta,</i>	C. E.
Knutson, Arthur Martin,	<i>Madison,</i>	E. E.
Lyons, Jay David,	<i>Fond du Lac,</i>	E. E.
McCullagh, Robert Henry,	<i>Oak Park, Ill.,</i>	C. E.
McKay, Clyde Marshall,	<i>Chippewa Falls,</i>	M. E.
McKee, Lewis Alvan,	<i>Edwardsville, Ill.,</i>	E. E.
McRay, Clyde Marshall,	<i>Chippewa Falls,</i>	M. E.
Meffert, Edward Percy,	<i>Madison,</i>	C. E.
Morrow, Homer,	<i>Spring Green,</i>	M. E.
Muther, Lorenz Francis,	<i>Oak Park, Ill.,</i>	M. E.
Oberland, Edmund,	<i>Manitowoc,</i>	E. E.
Petrie, August,	<i>Eggersville,</i>	M. E.
Pesta, Martin Henry,	<i>Milwaukee,</i>	M. E.
Rowe, Leonard Lewis,	<i>Madison,</i>	M. E.
Smyth, Edwin Willis,	<i>Stuart, Ia.,</i>	E. E.
Taylor, John Clarence,	<i>Barron,</i>	E. E.

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COLLEGE OF AGRICULTURE.**Long Course.**

Dietrich, William,	<i>Black River Falls,</i>	Senior.
Michels, John,	<i>Calumet Harbor,</i>	Junior.
Olson, George Alfred,	<i>Chicago, Ill.,</i>	Freshman.
Ross, John Agard,	<i>Hinsdale, Ill.,</i>	Freshman.
Taylor, Frederick Dan,	<i>Springfield, Ill.,</i>	Sophomore.
Trott, Harry Louis,	<i>Milwaukee,</i>	Senior.

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Short Course (Second Year).

Andrews, Arthur Leon,	<i>South Wayne.</i>
Austin, James Lee,	<i>Bay View Station.</i>
Baermann, Otto,	<i>Edgar.</i>
Bagnall, James,	<i>Pewaukee.</i>
Baker, Howard Homer,	<i>Mapleton.</i>

Bandoli, Max Albert,	<i>Eau Claire.</i>
Banzhof, George Emanuel,	<i>Elmira, N. Y.</i>
Barthel, Adolph,	<i>Madison.</i>
Becker, Peter Valentine,	<i>Trempealeau.</i>
Boesen, Jens,	<i>North Lake.</i>
Brinkerhoff, Frank Harvey,	<i>Brandon.</i>
Clark, Lester,	<i>Viola.</i>
Colburn, Bert Alonzo,	<i>Chippewa Falls.</i>
Cook, Jay Butler,	<i>Portage.</i>
Curran, William,	<i>Sechlerville.</i>
Dailey, Elmer Jay,	<i>Hudson.</i>
Fillbach, Willie,	<i>Cobb.</i>
Fluetsch, Lucius,	<i>Fountain City.</i>
Fogle, Louis James,	<i>Shell Lake.</i>
Frank Wendelin,	<i>Dufur, Ore.</i>
Freitag, Henry,	<i>Monticello.</i>
Gass, William James,	<i>Sheboygan.</i>
Geise, William George,	<i>Underwood, Ia.</i>
Griswold, Robert Gray,	<i>West Salem.</i>
Hamilton, Homer Willis,	<i>Rantoul, Ill.</i>
Harr, Ernest Bryant,	<i>Rockland.</i>
Hasey, Ralph Austin,	<i>Columbus.</i>
Holston, Eugene,	<i>Ashland.</i>
Kramer, Charles Norman,	<i>Edgerton.</i>
Kufahl, Henry,	<i>Taegesville.</i>
Lassell, Harry James,	<i>Orfordville.</i>
Lynch, Silvester,	<i>Augusta.</i>
McComb, Cardell John,	<i>Ft. Atkinson.</i>
McDonald, John William,	<i>Cambria.</i>
Main, Aura Gilbert,	<i>Appleton.</i>
Martiny, Louis Paul,	<i>North Freedom.</i>
Miller, William Charles,	<i>Center.</i>
Moilien, Tilmar James,	<i>Coon Valley.</i>
Moore, Arthur Destin,	<i>Kingston.</i>
Muenster, Herman,	<i>New Holstein.</i>
Nelson, John,	<i>Kaukauna.</i>
Oddie, George Miller,	<i>Hartman.</i>
Oestreich, Rudolph Charles,	<i>Kewaunee.</i>
Palmer, Philander Levi,	<i>Verona.</i>
Pease, Herman L.,	<i>Castleton Corners, N. Y.</i>
Pollock, Wilbur Horace,	<i>Shirland, Ill.</i>
Preston, Ross Clark,	<i>West De Pere.</i>

Ranum, Peter,	<i>Forward.</i>
Raymer, Jesse Marion,	<i>Cadiz.</i>
Roe, Thomas Cory,	<i>Augusta.</i>
Rohl, John Fred,	<i>London.</i>
Ross, Harry Fleming,	<i>Hinsdale, Ill.</i>
Sather, Edgar Julius,	<i>Coon Valley.</i>
Schaefer, Rudolph John,	<i>Neenah.</i>
Schmidt, Otto Benjamin,	<i>Wayne.</i>
Seaberg, Charles,	<i>Brodhead.</i>
Sherman, Martin Isaac,	<i>Pawlet, Vt.</i>
Skidmore, Elwin Lyman,	<i>Oshkosh.</i>
Snow, Dana Bickford,	<i>Huntley, Ill.</i>
Strnad, Joseph,	<i>Kewaunee.</i>
Tobler, Charles,	<i>Knowville, Tenn.</i>
Trenckmann, Emil Frederick,	<i>Peters, Tex.</i>
Wagner, Joseph Michael,	<i>Hillsboro.</i>
Wahrenbrock, Amos Joe,	<i>Corder, Mo.</i>
Walline, Charles William,	<i>Cambridge, Ill.</i>
White, Thomas Joseph,	<i>Vesper.</i>
Wivestad, Willie Bernard,	<i>Holmen.</i>

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Short Course (First Year).

Abbott, Orlo,	<i>Appleton.</i>
Abbott, Willard,	<i>Appleton.</i>
Alves, Robert Gayle,	<i>Henderson, Ky.</i>
Anderson, Abraham,	<i>Wilder, Minn.</i>
Anderson, George Ankerberg,	<i>Whitehall.</i>
Arneson, Clarence Martin,	<i>Barber.</i>
Bailey, Homer Edward,	<i>Cobb.</i>
Bass, John Edward,	<i>Beloit.</i>
Bean, Arthur Philip,	<i>Hansen.</i>
Bell, Herbert Charles,	<i>Leitersburg, Md.</i>
Bennett, Charles Shattuck,	<i>Belvidere, Ill.</i>
Bennin, Willie Fred.,	<i>New Holstein.</i>
Bentson, Martin,	<i>Viroqua.</i>
Bibby, William Arrol,	<i>Glasgow.</i>
Biles, Francis,	<i>Porcupine.</i>
Boardman, Francis Hamilton,	<i>Boardman.</i>
Bokma, Bokke Alberts,	<i>Midway.</i>
Boley, John,	<i>Blue Mounds.</i>
Buehler, John George,	<i>Monroe.</i>

