Catalogue of the University of Wisconsin for 1894-95. 1895

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CATALOGUE

OF THE

University of Wisconsin

FOR

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MADISON, WIS.
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1895


THE
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CALENDAR.

ACADEMIC YEAR, 1894-5.

FALL TERM, September 12—December 22, 14½ weeks.

WINTER TERM, January 7—March 29, 12 weeks.

SPRING TERM opens April 8, closes June 20, 10½ weeks.

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

Theses must be handed in, College of Mechanics and Engineering, June 1.

Theses must be handed in, College of Law, May 15.

Legal Holiday, Wednesday, May 30.

Examination of Candidates for Admission, Thursday and Friday, June 13, 14.

Baccalaureate Address, Sunday, June 16.

Class Day, Monday, June 17.

Address to Law Class, Tuesday, June 18.

Alumni Day, Wednesday, June 19.

COMMENCEMENT, Thursday, June 20, 9 A. M.

SUMMER VACATION, June 21—September 24.

SUMMER SCHOOL opens July 9, closes August 16, six weeks.

ACADEMIC YEAR, 1895-6.

FIRST SEMESTER opens September 25, closes February 8.

Examinations for Admission, Tuesday and Wednesday, September 24 and 25.

Registration Days, September 23—25.

First Recitations, Thursday Morning, September 26.

Legal Holiday, Thanksgiving, November 28.

Christmas Recess, Tuesday, December 24—Thursday, January 2, inclusive.

Examination Week, First Semester, February 3—8.

First Semester closes, Saturday, February 8.

SECOND SEMESTER opens Monday morning, February 10, closes June 25.

Examination Days for Second Semester, Thursday and Friday, February 6, 7.

Legal Holiday, Saturday, February 22.

Easter Recess, Thursday, April 2, Monday, April 6, inclusive.

Legal Holiday, Saturday, May 30.

Examination Week, Second Semester, June 15—20.

Commencement, Thursday, June 25.

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NOYES, GEORGE HENRY, A. B., LL. B., Counselor-at-Law. *Lecturer on Common Carriers.* Milwaukee, Wis.

PECK, S. B., M. E., Consulting Engineer. *Conveying Machinery.* Chicago, Ill.

SHELDON, ANNA RUSSELL, M. A. *University Extension Lecturer on History.* Madison, Wis.

SHOREY, PAUL, Ph. D., Professor of Greek. *The Genesis of Greek and English Poetry.* University of Chicago.

STANTON, THEODORE, A. B. *The Third French Republic.* Paris, France.

SWEET, JOHN E., M. E. *The Modern Steam Engine.* Syracuse, N. Y.

THWAITES, REUBEN GOLD, Secretary of the State Historical Society of Wisconsin. *University Extension Lecturer on History.* Madison, Wis.

WILDER, AMOS P., Ph. D., *University Extension Lecturer on Municipal Government.* Madison, Wis.

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 Washburn Observatory.
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.
VII. The Summer School.

The College of Letters and Science embraces:

A. Graduate Courses.

B. Undergraduate Courses.

Under the Course System.

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 Special Courses for Normal School Graduates.

Under the Group System.

A large number of Courses.

The College of Mechanics and Engineering embraces:

I. The Civil Engineering Course, including Railway, Bridge, Structural, and Highway Engineering.
II. The Mechanical Engineering Course.
III. The Electrical Engineering Course.
IV. Graduate Courses in Engineering.

The College of Agriculture embraces:

I. The Experiment Station.
II. The Graduate Courses.
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 Civic-Historical Course.
II. Graduate Courses, leading to higher degrees.

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. 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, and the School of Music in 1895.

The University of Wisconsin is picturesquely situated at Madison, the capital of the State of Wisconsin. The University grounds comprise 240 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, a tract of ground including 42 acres, and joining the University grounds to the southwest.

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 erected out of the money derived from sales of land granted by the national government. 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, 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 of 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, completed in 1894. Half-way up the slope of University hill, on the south side, is the new 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 President of the University, and the rooms

of the School of Economics, Political Science, and History. 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 is placed the new Horticultural Building, whose erection was authorized by the legislature of 1893; while further west lie the numerous buildings of the Experimental Farm. 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.

GENERAL POLICY.

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 strenuously 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 University recognizes no distinction of race, color, or sex. All who conform to its intellectual and moral requirements are equally entitled to its privileges.

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 their 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 peculiar 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 respon-

sible 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.

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 term to his parent or guardian. The class officers receive all reports from instructors, both those on work completed at the end of the term and special reports of deficiency or failure on the part of individuals.

LIBRARIES.

The General University Library, including the department libraries catalogued therewith, contains over 32,000 books and 8,000 pamphlets. It is open to students every day from 8:45 A. M. to 9:30 P. M., excepting on legal holidays and Sundays. About 200 of the best American and foreign periodicals are taken. In addition there is on deposit the Owen library of works on French literature, numbering about 900 volumes. The College of Law has a special library of 2,300 volumes; and the Washburn Observatory is provided with the Woodman Astronomical Library, now containing 2,200 books and 1,600 pamphlets. Students also have free access to the State Law Library, comprising about 26,000 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 13,000 volumes.

The library of the State Historical Society contains about 100,000 volumes and 69,000 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 the State Papers, the Rolls Series, and other important collections, including works on 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 Seminary of the University has 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.

These library privileges are unsurpassed in the interior, and equalled by very few institutions in the country.

LABORATORIES.

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

First. The Qualitative Laboratory, with accommodations for ninety-six students; *Second.* The Organic Laboratory, accommodating thirty-two students; and, *Third.* The Quantitative Laboratory, accommodating forty-eight students.

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

Of the three special laboratories, one is for Gas-analysis, one for Urinalysis, and one for Toxicology.

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 now 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 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 currents 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 Mineralogical Laboratory has reagents and other necessary apparatus for complete courses in blow-pipe analysis and determinative mineralogy. There is a collection of hand specimens of minerals for laboratory use, and for comparative purposes. The students also have access to the large collections in the cabinet. A small room has been fitted with curtains, to act as a goniometer room, and is supplied with a large reflection goniometer and the complete *Universalapparat* of Fuess.