Buss, John Elof,	<i>Dresser Junction.</i>
Cannon, Elbert Amos,	<i>Marcellon.</i>
Christopher, Olof,	<i>Moline, Ill.</i>
Convey, Frank,	<i>Ridgeway.</i>
Cummins, William Mitchell,	<i>New York City, N. Y.</i>
Danielson, Alfred,	<i>Irving.</i>
Danks, Joseph Russell,	<i>Treadwell, N. Y.</i>
Davis, Howard,	<i>Sparta.</i>
Elk, Charles,	<i>Pepin.</i>
Engersset, Edward Sebestin	<i>Buffalo Center, Ia.</i>
Engersset, Josef Eberhart,	<i>Dell, Minn.</i>
Erickson, Conrad,	<i>West Salem.</i>
Foll, Otto,	<i>Deerfield.</i>
Forsyth, Silas,	<i>Monterey.</i>
Freeman, George Albert,	<i>Sparta.</i>
Froggatt, George,	<i>Ashton.</i>
Gesley, George Herbert,	<i>Beloit.</i>
Gillespie, Earl Lawrence,	<i>Kilbourn.</i>
Glidden, Vernon Fremont,	<i>Britt, Ia.</i>
Gordon, Jesse Roy,	<i>Mineral Point.</i>
Graffien, Amil,	<i>Deerfield.</i>
Grubb, Max,	<i>Carbondale, Colo.</i>
Hackett, Charles Henry,	<i>Baraboo.</i>
Hackett, Granville Prescott,	<i>Baraboo.</i>
Hammond, Fred Lawrence,	<i>Eau Claire.</i>
Hammond, Jennie Matilda,	<i>Eau Claire.</i>
Hanchett, George Edwin, Jr.,	<i>Sparta.</i>
Hanchett, Herman Edward,	<i>Sparta.</i>
Hardie, Laverd,	<i>Glasgow.</i>
Haskin, Irwin Oliver,	<i>Prairie du Sac.</i>
Hedine, Jonas Emil,	<i>Cambridge, Ill.</i>
Hicken, Alfred Berhens,	<i>Pewaukee.</i>
Hitchcock, Homer Ross,	<i>Pecatonica, Ill.</i>
Hobbs, Ross Melvin,	<i>South Wayne.</i>
Holtz, John, Jr.,	<i>Columbus.</i>
Howland, Will Luzern,	<i>Waupun.</i>
Huebbe, Edgar Ernst,	<i>Watertown.</i>
Isaacson, Theodore,	<i>Madison.</i>
Jeffery, William James,	<i>Shullsburg.</i>
Jennings, Warren Price,	<i>Chippewa Falls.</i>
Jensen, James,	<i>Lind.</i>
Jenson, Will Christian,	<i>Waupaca.</i>

Jones, Eben Ezra,	<i>Rockland.</i>
Jostad, Anton,	<i>West Salem.</i>
Klailla, Charles Michael,	<i>Poynette.</i>
Klein, Emil R.,	<i>Bohri.</i>
Kleist, Oscar John,	<i>West Bend.</i>
Kukowinski, John,	<i>Sharon.</i>
Larson, Casper,	<i>Bloomer.</i>
Larson, Wilfred,	<i>Browning.</i>
Lee, Melvin Buttler,	<i>Hillsboro.</i>
Legler, John Lee Grant,	<i>Juda.</i>
Lillibridge, Ira,	<i>Wauwatosa.</i>
Little, George Dixon,	<i>Janesville.</i>
Lobb, Walter Alva,	<i>Ripon.</i>
Lobre, Adrien,	<i>Madison.</i>
McClure, Ara Morgan,	<i>Manhattan, Ill.</i>
McClure, Mark Sydney,	<i>Manhattan, Ill.</i>
McRae, Frank Wallace,	<i>West Salem.</i>
Marken, Otis Albert,	<i>St. Nazianz.</i>
Mathews, Martin John,	<i>Primrose.</i>
Mattison, Thom.,	<i>Blair.</i>
Maxon, Densmore William,	<i>Cedar Creek.</i>
Miles, John James,	<i>Stone Bank.</i>
Molstad, Edwin,	<i>Phillips.</i>
Neal, Will Vern,	<i>Waseca, Minn.</i>
Nelson, Louis,	<i>Argyle.</i>
Nelson, Martin,	<i>Patterson.</i>
Nicolaus, David Christopher,	<i>Troy Center.</i>
Nichols, Herbert Lee,	<i>Galesville.</i>
Niven, William Irving,	<i>Sheridan.</i>
Nix, Herman,	<i>Nix Corners.</i>
Oderbolz, Edward Fred.,	<i>Black River Falls.</i>
Oleson, James Peter,	<i>Ripon.</i>
Olsen, Seward A.,	<i>West Denmark.</i>
Pachernigg, Anthony,	<i>Taylor.</i>
Paden, Harry B.,	<i>Kasbeer, Ill.</i>
Pflum, John,	<i>Kewaskum.</i>
Phelps, Frank Fletcher,	<i>Winnebago, Ill.</i>
Price, Albert Charles,	<i>South Byron.</i>
Raessler, Noyes Romain,	<i>Hanover.</i>
Reineking, Lorenz Fred.,	<i>Franklin.</i>
Rheingans, Edward,	<i>Chippewa Falls.</i>
Roesch, Clyde Earl,	<i>Potosi.</i>

Russell, Arthur C.,	<i>Augusta.</i>
Russell, William,	<i>Augusta.</i>
Rust, Shirley Horatio,	<i>Mukwonago.</i>
Sattler, James,	<i>West Rosendale.</i>
Sarver, Wesley,	<i>Pecatonica, Ill.</i>
Sauers, Abe,	<i>Bluff Siding.</i>
Schmidt, John Joseph,	<i>Wayne.</i>
Schramm, Eric Bernard,	<i>Detroit, Mich.</i>
Sherman, William,	<i>Reedsburg.</i>
Skabo, Theodore George,	<i>Chetek.</i>
Storer, Willis Andrew,	<i>Swaledale, Ia.</i>
Swartzlow, John Julius,	<i>Sparta.</i>
Taylor, John Martin,	<i>La Grange.</i>
Thomas, Charlie William,	<i>Baraboo.</i>
Tomkins, William Clark,	<i>Ashland.</i>
Tratt, Ralph,	<i>Whitewater.</i>
Underwood, Lawrence Charley,	<i>Avoca.</i>
Van Slyke, Melyin David,	<i>Centreville.</i>
Wahrenbrock, Arthur,	<i>Concordia, Mo.</i>
Walline, Henry Walter,	<i>Cambridge, Ill.</i>
Welles, Merritt Lyman,	<i>Perry Center, N. Y.</i>
Wiederhold, John Gustav,	<i>Hooppole, Ill.</i>
Wilkowsky, Charles,	<i>Mishicott.</i>
Wismer, Herman,	<i>Neenah.</i>
Wyse, William Henry,	<i>Princeton.</i>

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DAIRY CLASS.**Second Year.**

Backus, William Arthur,	<i>Madison.</i>
Conry, Elmer Seth,	<i>Sun Prairie.</i>
Cough, Henry Guy,	<i>Appleton.</i>
Millius, Henry August,	<i>Almond.</i>

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First Year.

Ahrens, Albert Fred,	<i>Princeton.</i>
Alexander, Frank,	<i>Mt. Hope.</i>
Armstrong, Willie Leslie,	<i>Cushing.</i>
Arndt, Emil Ernst Willie,	<i>Theresa.</i>
Aufdermauer, Anton,	<i>Hartford.</i>
Aune, John Gilbert,	<i>Baldwin.</i>
Austin, Hallie Waldo,	<i>Rockbridge.</i>

Beadle, Joseph Bales,	<i>Millville.</i>
Bernards, Hubert John,	<i>Ashton.</i>
Boomer, Herbert Eugene,	<i>Monterey.</i>
Brown, Jacob Robert,	<i>Barron.</i>
Buchen, Edward Frederick,	<i>Adell.</i>
Busse, Henry William,	<i>Forestville.</i>
Campton, William Charles,	<i>Darlington.</i>
Carman, Garrett,	<i>Sheboygan.</i>
Clark, James Thomas,	<i>E. Wrightstown.</i>
Clarson, John,	<i>Homer.</i>
Cretten, Henry Joseph,	<i>Mishicot.</i>
Cunningham, John Glaysure,	<i>Rockbridge.</i>
Cupery, Yatse Sipke,	<i>Randolph.</i>
Curtis, John Hiram,	<i>Centerville.</i>
Day, Pat O.,	<i>Madison.</i>
Downer, Arthur George,	<i>Appleton.</i>
Dufner, George Oscar,	<i>Fennimore.</i>
Eggart, Otto William,	<i>Marshall.</i>
Elliott, Varnum Noyes,	<i>Paint Valley, O.</i>
Ells, Edward James,	<i>Tibbets.</i>
Emerson, Edward,	<i>North Bend.</i>
Euger, John,	<i>Union Mills.</i>
Ensign, James Ashley,	<i>Weyauwega.</i>
Evenson, Martin Joseph,	<i>Fish Creek.</i>
Frederick, Walter Edmond,	<i>Baldwin.</i>
Frink, Clarence Benjamin,	<i>Fort Pupon, Colo.</i>
Fuller, Ora Frank,	<i>Northwood, Ia.</i>
Ganschon, Henry Frank,	<i>Bonduel.</i>
Hall, John Veazey,	<i>James, Ala.</i>
Haugan, Olaf H.,	<i>Farmington, Ore.</i>
Haugen, Halsten,	<i>Black Earth.</i>
Helland, Herbert Edward,	<i>Black Earth.</i>
Hendrix, Herbert Alfred,	<i>Bancroft, Minn.</i>
Henseler, Nick,	<i>Bakerville.</i>
Hepp, Lyman Lewis,	<i>Wonevot.</i>
Hill, William Henry,	<i>Baraboo.</i>
Holbrook, Benjamin Franklin,	<i>Arkansaw.</i>
Holkins, Charles Newton,	<i>Litchfield, Mich.</i>
Hollinger, Milton,	<i>Hebron.</i>
Hollister, George Arthur,	<i>New Lisbon.</i>
Huffmann, Howard,	<i>Rockbridge.</i>
Jensen, Nels Chris,	<i>New Lisbon.</i>

Jungwirth, Joseph,	<i>Durand.</i>
Kading, Anton H.,	<i>Black Earth.</i>
Kelly, Joseph William,	<i>Mauston.</i>
Kenny, Earl Alward,	<i>Platteville.</i>
Kickbusch, William Edward,	<i>Stettin.</i>
Kielsmeier, Edward Henry,	<i>Timothy.</i>
Kielsmeier, Otto August,	<i>Hika.</i>
Kincannon, Archibald Tilden,	<i>Westport.</i>
Kleiner, Frank,	<i>Algoma.</i>
Klotz, John Lowie,	<i>St. Anna.</i>
Knoke, Otto Emil,	<i>New London.</i>
Koepsell, Martin Gustaf,	<i>Mayville.</i>
Kohshok, Edwin Arthur,	<i>Granton.</i>
Kramer, Lawrence John,	<i>Eastman.</i>
Larson, Christ,	<i>Stone Bank.</i>
Linton, John Thomas,	<i>Fennimore.</i>
Loehrke, Albert Emil,	<i>Lomira.</i>
Marten, August Fred,	<i>Theresa.</i>
Martin, Charles Albert,	<i>Darlington.</i>
Mattson, John,	<i>Jenson.</i>
McCready, John,	<i>Harrison, Ont., Canada.</i>
McKee, S. Montague,	<i>Portland, Mich.</i>
Merwin, Francis John,	<i>Boscobel.</i>
Moore, George Henry,	<i>Polo, Ill.</i>
Moore, Thomas,	<i>Lone Rock.</i>
Morris, Levi George,	<i>Waterville.</i>
Morrison, George William,	<i>Fennimore.</i>
Moser, Edward Lincoln,	<i>Tell.</i>
Myers, Myeron,	<i>Oconomowoc.</i>
Nissen, Markus Fredrick,	<i>Haugen, Minn.</i>
Nowak, Joseph Charles,	<i>Castle Rock.</i>
Ott, Lyman,	<i>Eau Galle.</i>
Philips, Charles S.,	<i>West Salem.</i>
Perschbacher, Adolph Gustaph,	<i>West Bend.</i>
Peterson, Edwin C.,	<i>Garfield.</i>
Powers, Charles Edward,	<i>Fayetteville.</i>
Powranke, Willie Fred,	<i>Chilton.</i>
Quade, Henry William,	<i>Watertown.</i>
Racek, Henry John,	<i>Alloa.</i>
Rockney, Bernard,	<i>Cambridge.</i>
Rusch, Otto Albert,	<i>Reedsville.</i>
Sanborn, Guy Walter,	<i>Lone Rock.</i>

Santo, William August,	<i>Faribault, Minn.</i>
Sawyer, Lewis,	<i>Neptune.</i>
Schauf, Albert Frank.	<i>Neptune.</i>
Schettler, Herman Charlie,	<i>Mt. Vernon.</i>
Schladweiler, Gerhard,	<i>Newfane.</i>
Schilling, Warren Charles,	<i>Green Bay.</i>
Schneider, Adolph,	<i>Ellisville.</i>
Scott, Cassius M. Clay,	<i>Romeo, Mich.</i>
Sebion, Alfred,	<i>Monterey.</i>
Sebion, Theodore,	<i>* Monterey.</i>
Sloan, Andrew Jr.,	<i>Forestville.</i>
Smith, Roy L.,	<i>Granger, Ill.</i>
Southard, Roy Bertrum,	<i>Lone Rock.</i>
Speneman, Henry,	<i>Oakdale, Ill.</i>
Stodieck, John Henry,	<i>Gardnerville, Nev.</i>
Stoneman, William,	<i>Forestville.</i>
Straubel, Arthur Fred,	<i>Green Bay.</i>
Sutcliffe, Frank,	<i>Mazomanie.</i>
Tisdale, James D.,	<i>Byrds Creek.</i>
Torp, Christian Brunchorst,	<i>Ogdensburg.</i>
Truax, Daniel Frank,	<i>Chippewa Falls.</i>
Vassau, Joseph Napoleon,	<i>Star Prairie.</i>
Verthein, William,	<i>Milwaukee.</i>
Wagner, Paul Whitcomb,	<i>Green Bay.</i>
Wood, Geo. Daniel,	<i>Appleton.</i>
Zeitler, Albert Henry,	<i>Johnson Creek.</i>

COLLEGE OF LAW.

Senior Class.

Anderson, Earl Steed,	<i>Madison.</i>
Barney, Charles Richard,	<i>Mauston.</i>
Baumgarten, Otto Charles,	<i>Milwaukee.</i>
Baxter, Charles Melvin,	<i>Waupaca.</i>
Cate, Walter Scott,	<i>Stevens Point.</i>
Clausen, Frederick Harold,	<i>Fox Lake.</i>
Cryderman, Charles Alexander,	<i>Milwaukee.</i>
Curtis, Alfred Tennyson,	<i>Madison.</i>
Devney, Edward James,	<i>Reeseville.</i>
Edwards, Clarence Bushnell,	<i>Madison.</i>
Evans, Evan Alfred,	<i>Spring Green.</i>
Fisher, John Lincoln,	<i>Janesville.</i>
Foley, Michael Francis,	<i>Juneau.</i>

Frye, Herman Sidney,	<i>Mason City, Ia.</i>
Gannon, Walter Scott,	<i>Cedarburg.</i>
Gault, John Henry,	<i>Poynette.</i>
Gernon, George Edward,	<i>Madison.</i>
Gilbert, Frank Lynch,	<i>Madison.</i>
Gilman, Stephen Warren,	<i>Burke.</i>
Greenwood, Charles Sheen,	<i>Lake Mills.</i>
Gregg, John Parker,	<i>Madison.</i>
Groelle, Frederick Ford,	<i>Unity.</i>
Hartwell, Fred Hoffman,	<i>La Crosse.</i>
Heyn, Bernard Goldsmith,	<i>Milwaukee.</i>
Hoyt, Heber Bishop,	<i>Waterloo.</i>
Humphrey, Thomas Augustus,	<i>Dancey.</i>
Hutchinson, Richard Gill,	<i>Rose Lawn.</i>
Jackson, Russell,	<i>Madison.</i>
Kelley, John William,	<i>Menomonie.</i>
Kreiss, William Henry,	<i>Appleton.</i>
Klatte, William August,	<i>Milwaukee.</i>
Lowrey, Robert Burr,	<i>La Crosse.</i>
McPhail, Archibald Cameron,	<i>Stevens Point.</i>
Martin, George Cushing,	<i>Omaha, Neb.</i>
Mason, Vroman,	<i>Madison.</i>
Miller, John Oscar,	<i>Marinette.</i>
Minty, Louis William,	<i>Madison.</i>
Murat, Leroy John Nicholai,	<i>Stevens Point.</i>
Oliver, James Frederick,	<i>Belleville.</i>
Putnam, Giles Henry,	<i>Green Bush.</i>
Rehm, Henry Charles,	<i>Milwaukee.</i>
Roddis, Hamilton,	<i>Marshfield.</i>
Sawyer, Hiram Arthur,	<i>Hartford.</i>
Schendel, Oscar John,	<i>Columbus.</i>
Seymour, Harry Ozias,	<i>Lake Geneva.</i>
Shaw, James Deyo,	<i>Wawautosa.</i>
Sidler, Cornelius Anthony,	<i>Milwaukee.</i>
Smelker, Roy C.,	<i>Dodgeville.</i>
Tillotson, Earle Clarence,	<i>Baraboo.</i>
Tolrud, Thomas Anderson,	<i>Peterson, Minn.</i>
Torkelson, Theodore Barnard,	<i>Black River Falls.</i>
True, Edgar Curtis,	<i>Portage.</i>
Voigt, Edward,	<i>Milwaukee.</i>
Wild, Robert,	<i>Milwaukee.</i>
Winterbotham, John Miller,	<i>Eau Claire.</i>
Woodmansee, John Frazier,	<i>Milwaukee.</i>

Middle Class.