The mineralogical lecture room is supplied with a complete set of about 150 glass crystal models by F. Thomas, of Siegen, a selected series of wooden crystal models from Kranz, of Bonn; Böhm and Wiedermann's wave-surface and dispersion models; Brill's plaster models of surfaces of elasticity, Werlein's models to show the characters of dispersion in monoclinic crystals; and a series of axis-systems.

The Petrographical Laboratory.—The Petrographical Laboratory contains at present fourteen microscopes, three by Voigt & Hochgesang, seven by Nachet, and four by Fuess, including one large stand by each of the last two. The large Fuess is supplied with an unusually complete set of excellent eye-pieces, objectives, and accessories. The collections of the laboratory are as follows: About 200 sections of minerals, cut in definite directions, 100 of which are Professor Klein's set as prepared by Voigt & Hochgesang; the Stürz set of European rock specimens and thin sections, known as the Rosenbusch collection; a set of American rocks, and thin sections by Julien; and the thin sections of the State Geological Survey. There is also available the very extensive collection of rocks and thin sections from the collection of Pre-Cambrian rocks of North America, belonging to the Lake Superior Division of the United States Geological Survey. This collection is one of the largest of its kind in the world, containing over 10,000 thin sections, and is particularly valuable to advanced students.

The collection of some 1,500 typical crystalline rocks, mostly European, and accompanied by 800 thin sections belonging to the assistant professor in charge of the department, is freely used by students.

The lecture room for geology is provided with a full set of reference manuals; a set of Zittel's Palæontologische 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's 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, including seven microscopes furnished with oil immersion objectives.

The laboratories for advanced work in botany are fitted up with the apparatus and reagents necessary to an advanced course in vegetable histology, and to a course in vegetable physiology. Among the more important pieces of apparatus are Minot microtomes, a Vogel's direct vision spectroscope, a metallic registering thermometer, clinostats, and auxanometers.

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 by Newton & Co., London, over 500 photograms for lantern use, a large number of wall charts, microscope slides, etc.

The Bacteriological Laboratory is situated in Agricultural Hall, and is well equipped with microscopes, sterilizers, thermostats, and

other apparatus for the study of bacteria. These are chiefly from the manufactories of Rohrbeck & Co., and Muencke of Berlin.

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 promising and rapidly progressing science; and to encourage original research.

Considerable apparatus has been purchased abroad and many pieces have been made at the machine shops of the University.

The equipment includes a very complete series of apparatus for the study of the dermal senses; the typical and important instruments for experiments and demonstration in psychological optics; and an unusual variety of apparatus for the study of the time relations of mental phenomena; considerable apparatus designed for statistical research on simple sense and motor tests; a variety of devices for the study of memory, attention, association, and other more complicated processes, and so on. The laboratory has acquired a considerable number of pieces from the section of psychology at the World's Columbian Exposition, including almost the entire working laboratory there exhibited.

Apparatus belonging to other departments is also available for demonstration and other purposes. Original research has been carried on for several years and the more important results have been published in the American Journal of Pyschology.

In addition to the four series of studies there 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.

It is intended to make the laboratory an essential and important feature of the work in psychology.

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

MUSEUMS.

The Geological and Mineralogical Museum.—The museum of the geological and mineralogical departments occupies the entire south wing of the second floor of Science Hall. Systematic collections of typical and impressive specimens have been arranged in glass cases, while the more extensive series for comparative purposes and the working collections are stored in drawers beneath.

Relief Models.—For illustration in general and structural geology the collection embraces large topographico-geological models

of the Colorado Cañon, the Henry Mountains, the Auvergne, the Yosemite Valley, the Uintah Mountains, Mt. Vesuvius, the Leadville Region, Lookout Mountain, etc.

Paleontological Collection.—This embraces a considerable number of Ward and Howell's casts of gigantic fossil forms, including *Megatherium Cuvieri*, *Glyptodon*, the skull and tusks of *Elephas ganesa*, *Dinotherium*, and *Mastodon*, and an unusually good set of Mesozoic reptilian forms. The fossils include a systematic collection, embracing all geological horizons, obtained by purchase, and the *Powers Collection*, the generous gift of Mr. H. C. Powers, of Chicago. This latter collection is especially rich in fossils of the Trenton and other Silurian deposits of Wisconsin.

The collection of the Wisconsin Academy of Science, which contains the type specimens described in the official reports of the last State Geological Survey, is deposited in the museum and is accessible to students.

The Mineral Collection.—The systematic collection of minerals contains 2,500 to 3,000 specimens, representing the different groups and containing many rare specimens. With a view to the impressive illustration of mineralogical types, the larger and many of the smaller but choice specimens have been displayed in glass cases.

The Henry Collection of Minerals.—The University Museum contains the W. T. Henry collection, consisting of from 30,000 to 40,000 specimens. It is especially representative of the lead and zinc ore deposits of southwestern Wisconsin and adjoining states, and is exceptionally complete in its exhibition of the various forms of ore, of the order of deposition, and of the pseudomorphic changes that have taken place in the original deposits. Crystallographically the collection is valuable from the specimens of calcite, cerusite, azurite, galena, and sphalerite. The large number of duplicates specimens will be utilized in enlarging the collection by exchanges.

Rock Collection.—The rock collections embrace Stürz's Rosenbusch collection of typical European rocks, and the Julien collection of typical American rocks, as well as a considerable collection obtained from other sources.

Metallurgical Collection.—A small collection, illustrating the metallurgy of the different metals, contains specimens representing the ores of each, and the products of the different reducing processes. This collection has been augmented by accessions obtained from the exhibitors at the World's Columbian Exhibition of 1893.

The Zoological and Botanical Museum occupies the entire third story of the south wing of Science Hall, directly above the geolog-

ical 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 alcholic 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 recently 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. The first large addition in this direction has been through the presentation by Mr. L. S. Cheney of his private collection. Mr. Lapham's collection also included a considerable number of algæ, lichens, and mosses. The collection of mosses has now been very greatly extended, so that it includes almost all of the species known in North America, and a large number of those of other countries. Many valuable sets of exsiccati are included.

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, a filar micrometer, 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 stu-

dents of the first two years' attendance. The lower campus, a level area, furnishes space for base-ball, foot-ball, and other physical sports. Tennis courts are also 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 at a cost of over $4,000.