Alexander, George Arnold,	<i>Manitowoc.</i>
Andrews, Ross Everett,	<i>Mukwonago.</i>
Backus, August Charles,	<i>Kewaskum.</i>
Bartlett, Charles Lackey,	<i>Clayton, Ill.</i>
Bartman, John Henry,	<i>Appleton.</i>
Berg, Theodore,	<i>Appleton.</i>
Biersach, William Mann,	<i>Milwaukee.</i>
Blakeley, Henry Justus,	<i>Milwaukee.</i>
Bowler, James J.,	<i>Sparta.</i>
von Cotzhausen, Arthur,	<i>Milwaukee.</i>
Coyle, John Joseph,	<i>Freeport, Ill.</i>
Crawford, George,	<i>Oconto.</i>
Crego, Irving,	<i>Aurora, Ill.</i>
Dietz, Robert Earl,	<i>Mayville.</i>
Finnigan, William Everett,	<i>Green Bay.</i>
Gilmore, Eugene Lettler,	<i>Monticello, Ia.</i>
Glasier, Gilson Gardner,	<i>Wauautosa.</i>
Gold, Walter Lewis,	<i>Milwaukee.</i>
Gurnee, Paul Dennison,	<i>Madison.</i>
Hanks, David Arthur,	<i>Madison.</i>
Hay, William Henry,	<i>Oshkosh.</i>
Hensel, Earl Franklin,	<i>Arcadia.</i>
Hillesheim, John Adolphus,	<i>Dwight, Ill.</i>
Husting, Berthold Juneau,	<i>Mayville.</i>
Johnson, Buchanan,	<i>Sheridan.</i>
Johnson, Ole Lawrence,	<i>Black River Falls.</i>
Jones, William Thomas,	<i>Spring Water.</i>
Lewis, Howard Wilton,	<i>Mcndota, Ill.</i>
McGrath, William Howard,	<i>Argyle.</i>
McManamy, Francis Vincent,	<i>Cashton.</i>
McMillan, Donald J.,	<i>Neillsville.</i>
McNamara, Frank Landis,	<i>Janesville.</i>
Main, John Smith,	<i>Madison.</i>
Montgomery, Charles Carroll,	<i>Omaha, Neb.</i>
Moran, John,	<i>De Forest.</i>
Morrow, William Ambrose,	<i>Omro.</i>
Morse, Elmer Addison,	<i>Ripon.</i>
O'Dea, Patrick John,	<i>Melbourne, Australia.</i>
Okoneski, John,	<i>Wausau.</i>
Pattee, Frank Denton,	<i>Lowell, Ind.</i>
Peterson, Frederick Burns,	<i>Madison.</i>

Pierrelee, Victor,	<i>Granton.</i>
Pritzlaff, Adolph Herman,	<i>Milwaukee.</i>
Risjord, Gullick Nelson,	<i>Madison.</i>
Robbins, Samuel Brownlee,	<i>Carthage, Ill.</i>
Rodolf, Frank McKee,	<i>Muscoda.</i>
Rush, Walter James,	<i>Waterford.</i>
Sarau, George Adolphus,	<i>Oshkosh.</i>
Saucerman, Willard Therman,	<i>Winslow, Ill.</i>
Siggelko, Herbert Scott,	<i>Madison.</i>
Silber, Henry Mamlock,	<i>Milwaukee.</i>
Smith, Lloyd Dean,	<i>Amherst.</i>
Smith, Richard Edwin,	<i>Eau Claire.</i>
Smith, William Noble,	<i>Madison.</i>
Tallman, George Kemp,	<i>Janesville.</i>
Tilden, George Huntington,	<i>Wellesley, Mass.</i>
Tirrill, Edward Drew,	<i>Lodi.</i>
Van Steenwyk, Gysbert,	<i>La Crosse.</i>
Werve, Charles Benjamin,	<i>Kenosha.</i>
Williams, Glenn Herbert,	<i>Grand Rapids.</i>
Wolf, Albert Christian,	<i>Greenville.</i>

Junior Class.

Bender, Walter Henry Colyer,	<i>Milwaukee.</i>
Berg, William Carl,	<i>Madison.</i>
Bingham, Roy Elson,	<i>Arcadia.</i>
Bossard, Otto,	<i>La Crosse.</i>
Boynton, William Parker,	<i>Jerseyville, Ill.</i>
Bowman, Robert Oscar,	<i>Lodi.</i>
Bowers, Ray,	<i>Delavan.</i>
Brazeau, Theodore Walter,	<i>Grand Rapids.</i>
Christenson, Nels Peter,	<i>Neenah.</i>
Clancy, Henry Patrick,	<i>Racine.</i>
Classon, Allan Vain,	<i>Oconto.</i>
Cody, Harry Arthur,	<i>Ripon.</i>
Crabtree, John Buell,	<i>Dixon, Ill.</i>
Crocker, Levi Archibald,	<i>Madison.</i>
Curtis, Nathan Stephenson,	<i>Madison.</i>
Davies, Joseph Edward Paynter	<i>Watertown.</i>
Detling, Henry Arthur,	<i>Sheboygan.</i>
Doolan, Francis Lawrence,	<i>Milwaukee.</i>
Ela, Emerson,	<i>Rochester.</i>
Elver, Elmore Theodore,	<i>Madison.</i>

Fairchild, Arthur Wilson,	<i>Green Bay.</i>
Fox, Edward Tappan,	<i>Milwaukee.</i>
Geilfuss, Carl Frederick,	<i>Milwaukee.</i>
Griffith, Max Wilder,	<i>Milwaukee.</i>
Gugel, Frank Henry,	<i>Madison.</i>
Hines, Martin Stephen,	<i>Highland.</i>
Hocking, William Josephus,	<i>Darlington.</i>
Holt, Nels Elias,	<i>Newark, Ill.</i>
Hutson, Charles Thomas,	<i>Edgerton.</i>
Jeffrey, John James,	<i>Centralia.</i>
Jenner, Edward David,	<i>Milwaukee.</i>
Kelley, John Martin,	<i>Portage.</i>
Knowles, Edwin Corydon French,	<i>West Superior.</i>
Kress, George William Bache,	<i>Wellsboro, Pa.</i>
Kroesing Oscar,	<i>Chilton.</i>
Kroncke, Jacob,	<i>Kenosha.</i>
Landeck, Fred,	<i>Milwaukee.</i>
Laube, Frank Joseph,	<i>Brodhead.</i>
Lavoy, Michael Joseph,	<i>St. Julienne, Quebec.</i>
Leahy, Thomas William,	<i>Marion, Ia.</i>
Lowell, Jacob, Jr.,	<i>Fargo, N. D.</i>
McArdle, Michael William,	<i>Baileys Harbor.</i>
McCarthy, Loyal Henry,	<i>Albion.</i>
Maercklein, Arthur Garfield,	<i>Milwaukee.</i>
Mills, Lewis Welling,	<i>Racine.</i>
Monson, Martin Henry,	<i>De Forest.</i>
Nelson, George Bliss,	<i>Amherst.</i>
Nelson, Robert Nicholie,	<i>Lodi.</i>
Newcomer, Carl Stoddard,	<i>Eldora, Ia.</i>
Norton, William Clarence,	<i>Elkhorn.</i>
Oestreich, Otto Albert,	<i>Keauaunee.</i>
Okeliher, Victor Joseph,	<i>Oconto.</i>
Owen, Asa Kenton,	<i>Arcadia.</i>
Persons, Warren Milton,	<i>Madison.</i>
Peterson, Charles Nelson,	<i>Racine.</i>
Pollard, Amos Weber,	<i>Portage.</i>
Potts, Ira David,	<i>Fox Lake.</i>
Radesleben, Frank,	<i>Eau Claire.</i>
Regner, Frank Patrick,	<i>West Bend.</i>
Ringle, Oscar Louis,	<i>Wausau.</i>
Roberts, David Milton,	<i>Leeds Center.</i>
Schneider, Charles Alfred,	<i>Oshkosh.</i>

Schoengarth, Oscar William,	Neillsville.
Schumaker, Raymond H.,	McGregor, Ia.
Smith, Elroy Wallace,	Milwaukee.
Smith, Ralph Elbert,	Waupun.
Stebbins, Byron Houghton,	Little Falls, N. Y.
Stellwagen, Stephen Augustus,	Colorado Springs, Colo.
Sweet, William,	Waupun.
Taylor, Henry Herman,	Barron.
Thomas, Herbert Henry,	Darlington.
Thompson, Thomas S.,	Mt. Horeb.
Thomson, Charles Ralph,	Tomah.
Thomson, Fred,	Tomah.
Tomlinson, Roy Everett,	Oak Park, Ill.
Tradewell, Eugene Stanley,	Western Union.
Tratt, Paul,	Whitewater.
Trewick, Joseph Nicholas,	Mineral Point.
Trippel, Frank Charles,	Milton Junction.
Tscharner, Peter,	Alma.
Tyrrell, David Franklin,	Marinette.
Vincent, Harry William,	Madison.
Walters, William Alexander,	Chicago, Ill.
Waters, Herbert,	Fond du Lac.
Wheeler, Albert Kimball,	Janesville.
Wipperman, Richard,	Grand Rapids.
Wilcox, Nelson James,	Eau Claire.