Armory and Gymnasium.

Through the liberal appropriation made by the legislature of 1891, means were provided for the construction of a new Armory and Gymnasium of the most approved order. The building is two hundred feet in length, ninety-eight feet in width, and three stories in height. On the ground floor there are ample accommodations for bathing, including a swimming tank eighty feet in length by twenty-eight in width, a room for squad and company drill, lockers for six hundred students, four bowling alleys, and room for the practice of the minor gymnastics. On the main floor, besides the necessary offices, there is an unobstructed hall one hundred and sixty-two by ninety-three feet in dimensions, for the purposes of military drill and gymnastic practice. On the third floor are two rifle ranges, a running track, a base-ball cage one hundred and sixty feet in length, and two rooms of the same length for rowing machines and similar apparatus.

Gymnastics for Women.

Systematic courses in gymnastics for women are maintained in Ladies' Hall under the immediate direction of a trained instructor, a graduate of Anderson's Gymnasium, New Haven, and under the general supervision of a thoroughly educated physician.

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 the 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.

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, Mining and Metallurgical Engineering, Electrical Engineering.

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 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 a subsequent page.

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.

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.

UNIVERSITY EXTENSION.

The object of University Extension is to furnish to those who are unable to go to the universities as much as possible of the knowledge and inspiration developed in the University. It offers no equivalent for regular University study, in which there is a place element and a time element for which no substitutes can be found in University Extension. But to those people who read and think and who are unable to attend the University, University Extension offers at their homes the means of guidance in reading and an inspiration for thought, which are afforded in no other way. The University of Wisconsin was the first institution in the Northwest to enter upon the work of University Extension, and it has continued the work vigorously from its inception. For the year 1894-5 thirty-one courses of University Extension lectures were offered. The plan of each course is as follows : First, a printed syllabus of the course is given free to each student, containing an epitome of the subject, an analysis of each lecture, references to the best books for collateral reading, and other helpful suggestions. Second, the lecturer discusses the subjects in the order and on the lines laid down by the syllabus so that the student may prepare himself for a more intelligent hearing on the subject. Third, after the lecture a class is held which offers to the student an opportunity to question the lecturer and to have special difficulties explained. In this class there is a free discussion of the whole subject, and in it we find that personal contact between lecturer and student which enables the lecturer to communicate something of the real University spirit and method.

In some courses an extra class has been organized for special reading, demonstration, or study under the direction of the lecturer. This method will be followed whenever the nature of the subject renders it advisable and the time at the disposal of the lecturer permits the additional work. Fourth, a series of questions is ordinarily given out to students at each lecture, to which answers are returned in writing. Fifth, at the end of the course is held 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 examinations, the University of Wisconsin will

award a certificate, having the value on the University records of a one-fifth study for one term, and credited accordingly, should the holder ever study at the University.

The lecturer's fee for a course of six lectures is ninety dollars. The Center must also meet his traveling expenses. The latter sum will vary greatly, according to the distance of the Center from the University, and the need of sleeping car and meals while on the journey. Railway fares may be estimated at two cents per mile. Centers at a distance from Madison can save a considerable sum of money by combining into circuits. The Center must also bear the cost of hall, lights, printing, advertising, etc. Various methods have been employed by the local organizations to meet the expenses of the course. In most cases a moderate fee was charged, and this, with few exceptions, is found sufficient to meet the entire expenses, and in most instances some residue remains.

The following is the programme of courses for 1894–95:

Professor J. W. Stearns: The History of Ethics; Æsthetics.

Professor J. C. Freeman: English Literature; Six Studies in Shakespeare.

Mr. J. F. A. Pyre: English Poets and the French Revolution.

Mr. William B. Cairns: The Development of American Literature.

Professor Julius E. Olson: Early Scandinavian History and Literature.

Professor Charles F. Smith: Greek Life.

Professor Alexander Kerr: Greek Literature.

Professor Frederick J. Turner: The Colonization of North America; History of the United States.

Professor Victor Coffin: Political History of Europe in the Nineteenth Century, with Special Reference to Practical European Politics; The French Revolution.

Mr. Reuben G. Thwaites, Secretary of the State Historical Society: The Making of Wisconsin.

Mrs. Anna R. Sheldon: Early and Mediæval England; England of the Tudors and Stuarts, 1500–1689; Modern England, 1689–1885.

Professor Richard T. Ely: Socialism; Distribution of Wealth.

Professor John B. Parkinson: The English Constitution; Practical Questions in Economics.

Professor William A. Scott: Economic Problems of the Present Day; Money and Credit.

Mr. Charles J. Bullock: Public Finance.

Mr. Amos P. Wilder: The Municipal Problems.

Mr. George W. Saunderson: Elocution and Oratory; Interpretative Readings from the Modern Poets.

Professor Charles R. Barnes: Modern Views of Plant Life.

Professor Homer W. Hillyer: Chemistry.
Professor George C. Comstock: Astronomy.
Professor Harry L. Russell: General Course in Bacteriology.

Courses were given during the year 1893–4 at the following places: Milwaukee, Oshkosh, three each; Galesburg, Ill., Green Bay, La Crosse, Lancaster, Sparta, Stevens Point, Winona, Minn., two each; and one each at Antigo, Appleton, Cincinnati, O., Baraboo, Eau Claire, Elroy, Fox Lake, Hudson, Jefferson, Kaukauna, Kenosha, Menomonie, Merrill, Prairie du Chien, Racine, River Falls, Rockford, Ill., Sturgeon Bay, Waupaca, Waupun, Wausau.

Besides these regular courses of University Extension lectures, Mrs. Anna R. Sheldon conducted study classes for women in the History of the Middle Ages, France, and England.

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., 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., Professor of Philosophy and Pedagogy.
B. W. Snow, Ph. D., Professor of Physics.
C. A. Van Velzer, Ph. D., Professor of Mathematics.

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. It is the purpose of the University to continue the rapid progress of the past few years in this respect. Personal assistance is rendered by professors to graduates according to individual needs. Classes for advanced students are organized and seminaries are conducted in which original research may be carried on.

The advanced studies of the various departments lead to graduate study. 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. By the Group System the undergraduate student is enabled to concentrate work upon a leading line of study for several years, whereby in his senior year he is enabled to do advanced work in certain classes designed for graduates and undergraduates.

Graduates from this University, or 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 specifically 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 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. The sexes 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 fel-

low 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 for 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 the 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 is a graduate of at least one year's standing.

PHARMACEUTICAL FELLOWSHIP.

Through the generosity of friends of the School of Pharmacy, funds have been provided for a fellowship in pharmacy for three years. This fellowship is at present held by Mr. Carl G. Hunkel, Ph. G.

UNIVERSITY SCHOLARSHIPS.

University scholarships, similar in aim to the fellowships, have been in recent years provided for graduates in the School of Economics, Political Science, and History. At the present time they are three in number: a Woman's Scholarship, and two Social Science Scholarships. The former yields $150 per annum, and the latter

enough to defray the expenses of those who hold them while practically engaged in charitable and correctional work during the summer months.

UNIVERSITY PUBLICATIONS.

There are several series of publications issued by the University and published by the State under authority of law. From the Washburn Observatory there are issued the publications of the Washburn Observatory, of which there have thus far appeared eight volumes. From the College of Agriculture there are issued the Quarterly Bulletins, of which thus far forty-three have appeared; the Annual Reports, now numbering eleven; and the Bulletin of the Farmers' Institutes, of which seven numbers have appeared.

Besides these the University issues four series of publications, known as Bulletins of the University of Wisconsin, of which the first number appeared in May, 1894. These are issued in four series, namely:

1. Engineering Series, of which four numbers have appeared: Track, by L. F. Loree; Practical Hints in Dynamo Design, by Gilbert Wilkes; The Steel Construction of Buildings, by C. T. Purdy; The Evolution of a Switch Board, by A. V. Abbott.
2. Bulletins of the Series in Economics, Political Science, and History. Of these the first has appeared On the Geographical Distribution of the Vote of the Thirteen States on the Federal Constitutions, 1787–8, by Orin G. Libby, Fellow in History. In this series there is in press a bulletin by C. J. Bullock, Fellow in Economics, On the Finances of the United States from 1775 to 1789, with special Reference to the Budget.
3. Bulletins of the Science Series: Two have thus far appeared: No. 1, On the Speed of the Liberation of Iodine in Mixed Solutions of Potassium Chlorate, Potassium Iodide, and Hydrochloric Acid, by Herman Schlundt, Assistant in Chemistry. No. 2. On the Quartz Keratophyre and Associated Rocks of the North Range of the Baraboo Bluffs, by S. Weidman. The third bulletin of this series is in press; entitled Chapters in Spherical and Practical Astronomy, by G. C. Comstock, Director of the Washburn Observatory.
4. Bulletins of the Series in Philology and Literature. No number of this series has as yet appeared.

The University thus makes ample provision for the publication of original work in investigation done by members of the Faculty or by advanced students. In addition to these publications of the University, there are published the Proceedings of the State Historical Society, and the Transactions of the Wisconsin Academy of Sciences, Arts, and Letters, in which may appear the results of investigation in lines indicated by the names of the Societies.

HIGHER DEGREES.

SECOND DEGREES.

The degrees of Master of Arts, Master of Letters, and Master of Science are conferred upon graduates of the University who have previously taken the degrees of Bachelor of Arts, Bachelor of Letters, and Bachelor of Science, respectively, and who, after graduation, have pursued 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. This work may be done at the University or elsewhere, but if it is not done at the University, or in connection with some institution of high rank, it will be assumed that a longer time and a larger nominal amount of study will be requisite to give the equivalent attainment, and the degree will not be conferred until three years after graduation. 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 of the Faculty having the subject in charge. 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 is required before 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 on 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 by 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 present suitable evidence of three years of professional work, of which one must be 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, on conditions similar to those required for second degrees in the College of Letters and Science.

The University offers its higher degrees to graduates of other colleges of high standing who shall reside at the University and pursue the requisite studies under the immediate direction of the Faculty.

THIRD DEGREES.

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 chosen with the approval of the proper committee of the Faculty as early as 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 appropriate committee of the Faculty 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 twenty-five copies of the same in the Library of the University.

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 in 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. A brief reference is given here to these courses to enable a student to form some idea of the range and extent of graduate work.

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.

COLLEGE OF LETTERS AND SCIENCE.

Philosophy.

Professor Stearns: Course 7, History of Philosophy; Course 8, The Philosophy of Lotze; Course 9, The Philosophy of Modern Science.

Professor Jastrow: Course 2, Experimental Psychology; Course 4, Comparative Psychology; Course 5, Abnormal Psychology; Course 6, Anthropological Psychology; Course 17, Advanced Logic; Course 3, Advanced Experimental Psychology.

Dr. Sharp: Course 11, Readings in German Philosophy; Course 10, The Theory of Cognition.

The Philosophical Seminary, conducted by all the instructors in the department, is open to graduates and undergraduates of suitable attainments.

Pedagogy.

Professor Stearns: Course 2, School Supervision; Course 4, The Herbartian Pedagogy; Course 6, Problems in Applied Psychology.

In the School of Economics, Political Science, and History the following courses are offered :

Economics.

Professor Ely : Course 6, the Distribution of Wealth ; Course 7, History of Economic Thought ; Course 11, Public Finance ; Course 12, American Public Finance.

Associate Professor Scott : Course 8, Theories of Value ; Course 9, Theories of Rent, Wages, Profit and Interest; Course 10, Theories of Production and Consumption.

Professors Ely and Scott: Economic Seminary. For 1895 the subject will be the English Socialists and the German Socialists.

Sociology.

Dr. Sharp: Course 6, Readings in German Social Philosophy.

Public Administration.

Three courses are offered on Principles of Administration; Municipal Organization and Municipal Government.

Political Science.

Professor Parkinson: Course 4, Comparative Constitutional Law; Course 7, Political Science Seminary.

History.

Professor Turner: Course 7, Economic and Social History of the United States; Course 11, Constitutional and Political History of the United States, Colonial Period to War of 1812 (1896-97); Course 12, Constitutional and Political History of the United States from the close of the War of 1812.