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Special Students.

Atherton, Clarence Morgan,	Racine.
Case, Henry Cadby,	Milwaukee.
Hicks, Jay William,	Oshkosh.
Jackowska, Antoinette Victoria,	Milwaukee.
Kiser, Fitz Henry,	Whitewater.
Kopp, Arthur William,	Platteville.
McGee, Charles Anson Augustus,	Milwaukee.
Martin, John Francis,	Green Bay.
Morson, Hiram Frederick,	Antigo.
Thorn, Paul Cheney,	New London.

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SCHOOL OF PHARMACY.**Four Years' Course.**

Alden, Frederick William,	Madison,	Special.
Denniston, Rollin Henry,	Burlington,	Senior.

Kopp, George Hermann,	<i>Chippewa Falls,</i>	Sophomore.
Nolte, Simon Christian H.,	<i>Milwaukee,</i>	Senior.
Schroeder, John Hugo,	<i>Madison,</i>	Special.
Swarthout, Susie,	<i>La Crosse,</i>	Freshman.

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Three Years' Course.

Brandel, Irvin Walter,	<i>Madison,</i>	Senior.
Chech, Charles William,	<i>Madison,</i>	Sophomore.
Dieffenbach, Ernst William,	<i>Milwaukee,</i>	Sophomore.
*Doty, Clarence Bintliff,	<i>Edgerton,</i>	Junior.
Eastman, Cora Belle,	<i>Montfort,</i>	Sophomore.
Eighmy, Alva,	<i>McFarland,</i>	Senior.
Eighmy, Frank Wilbur,	<i>McFarland,</i>	Junior.
Funck, George William,	<i>Milwaukee,</i>	Senior.
Geerlings, Isaac,	<i>Milwaukee,</i>	Junior.
Gorr, Charles William,	<i>Milwaukee,</i>	Senior.
Guidinger, Herbert Lewis,	<i>Northwood, Ia.,</i>	Sophomore.
Hatton, Fred Hamond,	<i>Madison,</i>	Junior.
Hazelhurst, Samuel Jr.,	<i>Winnetka, Ill.,</i>	Sophomore.
Henning, Albert Louis,	<i>Iron Ridge,</i>	Senior.
Jensen, August Edham,	<i>Baldwin,</i>	Junior.
Kimball, Myra Weston,	<i>Green Bay,</i>	Senior.
Klueter, Harry,	<i>Madison,</i>	Junior.
Krembs, Alexander, Jr.,	<i>Stevens Point,</i>	Sophomore.
Neven, Arthur Valentine,	<i>Green Bay,</i>	Sophomore.
Randall, May Inez,	<i>Ladoga,</i>	Senior.
Selck, William Henry,	<i>Arcadia,</i>	Sophomore.
Shields, George Alvin,	<i>Mazomanie,</i>	Junior.
Strauss, Richard James,	<i>Appleton,</i>	Junior.
Tandvig, Albert Nicholas,	<i>Madison,</i>	Junior.
Treber, John Alfred,	<i>Deadwood, S. D.,</i>	Sophomore.
Treber, William Lawrence,	<i>Deadwood, S. D.,</i>	Sophomore.
Upjohn, James,	<i>Fond du Lac,</i>	Senior.
Windes, Thomas Guy,	<i>Winnetka, Ill.,</i>	Sophomore.

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Two Years' Course.

Bailey, Mark Arthur,	<i>Pennimore,</i>	Junior.
Criddle, Arthur George,	<i>Sloughton,</i>	Senior.
Dexheimer, Frederick Rudolph,	<i>Pl. Atkinson,</i>	Junior.
Ehlert, Fred Gustave,	<i>Milwaukee,</i>	Senior.

*Deceased.

Guelson, Ole G.,	Orfordsville,	Junior.
Hollen, Henry Bronson,	Eau Claire,	Senior.
Hubenthal, Charles Gilbert,	Waukesha,	Senior.
Kellogg, Harry Lyman,	Oconomowoc,	Senior.
Marvin, Mae Elizabeth,	Fairchild,	Junior.
Mayer, Lewis Frederick,	Kewaskum,	Junior.
Peluneck, Rudolph William,	Alma,	Junior.
Peterson, Harvey Ovie,	Colfax,	Junior.
Potter, Roy Pilling,	Mauston,	Junior.
Schulz, Henry Louis,	Watertown,	Senior.
Thomas, Caroline Cornelia,	Prairie du Chien,	Junior.
Thomas, John Alexander,	Prairie du Chien,	Junior.
Treloar, Delbert Claude,	Waukesha,	Senior.
Woltersdorf, Albert Henry,	Columbus,	Junior.

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SCHOOL OF MUSIC.

Graduate.

Bliss, Eleanor Beattie,	Richland Center.
Fordyce, Maud Beryl,	Fond du Lac.
Olson, Clara,	Madison.
Westenhaver, Adda Josephine,	Madison.

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Collegiate.

Third Year.

Baxter, Mary Earle,	Cedar Rapids, Ia.
Beck, Clara Margaret,	Madison.
Brand, Bessie Goodrich,	Madison.
Dibble, Olive Amanda,	Madison.
Fowler, William Muzzy,	Madison.
Garrison, Grace Gertrude,	Lone Rock.
Gray, Zoe Lenore,	Warren, Ill.
Pickarts, Mary Eliza,	Madison.
Walden, Alice,	Argyle.
Wippert, Emma,	Milwaukee.
Young, Allyn Abbott,	Rapid City, S. D.

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Second Year.

Alexander, Daisy Cecile,	Madison.
Baer, Clarence Allen,	Milwaukee.
Bolender, Charles Barton,	Monroe.
Brigham, Bertha Blanche,	Evansville.

Clement, Grace Beatrice,	<i>Sun Prairie.</i>
Dahle, Eleonore Benedicte,	<i>Mt. Horeb.</i>
Dow, Ethel,	<i>Stoughton.</i>
Dye, Daisy Rumina,	<i>Madison.</i>
Frazier, Raymond Reuben,	<i>Madison.</i>
Gale, Gladys,	<i>Reedsburg.</i>
Gapen, Anna Mercedes,	<i>Madison.</i>
Gibbons, Frank Clark,	<i>Sun Prairie.</i>
Glenn, Mary Alice,	<i>Rockford.</i>
Gugler, Gretchen,	<i>Milwaukee.</i>
Hammill, Edith,	<i>Jefferson.</i>
Hayhurst, Elizabeth,	<i>Waterloo.</i>
Heim, Frederick Carl,	<i>Madison.</i>
Johnson, Evelyn Ottilia,	<i>La Crosse.</i>
Klusmann, Josephine Katherine,	<i>Madison.</i>
Koltcs, Mary,	<i>Madison.</i>
Langley, Ina Virginia,	<i>Merrill.</i>
Lee, Jessamine,	<i>Vermillion, S. D.</i>
Lipe, Olive,	<i>Mt. Morris, Ill.</i>
Lueders, Minnie Magdalene,	<i>Madison.</i>
Main, John Smith,	<i>Madison.</i>
Mason, Max,	<i>Madison.</i>
Mathias, Mary Constance,	<i>Madison.</i>
Mayers, Charles,	<i>Madison.</i>
Merrick, Alice Winona,	<i>Madison.</i>
Montgomery, Janette Louise,	<i>Madison.</i>
Russell, Harry Alexander,	<i>Madison.</i>
Seeber, Sarah Jennie,	<i>Waterloo.</i>
Schlimgen, Michael John,	<i>Madison.</i>
Schockley, Mabel,	<i>Sun Prairie.</i>
Smith, Mary Campbell,	<i>Madison.</i>
Thompson, Martha,	<i>Mt. Horeb.</i>

Collegiate.**First Year.**

Bach, Maude Erma,	<i>Kewaunee.</i>
Brownson, Laura,	<i>Sharon.</i>
Bull, Dina,	<i>Madison.</i>
Chapman, Bertha Estelle,	<i>Plainfield.</i>
Clifford, Ellen Ora,	<i>Madison.</i>
Comstock, Lelia Leona,	<i>Oregon.</i>