Professor Haskins: Course 8, Constitutional History of England; Course 9, History of Institutions, Greek and Roman (1896-97); Course 10, History of Institutions, Later Roman, Mediæval and Modern.

Assistant Professor Coffin: Course 13, Advanced Modern European History.

Seminary work in History for graduates is conducted by all of the professors.

Greek.

Professor Smith: Course 10, Greek Seminary, devoted next year to the study of Thucydides. The subject of the seminary changes from year to year. Professor Smith and Professor Kerr: Course 11, State Antiquities.

Assistant Professor Laird; Course 12, Comparative Greek Grammar; Course 4, Sanscrit.

Latin.

Professor Hendrickson: Course 7, History of Roman Literature; Course 9, Latin Seminary, first semester, the earliest monuments of Literary Criticism at Rome; second semester, the Ars Poetica of Horace. The subject of the Latin Seminary changes from year to year.

Professor Hendrickson and Assistant Professor Laird; Course 8, (Comparative Philology) Latin Grammar and Syntax (1896-97).

Hebrew.

Professor Williams: Graduate courses in Hebrew and Hellenistic Greek.

German.

Professor Rosenstengel: Course 6, Faust; The History of German Literature; Course 21, Seminary, for those intending to become teachers of German.

Assistant Professor Wilkens: Course 14, Middle High German, Old High German and Gothic; Course 15, Philologic Seminary,

French.

Professor Owen: Course 8, The Principles of Language.

Miss Gay: Course 10, Philology of the Oldest French Literature.

Mr. Giese: Course 9, French Literature XVI-XIX Centuries.

Scandinavian.

Professor Olson: Course 4, Old Norse or Icelandic.

English.

Professor Freeman: Course 12, Shakespeare; Course 19, English Literature Seminary, given in 1895-96 to Carlyle, Ruskin, Arnold, and Newman.

Assistant Professor Hubbard: Course 3, Beowulf; Course 5, Philology Seminary.

Mathematics.

Professor Van Velzer: Course 8, Advanced Calculus; Course 9, Differential Equations; Course 11, Analytic Geometry of Two Dimensions; Course 15, Analytic Geometry of Three Dimensions; Course 20, Modern Algebra.

Professor Slichter: Course 18, Partial Differential Equations of Mathematical Physics. Course 19, Hydrodynamics.

Mr. Skinner: Course 10, Higher Trigonometry; Course 16, Quaternions.

Dr. Van Vleck: Course 17, Theory of Functions.

Chemistry.

Professor Daniells: Advanced Inorganic Chemistry.

Assistant Professor Hillyer and Dr. Saunders: Advanced Organic Chemistry.

Physics.

Professor Snow, Professor Davies, Dr. Austin, and Dr. Thwing: Course 11, Graduate Study in Theoretical and Practical Physics.

Professor Davies: Course 8, Mathematical Theory of Sound;

Course 9, Mathematical Theory of Electricity; Course 10, Mathematical Physics.

Dr. Austin: Course 7, Introduction to Mathematical Physics.

Astronomy.

Professor Comstock offers at the Washburn Observatory abundant facilities for research work.

Geology.

Professor Van Hise: Course 5, Physical Geology and Pre-Cambrian Geology.

Assistant Professor Clements: Course 5, Paleontology.

Assistant Professor Hobbs: Course 5, Advanced Petrology.

Biology.

Professor Birge: Course 10, Advanced Invertebrate Zoology, and special work in the investigation of lake life.

Professor Barnes: Course 17, Vegetable Organogeny and Embryology: Course 18, Vegetable Physiology: Course 19, Bryology.

Assistant Professor Russell: Course 24, Advanced Bacteriology.

Dr. Miller: Course 8, Advanced Histology.

Dr. Marshall: Course 9, Invertebrate Embryology; Course 10, with Professor Birge.

Opportunity for research work is offered in the Summer School.

COLLEGE OF MECHANICS AND ENGINEERING.

The laboratories of the College of Mechanics and Engineering are well equipped for special advanced investigation in industrial branches, and encouragement is given to students of the College who desire to do work of research. For a description of the special engineering laboratory equipments, see later pages of the catalogue.

The following lecture and laboratory courses are offered to graduate students:

Pure and Applied Mechanics.

Assistant Professor Maurer: Course 6, Graphics.

Assistant Professor Richter: Course 7, Testing Materials.

Topographical and Geodetic Engineering.

Mr. Smith: Courses 6 and 7, Advanced Geodesy.

Railway Engineering.

Professor Whitney: Course 5, Railway Standards.

Municipal Engineering.

Professor Turneaure: Course 3, Design of Water Supply and Sewerage Systems.

Professor Whitney: Course 4, Roads and Pavements; Course 5, Office Management and Records.

Steam Engineering.

Professor Bull: Course 8, Advanced Design.

Assistant Professor Richter: Course 9, Advanced Laboratory Work.

Electrical Engineering.

Professor Jackson: Course 4, with an advanced course in Alternating Currents; Course 5, Electric Light and Transmission of Power.

Assistant Professor Fortenbaugh: Course 2b, Electrolysis; Course 6a, Electric Railways.

Course 8, Special Reading and Research, is offered jointly by Professors Jackson and Fortenbaugh. Courses offered in Physics and Mathematics by Professor Davies, Professor Slichter, Dr. Austin, or Dr. Thwing, may be advantageously taken in connection with Course 8.

Structural Engineering.

Professor Turneaure: Course 7c, Swing Bridges; Course 8, Bridge Specifications and Construction.

Machine Design.

Professor Jones: Course 6, Advanced Designing.

COLLEGE OF AGRICULTURE.

In the College of Agriculture research work is offered to graduates and undergraduates of suitable preparation in all the lines of study carried on at the Experiment Station. Work is constantly in progress in the various directions of Animal Husbandry, Dairy Husbandry, Agricultural Chemistry, Soil Physics, Bacteriology, and Horticulture, and ample opportunities are offered for students desiring to take part in these investigations or to carry on other studies along similar lines.

SCHOOL OF PHARMACY.

Professor Kremers: Course 6, Non-nutritive Plant Constituents; Course 7, Graduate Work in Pharmaceutical Chemistry; Course 8, Pharmaceutical Seminary.

EXPENSES.

The expenses for graduate students are the same as those for undergraduates. In the College of Letters and Science the tuition for students not residents of Wisconsin is $15.00 per semester. The general incidental fee is $10.00 per semester. In the College of Mechanics and Engineering these charges are $15.00 and $20.00 respectively; in the College of Agriculture $9.00 and $6.00; in the School of Pharmacy, $15.00 and $20.00. 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 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 in the College of Letters and Science.

COLLEGE OF LETTERS AND SCIENCE.

CORPS OF INSTRUCTION.

C. K. Adams, LL. D., President of the University.
E. A. Birge, Ph. D., Dean and Professor of Zoology.
C. R. Barnes, Ph. D., Professor of Botany.
E. Chynoweth, Professor of Military Science and Tactics.
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.
W. W. Daniells, M. S., Professor of Chemistry.
J. E. Davies, A. M., M. D., LL. D., Professor of Electricity and Magnetism and Mathematical Physics.
J. C. Elsom, M. D., Professor of Physical Culture.
R. T. Ely, Ph. D., LL. D., Professor of Political Economy.
D. B. Frankenburger, A. M., Professor of Rhetoric and Oratory.
J. C. Freeman, LL. D., Professor of English Literature.
Almah J. Frisby, B. S., M. D., Preceptress and Professor of Hygiene.
C. H. Haskins, Ph. D., Professor of European History.
G. L. Hendrickson, B. A., Professor of Latin.
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., Assistant Professor of English Literature.
Joseph Jastrow, Ph. D., Professor of Experimental and Comparative Psychology.
Alexander Kerr, A. M., Professor of the Greek Language and Literatures.
A. A. Knowlton, A. M., Assistant Professor of Rhetoric.
A. G. Laird, Ph. D., Assistant Professor of Ancient Languages.
J. E. Olson, B. L., Professor of Scandinavian Languages and Literature.
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., Assistant Professor of Bacteriology.
W. A. Scott, Ph. D., Associate Professor of Political Economy.
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 in Latin.
J. W. Stearns, LL. D., Professor of Philosophy and Pedagogy.
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.
F. H. Wilkens, Ph. D., Assistant Professor of German Philology.
W. H. Williams, A. B., Professor of Hebrew and Hellenistic Greek.
L. W. Austin, Ph. D., Instructor in Physics.
Pauline M. Bauer, Instructor in Gymnastics.
W. B. Cairns, A. M., Instructor in Rhetoric.
L. S. Cheney, B. S., Instructor in General and Pharmaceutical Botany.
H. H. Everett, Instructor in Gymnastics.
Lucy M. Gay, B. L., Instructor in French.
W. F. Giese, A. M., Instructor in Romance Languages.
W. S. Marshall, Ph. D., Instructor in Biology.
W. S. Miller, M. D., Instructor in Vertebrate Anatomy.
J. F. A. Pyre, B. L., Instructor in English Literature.
Harriet T. Remington, M. L., Instructor in German.
A. P. Saunders, Ph. D., Instructor in Chemistry.
G. W. Saunderson, A. M., LL. B., Instructor in Elocution.
H. Schlundt, B. S., Assistant in Chemistry.
F. C. Sharp, Ph. D., Instructor in Philosophy.
W. G. Sired, Instructor in Music.
E. B. Skinner, A. B., Instructor in Mathematics.
Susan A. Sterling, B. L., Instructor in German.
C. B. Thwing, Ph. D., Instructor in Physics.
E. B. Van Vleck, Ph. D., Instructor in Mathematics.

ADMISSION TO THE FRESHMAN CLASS OF THE UNIVERSITY.

There are two methods of admission to the University.

I. By examination at the University.

II. By certificates from accredited schools.

The University withdraws the privilege of local examinations, as that method of admission does not seem to meet any considerable want.

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 doubt 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 13th and 14th, beginning at 9 o'clock A. M. The later examinations will be held on Tuesday and Wednesday, September 24th and 25th, 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 6 and 7, 1896.

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: Montgomery's 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.

1. For General Reading and Composition Work.

1895—Shakespeare's Twelfth Night, The Sir Roger de Coverley Papers in The Spectator, Irving's Sketch Book, Scott's Abbot, Webster's First Bunker Hill Oration, Macaulay's Essay on Milton, Longfellow's Evangeline.

1896—Shakespeare's A Midsummer Night's Dream, Defoe's History of the Plague in London, Irving's Tales of a Traveller, Scott's Woodstock, Macaulay's Essay on Milton, Longfellow's Evangeline, George Eliot's Silas Marner.

1897—Shakespeare's As You Like It, Defoe's History of the Plague in London, Irving's Tales of a Traveller, Hawthorne's Twice Told Tales, Longfellow's Evangeline, George Eliot's Silas Marner.

1898—Milton's Paradise Lost, Books I. and II.; Pope's Iliad, Books I. and XXII.; The Sir Roger de Coverley Papers in The Spectator, Goldsmith's The Vicar of Wakefield, Coleridge's Ancient Mariner, Southey's Life of Nelson, Carlyle's Essay on Burns, Lowell's Vision of Sir Launfal, Hawthorne's The House of the Seven Gables.

2. For thorough Study:

1895—Shakespeare's The Merchant of Venice, Milton's L'Allegro, Il Penseroso, Comus and Lycidas, Macaulay's Essay on Addison.

1896—Shakespeare's The Merchant of Venice, Milton's L'Allegro, Il Penseroso, Comus and Lycidas, Webster's First Bunker Hill Oration.

1897—Shakespeare's The Merchant of Venice, Burke's Speech on Conciliation With America, Scott's Marmion, Macaulay's Life of Samuel Johnson.

1898—Shakespeare's Macbeth, Burke's Speech on Conciliation With America, De Quincey's The Flight of a Tartar Tribe, Tennyson's The Princess.

h. English Grammar. There is included in the requirement for entrance a knowledge of the leading facts of English Grammar, and proper 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); Cæsar, four books or an equivalent amount of Nepos, Cæsar (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 Cæsar 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 Xenophon's prose; 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, the essentials of grammar (Collar-Eysenbach's, Joynes-Meissner's, Whitney's, or an equivalent), and the ability to apply them (two terms' work); 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 9 to 12 German poems (two terms' work), and the careful study of at least two plays, as Minna von Barnhelm, Der Neffe als Onkel, or Die Journalisten (two terms' work).