Coolidge, Edith Louise,	<i>Middleton.</i>
Drinker, Florence Lydia,	<i>Portage.</i>
Fischer, Anna Barbara,	<i>Paoli.</i>
Freschl, Edward,	<i>Milwaukee.</i>
Glenz, Johanna Frances,	<i>Madison.</i>
Hinkley, Louise,	<i>Janesville.</i>
Hubbell, Charles Herbert,	<i>Madison.</i>
King, Bessie Susan,	<i>Neillsville.</i>
Lamb, Ellen Ware,	<i>Madison.</i>
Main, Henrietta Phillips,	<i>Madison.</i>
Martin, Emeline,	<i>Madison.</i>
Nash, James Bertram,	<i>Centralia.</i>
Nelson, Florence Eugenia Van Slyke,	<i>Madison.</i>
Pease, Raymond Burnette,	<i>Oregon.</i>
Phelps, Charles Austin,	<i>Milwaukee.</i>
Phoenix, Rosalind Naomi,	<i>Baraboo.</i>
Pickford, Theo Beatrice,	<i>Madison.</i>
Ranum, Blanche Hilma,	<i>La Crosse.</i>
Renk, Mary Catherine,	<i>Sun Prairie.</i>
Riley, Caroline Wheeler,	<i>Madison.</i>
Rollins, Emma,	<i>Evansville.</i>
Schott, Lucca Clara,	<i>Madison.</i>
Seymour, Arthur Romeyn,	<i>Madison.</i>
Slightam, Madeline Fairman,	<i>Madison.</i>
Smith, Winnifred May,	<i>Sturgeon Bay.</i>
Snively, Helen Adams,	<i>Lincoln, Neb.</i>
Swarthout, Susie,	<i>La Crosse.</i>

Academic.

Abbott, Clarice Belle,	<i>Madison.</i>
Abbott, Maud Elinore,	<i>Madison.</i>
Adams, Edna Couper,	<i>Madison.</i>
Adams, Mabel,	<i>Madison.</i>
Adamson, Arthur,	<i>Madison.</i>
Albrecht, Sebastian,	<i>Milwaukee.</i>
Alford, Alice Irene,	<i>Madison.</i>
Alford, Hazel Viola,	<i>Madison.</i>
Allen, Charles Chester,	<i>Kenosha.</i>
Anderson, Anna Louise,	<i>Madison.</i>
Askew, Amelia Alice,	<i>Madison.</i>
Bach, Frank Charles,	<i>Madison.</i>
Boehmer, Lillian,	<i>Madison.</i>

Brown, Althea Huntington,	<i>Madison.</i>
Bull, Eyvind,	<i>Madison.</i>
Bunker, Tracy,	<i>Woodstock, Ill.</i>
Burmester, Nellie Mildred,	<i>Middleton.</i>
Cain, Elmer Ellsworth,	<i>Wauwatosa.</i>
Chynoweth, Emily Ellen,	<i>Madison.</i>
Conry, Grace Luring,	<i>Calais, Me.</i>
Dean, George H.,	<i>Madison.</i>
Dye, Rose Aileen,	<i>Madison.</i>
Fagg, Marcus Charles,	<i>Madison.</i>
Frazier, Augusta Wood,	<i>Madison.</i>
Freeborn, Lorena Oina,	<i>Richland Center.</i>
Gallett, Robert Mitchell,	<i>Portage.</i>
Gath, Bertha May,	<i>Madison.</i>
Goodwin, Myrtle,	<i>Mazomanie.</i>
Green, Adah Carmelletta,	<i>Madison.</i>
Groves, Regina Eunice,	<i>Madison.</i>
Haight, George Ives,	<i>Rockdale.</i>
Hatch, Grace Franklin Adams,	<i>Madison.</i>
Hayden, Jessie	<i>Lodi.</i>
Holt, Marietta,	<i>Madison.</i>
Holte, Margaret,	<i>Newark, Ill.</i>
Kelley, Minnie,	<i>Madison.</i>
Kellogg, Maude Marian,	<i>Madison.</i>
Klein, Mathilda,	<i>Black River Falls.</i>
Livermore, Florence Donna,	<i>Madison.</i>
McKenna, Lucy,	<i>Blanchardville.</i>
Malloy, Kathryn Gertrude,	<i>Fond du Lac.</i>
Marshall, Mary Elizabeth,	<i>Madison.</i>
Morgan, Alexander William,	<i>Madison.</i>
Mumford, Eugene Bishop,	<i>New Harmony, Ind.</i>
Neckerman, Reuben Julius,	<i>Madison.</i>
Owen, Emily Pratt,	<i>Madison.</i>
Palm, Irene,	<i>Madison.</i>
Pease, Clifford Coleman,	<i>Oregon.</i>
Percival, Ida Jennett,	<i>Madison.</i>
Pfund, Annie,	<i>Madison.</i>
Pierce, Helen,	<i>Madison.</i>
Putnam, May,	<i>Madison.</i>
Quiroz, Anastasia Luise,	<i>Milwaukee.</i>
Renk, William Frank,	<i>Sun Prairie.</i>
Rice, Myrtle Eulalie,	<i>Madison.</i>

Richards, Lillian Ethel,	<i>Lake Geneva.</i>
Rinder, Elinore Anna,	<i>Madison.</i>
Savage, John Lucian,	<i>Madison.</i>
Simonds, Wendell Phillips,	<i>Madison.</i>
Smith, Elenor Clemons,	<i>Madison.</i>
Smith, Jessie Clemons,	<i>Madison.</i>
Smith, Mary Elizabeth,	<i>Madison.</i>
Smyth, Herman Augustine,	<i>Madison.</i>
Spaulding, Henry Harrison,	<i>Madison.</i>
Steere, Glenn S.,	<i>Plymouth.</i>
Stone, Belva Gladys,	<i>Bloomington.</i>
Sumner, Grace Delight,	<i>Madison.</i>
Van Hise, Mary Janet,	<i>Madison.</i>
Wagner, Meta,	<i>Madison.</i>
Winslow, John Seymour,	<i>Madison.</i>
Woodward, Florence,	<i>Madison.</i>

WISCONSIN SUMMER SCHOOL.

Adair, Elizabeth,	Oak Park, Ill., 8th Grade, Pub. School.
Alderson, Persie Hurd,	Fayette, Ia.,
Allen, Charles Elmer,	Madison, Student, U. W.
Anderson, Anna Elizabeth,	Merrill, Prin., High School.
Anderson, Andrea Martina,	Stoughton, Ass't, High School.
Barr, Carrie Belle,	Pine River, Grammar Grade, Wausau.
Barron, Mary,	Janesville, 3rd Grade, Public School.
Basing, Mollie Margarite,	Berlin, Intermediate Grade, Pub. S.
Betten, I. N.	Grand Rapids, Ass't High School.
Birge, Edward Grant,	Madison, Student, High School.
Blackburn, Arthur William,	Madison,
Borresen, Lilly Mary E.,	La Crosse, Ass't, High School.
Bowles, Amy,	Janesville, 1st Grade, Public School.
Bradford, Mary Davison,	Stevens Point, State Normal School.
Bradford, William,	Stevens Point, Student, Normal School.
Brickley, Elvira,	Menomonie, County Superintendent.
Briere, Carolyn L.,	Grand Rapids, 7 and 8 G., La Crosse.
Brockmann, Johanna Sophia	M., Watertown, Prim Grade, Columbus.
Brown, S. Edith,	Madison, Ass't High S. Eau Claire.
Buell, Phoebe Lucinda,	Sun Prairie,
Burce, Ethel Emma,	Eau Claire,

Burnett, Birdie Maude,	<i>Stoughton</i> , 6th Grade, Public School.
Carlton, Mary Louise,	<i>Madison</i> , Ass't High School, De Forest.
Carpenter, Annie Harriette,	<i>Stoughton</i> , Ass't high School, Wausau.
Carpenter, D'Agnes,	<i>Chicago</i> , Public School.
Carpenter, Louise,	<i>Janesville</i> , 6th Grade, Public School.
Casford, E. Lenore,	<i>Janesville</i> , 6th Grade, Public School.
Chamberlain, Celeste,	<i>Kaukauna</i> , 3rd Grade, Public School.
Clark, Myrtes Estelle,	<i>Mayville</i> , Ass't, High School.
Colburn, Willis Paul,	<i>Cassville</i> , Prin., High School.
Cole, Ira Lewis,	<i>Athens</i> , Prin., Graded School.
Collins, William Benjamin,	<i>Sheboygan</i> , Prin., Graded S., Mosel.
Connolly, Mary Mabel,	<i>Berlin</i> , 6th Grade, Public School.
Cook, Alfred Newton,	<i>Madison</i> , Assistant, U. W.
Cook, Louise,	<i>Columbus</i> , 5th Grade, Public School.
Cooney, Mary,	<i>Sandusky</i> ,
Cottell, Louisa,	<i>Chicago, Ill.</i> , 3rd Grade, Public S.
Crangle, Mary,	<i>Watertown</i> , 8th Grade, Public School.
Crosby, Frances Sarah,	<i>Madison</i> ,
Daniel, Richard B.,	<i>Carlinville, Ill.</i> , Sup't, Primghar, Ia.
Darrow, William,	<i>Yellowstone</i> , Ass't Green Bay High S.
Devlin, Alice Elizabeth,	<i>Woodworth</i> , Ass't H. S., Appleton.
Devlin, Sarah Rebecca,	<i>Woodworth</i> , Gram. G., S. N. S., Whitewater.
Dietrich, Edna Louise,	<i>Prairie du Chien</i> , Primary, Public S.
Dixon, W. W.,	<i>Madison</i> ,
Dollar, Jennie,	<i>Berlin</i> , 7th Grade, Public School.
Doran, Mary,	<i>Stoughton</i> , 7th Grade, Public School.
Drissen, William Henry,	<i>Alaska</i> , Prin. Graded School.
Dubois, Nellie,	<i>Appleton</i> ,
Earle, Marshall Delph,	<i>Greenville, S. C.</i> , Prof., Furman Univ.
Edgar, Thomas Oscar,	<i>Madison</i> , Student, U. W.
Elwood, De Witt,	<i>Madison</i> , Prin. H. S., Dodgeville.
Elward, Dorothy,	<i>Madison</i> ,
Emery, Sydney Lawton,	<i>Madison</i> , Student, U. W.
Eply, Francis W.,	<i>West Superior</i> , Ass't Prof., S. N. S.
Ernst, Adolphine,	<i>Watertown</i> , Student, U. W.
Farrell, William James,	<i>Wausau</i> , Prin., Ward School.
Foote, Franc Estelle,	<i>Rochester, N. Y.</i>
Frost, William Dodge,	<i>Madison</i> , Instructor, U. W.
Gabel, Charles Ernst,	<i>Milwaukee</i> .
Gibbons, Julia,	<i>Fond du Lac</i> , 7th Grade, Public School.
Gile, Durant Carlyle,	<i>Madison</i> , Ass't H. S., Poynette.
Gould, Franklin,	<i>Oregon</i> , Prin. High School.
Gregory, Alice G.,	<i>Stoughton</i> , 3rd Grade, Public School.

Grosshuesch, John William,	<i>Franklin,</i>	Inst. Mission House Col.
Guile, Ella May,	<i>Madison,</i>	Ass't, High School.
Hallock, Grace,	<i>Kaukauna,</i>	Director of Kindergarten.
Hambrecht, George Philip,	<i>Grand Rapids,</i>	Sup't of Schools.
Hammill, Walter John,	<i>Jefferson,</i>	Prin. High School.
Hammond, Anna,	<i>Boscobel,</i>	8th Grade, Public School.
Hanson, Louis,	<i>Eau Claire,</i>	
Harrison, Frederick Arthur,	<i>Elkhorn</i>	Student, U. W.
Hart, Nellie M.,	<i>Eau Claire,</i>	Ass't H. S., Mazomanie.
Hatherell, Rosalia A.,	<i>River Falls,</i>	Ass't Prof. S. N. S.
Holmes, Harriet C.,	<i>Beloit,</i>	3rd Grade, Public School.
Hopkins, George Allen,	<i>Madison,</i>	Student, U. W.
Horton, Schuyler C.,	<i>Milwaukee,</i>	Prin., Ward School.
Houlan, Marion Cecilia,	<i>Milwaukee,</i>	6th Grade, Public School.
Howe, Winfred Chester,	<i>Sheboygan,</i>	Student, U. W.
Hurning, Alma,	<i>Spring Green,</i>	
Iwert, Alvin Henry,	<i>Madison,</i>	Student, U. W.
Jamieson, William H.,	<i>Shullsburg,</i>	Ass't High School.
Jefferson, Lorian P.,	<i>De Soto,</i>	Ass't H. S., Viroqua.
Jenks, Albert Ernest,	<i>Kalamazoo, Mich.</i>	
Jones, Lewis Albert,	<i>Georgetown,</i>	Student, U. W.
Jones, Warren Gilbert,	<i>Madison,</i>	Student, U. W.
Kading, Charles A.,	<i>Lowell,</i>	Graded School, Theresa.
Kahu, Rene Robert,	<i>Milwaukee.</i>	
Ketchum, Flora Josephine,	<i>Madison,</i>	Student, U. W.
Kittle, William,	<i>Madison,</i>	Prin., Graded S., Mazomanie.
Knowles, Elizabeth,	<i>Mukwonago,</i>	Gram. G., Menomonee F.
Kuepper, Julia,	<i>Milwaukee,</i>	Teacher of Ger., Private S.
Lachmund, Irma,	<i>Sauk City,</i>	Public School.
Ladd, Myron Clark,	<i>Warren, Ill.,</i>	Sup't of Schools.
Ladd, Minnie,	<i>Warren, Ill.</i>	
Larkin, Andrew L.,	<i>Appleton,</i>	Ass't High School.
Lattimore, Eleanor Larrabee,	<i>Rochester, N. Y.,</i>	Columbia School.
Lea, Watson Clark,	<i>Randolph,</i>	Prin. High School.
Lees, Emma,	<i>Gilman town,</i>	Primary, La Crosse.
Lees, Endora,	<i>La Crosse,</i>	Grammar Grade, Publ. S.
Loomis, Grace,	<i>La Crosse,</i>	Ass't High School.
Lowell, Mrs. F. A.,	<i>Berlin,</i>	
Lowell, Franklin Adams,	<i>Berlin,</i>	Prin. of Schools.
Lowell, Susie Eugenia,	<i>Janesville,</i>	Student, U. W.
McClelland, Robert Avon,	<i>Fayette, Ia.,</i>	Ass't Prof. Upper Ia. Univ.
McClure, Mary Elizabeth,	<i>Mt. Morris, Ill.,</i>	Grammar Grade, P. S.

McGee, Charles A. A.,	<i>Whitefish Bay,</i>	Student, U. W.
McGrath, Edward,	<i>Argyle,</i>	Ass't, High School.
McKitrick, M. May,	<i>Viroqua,</i>	Student, U. W.
McKnight, Margaret,	<i>Berlin,</i>	5th Grade, Public School.
McMillan, Mary Bell,	<i>Centralia,</i>	3rd Grade, Marshfield.
McNish, Ralph Benjamin,	<i>Berlin,</i>	Student, U. W.
Magner, Anna,	<i>St. Peter, Minn.,</i>	8th Grade, Menomonie
Mann, Franklin Harvey,	<i>Shullsburg,</i>	5th Grade, Public S.
Martin, Nellie M.,	<i>Beloit,</i>	
Fitz Maurice, Mary Helen,	<i>Berlin,</i>	Intermediate, Public School.
Mead, Ruth Nettie,	<i>Waterloo.</i>	
Meisnest, Frank William,	<i>Branch,</i>	Student, U. W.
Miller, Grace Elizabeth,	<i>Janesville,</i>	Milton College.
Miller, Maude Evangeline,	<i>Rockford, Ill.</i>	
Mills, Lewis Welling,	<i>Racine,</i>	Student, U. W.
Moore, Ransom Asa,	<i>Madison,</i>	Ass't to Dean Col. Agr. U. W.
Morley, Ralsa Fred,	<i>Madison,</i>	Student, U. W.
Morrissey, Maurice,	<i>Fontana.</i>	
Nugent, Mary,	<i>Fond du Lac,</i>	Prin. Union School.
North, Charles Raymond,	<i>Onalaska,</i>	Student, U. W.
O'Brien, Edwin Thomas,	<i>Eau Claire,</i>	Ass't, H. S., Appleton.
Ochsner, Emma M.,	<i>Prairie du Sac,</i>	7th Grade, Baraboo.
O'Connell, Mary Ella,	<i>Berlin,</i>	Grammar Grade, Public School.
O'Connor, Lenore Frances,	<i>Madison,</i>	Ass't, H. S., Oconomowoc.
Olson, Oscar Alexander,	<i>Chicago, Ill.,</i>	Ass't High School.
Otwell, Allen Meade,	<i>Champaign, Ill.,</i>	Student, U. I.
Patton, Thurlow J.,	<i>Brooklyn,</i>	10th Grade, Public School.
Pearson, Samuel E.,	<i>Madison,</i>	Student, U. W.
Pease, Winnie,	<i>Oregon,</i>	Public School.
Pellow, Laura,	<i>Dodgeville.</i>	
Pitcher, George Churchill,	<i>Albion, Ill.</i>	
Poff, Rose B.,	<i>La Crosse,</i>	Grammar Grade, Pub. S.
Porter, Susan Melvina,	<i>Janesville,</i>	Ass't H. S., Racine.
Potter, Mary A.,	<i>Berlin,</i>	Primary, Public School.
Pratt, Grant E.,	<i>Madison,</i>	Student, U. W.
Pratt, John Alexander,	<i>Prairie duChien,</i>	Prin. High School.
Pray, Allan T.,	<i>Stevens Point,</i>	Ass't H. S., Sheboygan.
Random, Gilbert,	<i>Oshkosh,</i>	Student, U. W.
Ray Samuel B.,	<i>Waukesha,</i>	Prof. Carroll College.
Regan, Katherine Patricia,	<i>Madison,</i>	Student, U. W.
Rehn, Valentine,	<i>Marshall,</i>	Ass't H. S., Avoca.
Reinhard, Hans August,	<i>Milwaukee,</i>	Student, U. W.
Rice, Ole S.,	<i>Madison,</i>	Student, U. W.