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, and to all the Courses in Engineering.*

a. The studies named in Group I.

b. **German** as stated in Group III., d, or an equivalent amount of French.

c. **Physics:** Gage or Avery, with laboratory work.

d. **Physiology:** Martin's The Human Body (briefer course).

e. **Botany:** Gray's Lessons, with plant analysis and description.

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.

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 to the Elementary Greek Class.

As Greek is given in but few high schools, a special concession is made to those who wish to take the Ancient Classical Course in the University. An Elementary Greek Class is provided, for admission to which Greek will not be required. In Latin, four books of Cæsar and four orations of Cicero will be required. Otherwise the requirements will be the same as for the Ancient Classical

Course. This preparation may be secured by taking the Modern Classical Course recommended by the State Superintendent through the first three years, substituting geometry in the place of German in the third year. Students who thus take the elementary Greek in the University must expect to take five years for completing the Ancient Classical 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 inspection. 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 examination should in all cases be invited. The necessary expenses attending the visit of the examining committee are met by the school under inspection.

Principals of accredited schools are requested to note the statements regarding English, German, Latin, and adaptive work under Terms of Admission, and their attention is directed especially to the new requirements for admission to the Civic-Historical Course which go into effect at the opening of the next academic year.

ACCREDITED SCHOOLS

For All Courses.

School.	Principal.
Ashland,	F. H. Miller.
Austin (Ill.),	B. F. Buck.
Beaver Dam: Wayland Academy,	H. M. Burchard.
Beloit,	A. F. Rote.
Chicago High Schools,	A. G. Lane.
Chciago: Harvard School,	J. J. Schobinger, J. C. Grant.
Detroit (Mich.): School for Boys,	Frederick Whitton.
Faribault (Minn.): Shattuck School,	James Dobbin.
Fond du Lac,	L. A. Williams.
Fox Lake: Downer College,	Ellen C. Sabin.
La Crosse,	Albert Hardy.
Madison,	J. H. Hutchinson.
Madison: Wisconsin Academy,	Charlotte E. Richmond.
Marinette,	J. T. Edwards.
Milwaukee: East Side,	A. J. Rogers.
Milwaukee: South Side,	S. A. Hooper.
Milwaukee Academy,	Julius H. Pratt, Jr.
Oshkosh,	R. H. Halsey.
Racine College,	Arthur Piper.
Rockford (Ill.),	Walter A. Edwards.
Waukesha: Carroll College,	W. L. Rankin.

For Modern Classical, Civic-Historical, General Science, English, Engineering, Pharmacy, and Agricultural Courses.

School.	Principal.
Appleton: Ryan High School,	F. E. McGovern.
Baraboo,	J. E. NeCollins.
Beaver Dam,	H. B. Hubbell.
Brodhead,	R. W. Pringle.
Burlington,	A. Corstvet.
Chicago: Kenwood Institute,	Anna E. Butts.
Chippewa Falls,	R. L. Barton.
Columbus,	M. H. Jackson.
Darlington,	J. T. Hooper.
Decorah (Iowa),	C. A. King.
Delavan,	C. W. Rittenburg.
De Pere,	Violet M. Alden.
Eau Claire,	M. S. Frawley.
Elkhorn,	C. D. Kipp.
Evansville Seminary,	C. N. Bertels.
Fond du Lac: Grafton Hall,	B. Talbot Rogers.
Fort Atkinson,	A. W. Weber.
Freeport (Ill.),	W. D. Hawk.
Green Bay,	W. O. Brown.
Hillside Home School,	Ellen C. Lloyd Jones, Jane Lloyd Jones.
Janesville,	D. D. Mayne.
Lake Geneva,	A. F. Bartlett.
Lancaster,	L. L. Clarke.
Manitowoc: North Side,	H. J. Evans.
Menomonie,	J. E. Hoyt.
Monroe,	W. C. Lea.
Neenah,	J. F. Conant.
Racine,	A. J. Volland.
River Falls,	H. L. Wilson.
Sheboygan,	J. E. Riordan.
Stevens Point,	H. A. Simonds.
Superior: West End,	W. T. Langley.
Waupaca,	F. E. Doty.
Wauwatosa,	Mary C. Warne.
West De Pere,	C. C. Parlin.
Whitewater,	E. W. Walker.

For Modern Classical, Civic-Historical, General Science, Engineering, Pharmacy, and Agricultural Courses.

Evansville,	E. E. DeCou.
Prescott,	James Goldsworthy.

School.	Principal.
Sparta,	J. W. Livingston.
Tomah,	G. W. Reigle.
Viroqua,	Taylor Frye.
Watertown,	C. F. Viebahn.

For Civic-Historical, English, Pharmacy, and Agricultural Courses.

Waukesha,	H. L. Terry.

For General Science, English, Engineering, Pharmacy, and Agricultural Courses.

Appleton: Third Ward,	W. F. Winsey.
Black River Falls,	J. H. Derse.
Boscobel,	F. W. Meisnest.
Centralia,	H. D. Kneip.
Cumberland,	A. E. Brainerd.
Dodgeville,	George Beck.
Edgerton,	H. A. Adrian.
Fort Howard,	A. W. Burton.
Fox Lake,	R. E. Rienow.
Grand Rapids,	W. H. Luehr.
Hudson,	E. P. Frost.
Kenosha,	E. C. Wiswall.
Lodi,	R. E. Loveland.
Mayville,	L. S. Keeley.
Mazomanie,	E. E. Campbell.
Menasha,	A. B. Dunlap.
Neillsville,	W. L. Morrison.
New London,	J. C. Freehoff.
Oconomowoc,	O. J. Schuster.
Prairie du Chien,	M. N. McIver.
Prairie du Sac,	J. F. Bergen.
Ripon,	A. E. Schaub.
Sauk City,	W. H. Schulz.
Stoughton Academy,	K. A. Kasberg.
Wausau,	Karl Mathie.
West Bend,	L. E. Amidon.