Reynolds, Annie,	<i>Jacksonport,</i>	Ass't H. S., Tomahawk.
Rohlinger, Adam F.,	<i>Mayville.</i>	
Roseman, William W. P.,	<i>Mt. Hope,</i>	Prin. H. S., Reedsburg.
Ruschhaupt, Louis Fred,	<i>Milwaukee,</i>	Student, U. W.
Schaefer, Sophie M.,	<i>Appleton,</i>	5th Grade, Public School.
Schreiber, Lucile Howard,	<i>Madison,</i>	Ass't H. S., Bayfield.
Schuster, Otto John,	<i>Pewaukee,</i>	Prin. H. S., Neenah.
Schutzky, Oscar Paul,	<i>Milwaukee.</i>	
Shaw, John Franklin,	<i>Ellsworth,</i>	Co. Sup't.
Seaman, John Thorsen,	<i>Milwaukee.</i>	
Sebell, Emma Rachel,	<i>Indian Ford,</i>	District School.
Shephard, William Henry,	<i>Mt. Hope,</i>	Ass't H. S., Fond du Lac.
Sieker, William Christian,	<i>Manitowoc,</i>	Student, U. W.
Sims, Joseph Thomas,	<i>Mosinee,</i>	Prin., Graded School.
Sleeper, Nettie,	<i>Monticello, Ia.,</i>	Primary, Public School.
Smith, Carrie Josephine,	<i>Fort Atkinson,</i>	Instructor, S. N. S.
Smith, Laura Rountree,	<i>Platteville,</i>	Intermediate Grade, Pub. S.
Stager, John Mickle,	<i>Sterling, Ill.</i>	
Stangel, Charles George,	<i>Tisch Mills,</i>	Student, U. W.
Stelling, Louise Magdalene,	<i>Port Washington,</i>	Ass't H. S., Green B.
Stetson, Dudley Donnelly,	<i>Milwaukee,</i>	Student, U. W.
Stiles, Alevia Eleanor,	<i>Eau Claire,</i>	4th Grade, Public School.
Stowell, Sarah Lillian,	<i>La Crosse,</i>	3rd Grade, Public School.
Summers, Stephen,	<i>Juda.</i>	
Sutherland, William James,	<i>Oregon,</i>	Sup't of Schools.
Swetland, Will Delbert,	<i>Mauston,</i>	Grammar Grade, Public S.
Taylor, Lou,	<i>Kansas City, Kan.,</i>	Primary Grd., P. S.
Taylor, Henry Charles,	<i>Madison.</i>	
Thompson, George,	<i>Moscow,</i>	Student, U. W.
Thompson, James,	<i>Moscow,</i>	Student, U. W.
Torgerson, Martha Floreuce,	<i>Madison,</i>	Ass't H. S., Sturgeon Bay.
Treloar, Delbert,	<i>Waukesha.</i>	
Utendorfer, William Elmer,	<i>Elroy,</i>	Prin. High School.
Vernon, Florence Eugenia,	<i>Madison,</i>	Ass't High School.
Van Vranken, Irene,	<i>Janesville,</i>	5th Grade, Public School.
Walter, Henry Lampert,	<i>Madison,</i>	Student, U. W.
Webster, Thomas,	<i>Elk Grove,</i>	Student, U. W.
Welles, Frances Bradley,	<i>Milwaukee,</i>	Ass't H. S., Fond du Lac.
Whare, George Bartholomew,	<i>Madison,</i>	Student, U. W.
White, Adeline Rawson,	<i>Madison,</i>	Student, U. W.
Wiesender, Emma M.,	<i>Berlin,</i>	Primary Grade, Public School.
Wilder, Ethel May,	<i>Eau Claire,</i>	6th Grade, Public School.

Williams, Will T.,	Oshkosh,	Student, U. W.
Wilkinson, Maud,	Chicago, Ill.	
Winslow, Horatio Gates,	Madison,	Student, H. S.
Winter, Helen,	Madison.	
Woodbury, William W.,	Sandwich, Ill.,	Sup't of Schools.
Wojta, Joseph Frank,	Nero,	Ass't High School.
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SUMMER SCHOOL OF LIBRARY SCIENCE.

Students in 1898.

Babbitt, Grace,	Chicago, Ill.,	State Normal.
Cambell, Gertrude,	St. Cloud, Minn.,	State Normal.
Carpenter, Mary F.,	West Superior, Wis.,	State Normal.
Carr, Lucy F.,	Madison, Wis.	
Chapel, Clara,	Evansville, Wis.,	Public Library.
Earley, Amy M.	Oak Park, Ill.	
Farr, Alice,	Mankato, Minn.,	State Normal.
Hainke, Hulda,	Milwaukee,	Teacher.
Hambright, Florence,	Racine.	
Humphrey, Evelyn,	South Bend, Ind.,	Public Library.
Lewis, Kate,	West Superior.	
McDill, Kate,	Chicago.	
McGraw, Minnie A.,	Mankato, Minn.,	Public Library.
Macpherson, Maud R.,	Ottawa, Canada.	
Mellander, May,	Elgin, Ill.,	High School.
Richardson, Mary P.,	Milwaukee,	Teacher.
Russell, Janet,	Merrill,	Public Library.
Shuler, Mrs. M. P.,	Marshalltown, Ia.,	Public Library.
Skinner, Frances F.,	Evanston, Ill.	
Stone, Walter K.,	Columbia, Mo.,	State University.
Swen, Earl G.,	Cedar Rapids,	Teacher.
Thorne, Gertrude,	Winnetka, Ill.,	Public Library.
Tousley, Bina,	Lake Mills, Wis.,	High School.
Woodward, Katherine,	Oak Park, Ill.	

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Graduates in Residence.....	71
Graduates Studying <i>in absentia</i>	4

COLLEGE OF LETTERS AND SCIENCE—995.

Fellows and Graduates.....	87
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Senior Class—175.

Ancient Classical Course.....	18
Modern Classical Course.....	30
English Course.....	55
Civic Historical Course.....	16
General Science Course.....	36
Philosophical Course.....	20

Junior Class—197.

Ancient Classical Course.....	24
Modern Classical Course.....	30
English Course.....	41
Civic Historical Course.....	26
General Science Course.....	42
Philosophical Course.....	34

Sophomore Class—137.

Ancient Classical Course.....	21
Modern Classical Course.....	18
English Course.....	40
Civic Historical Course.....	33
General Science Course.....	25

COLLEGE OF LETTERS AND SCIENCE—Continued.

Freshman Class—255.

Ancient Classical Course.....	34
Modern Classical Course.....	35
English Course.....	86
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Special Students.....	90
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Fellows and Graduates.....	6
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Senior Class—24.

Civil Engineering Course.....	5
Mechanical Engineering Course.....	6
Electrical Engineering Course.....	13

Junior Class—46.

Civil Engineering Course.....	22
Mechanical Engineering Course.....	12
Electrical Engineering Course.....	12

Sophomore Class—52.

Civil Engineering Course.....	19
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Freshman Class—89.

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TOTAL NUMBER OF STUDENTS.....	1,987
Twice enumerated 64, leaving as actual number.....	1,923

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In former catalogues the category of special students included two classes of students: 1. Students who entered the Freshman class in one course, afterwards transferred to another, and therefore were irregular in their studies, although intending to graduate. 2. Students who entered the Freshman class on the same terms as other students, but who were not candidates for a degree and therefore did not follow the regular course of study. The former class is now included with the regular students and the latter is placed in a separate list. Under the former classification there would be in the 4th year 4 specials; 3d year, 12; 2d year, 33; 1st year, 41; which numbers would have been added to the classes.

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