For General Science, Engineering, Pharmacy, and Agricultural Courses.

Mauston,	A. H. Fletcher.
Medford,	B. F. Oltman.
Mineral Point,	A. R. Jolley.
Portage,	W. G. Clough.
Sheboygan Falls,	F. F. Showers.

For English, Agricultural, and Pharmacy Courses.

School.	Principal.
Arcadia,	G. O. Banting.
Chippewa Falls: Notre Dame School,	M. F. Xavier.
Durand,	J. W. Nesbit.
Elroy,	H. B. Lathe.
Hartford,	E. W. Pryor.
Horicon,	E. T. Johnson.
Jefferson,	G. W. Gehrand.
Kewaunee,	M. McMahon.
Lake Mills,	A. B. West.
Merrill,	Anna E. Anderson.
Necedah,	C. H. Maxson.
New Lisbon,	S. A. Bostwick.
New Richmond,	J. W. T. Ames.
Oregon,	H. M. Haskell.
Reedsburg,	W. N. Parker.
Richland Center,	Philip Eden.
Sharon,	J. G. Skeels.
Shawano,	D. O. Williams.
Sinsinawa: St. Clara's Academy,	The Dominican Sisters.
Spring Green,	J. D. Rouse.
Stoughton,	A. H. Sholtz.
Sturgeon Bay,	E. E. Beckwith.
Sun Prairie,	James Melville.
Washburn,	H. W. Rood.
Waupun: South Ward,	F. C. Howard.

GRADUATES OF THE STATE NORMAL SCHOOLS.

Graduates of the advanced courses of the State Normal Schools will be admitted to the University with the rank of Juniors in the English and General Science courses. A special adaptation of these courses has been framed for the purpose of enabling such graduates to utilize as advantageously as practicable their previous training.

These courses are presented on a subsequent page, and the attention of the normal school graduates is invited to them.

The certified standing of any student in the regular courses of the normal schools of this State will be accepted in the studies which it covers in place of an examination.

Change in Terms of Admission of Normal Graduates.

The University began to admit Normal Graduates to the Junior class of the English and General Science courses in the year 1887. Since that time the terms of admission to these courses have been

materially raised, and more recently the demands on students for advanced work have been increased by the requirement of a graduating thesis. The Group System of study has also been introduced and opportunities for advanced work in all departments have been greatly enlarged. The thesis, as elsewhere described, must be on a subject in which the student has already reached advanced attainments; and the Group System is practicable only in case of preliminary work adapted to the advanced special studies of the Junior and Senior years. To these new requirements of the University the Normal School Courses, necessarily largely professional in their nature, do not seem to be very perfectly adapted. In view of this fact it is not improbable that a change in the conditions of admission of Normal School Graduates may be thought necessary in the near future. The authorities of the University, however, desire to proceed in this matter with a full appreciation of the fact that the school system of the State is in some sense an organic whole, and that all questions involving two important departments of education should be treated from a general rather than a special point of view. It is hoped that a friendly conference between the authorities of the University, and those of the Normal Schools may result in satisfactory modifications. No changes in the terms of admission will go into effect until due announcement has been made.

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 certificates of creditable standing and honorable dismission. 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 of reasonable ground for doubt, the University reserves the right to test the value of such records by actual examination.

No person will be admitted to advanced standing 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—GENERAL CHARGES.

All fees are required to be paid strictly in advance at the beginning of each semester.

College of Letters and Science.

Tuition for residents of the State of Wisconsin,	FREE.
Tuition for non-resident students, per semester,	$15.00
General expenses, per semester,	10.00

College of Mechanics and Engineering.

Tuition for non-resident students, per semester,	15.00
General expenses, per semester,	20.00

School of Pharmacy.

Tuition for non-resident students, per semester,	15.00
General expenses, per semester,	20.00

College of Agriculture.

Tuition for non-resident students, per semester,	9.00
General expenses, per semester,	6.00
General expenses, Short Course and Dairy Course,	5.00
Tuition for non-resident students, Short Course or Dairy Course,	6.00
Lecture fee non-resident Dairy Students,	10.00

College of Law.

Matriculation fee, first year,	85.00
Matriculation fee, second year,	60.00
Matriculation fee, third year,	60.00
Matriculation fee for students graduating in one year,	110.00

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.

School of Economics, Political Science, and History.

The fees in this School are the same as in the College of Letters and Science.

Wisconsin Summer School.

General fee for all students,	$15.00

School of Music.

Persons who are members of other colleges or schools of the University may take the courses of music specified on page 109 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, first semester, ...	$30.00
Room rent, heat, and light, second semester, ...	20.00
Board in Ladies' Hall, payable to the Matron, per week,	3.50
Washing, Ladies' Hall, per dozen, ...	.60

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 histology (short course) $2.00; for histology (long course) and embryology, $8.00 per semester; 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, for Pharmacy students, $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.

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.—The following laboratory fees are required:
Junior Year: Chemical Laboratories, $20.00; Botanical Laboratory, $8.00; Practical Pharmacy, $10.00

Senior Year: Chemical Laboratory, $10.00; Botanical Laboratory, $8.00; Pharmaceutical Chemistry and Thesis, $35.00; Practical Pharmacy, $15.00; Pharmacognosy, $10.00.

College of Agriculture.—The following laboratory fees are required:

Dairy School Laboratory, $6.00; Farm Dairy Laboratory, $2.00; Bacteriology: University Students, $8.00; Advanced Dairy Course, $6.00; Pasteurizing Course, $1.00.

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

GYMNASIUM AND MILITARY DRILL.

Male students 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. In the gymnasium a fee of two dollars per year is required, and one dollar additional is required of students who desire the use of a locker. A pair of soft-soled shoes is required for work in the gymnasium. Students required to drill must provide themselves with a uniform. This should be procured at Madison, and costs about fifteen dollars.

Students entering the University should expect to pay the incidental fee, and if not residents of the State, the tuition fee mentioned above; the gymnasium fees, laboratory fees for such courses as begin in Freshman year, and young men must be prepared to defray the cost of a uniform.

GRADUATE DEPARTMENT.

For the full statement of the organization of the Graduate Department reference is made to the heading Department of Graduate Study, pages 34-45 and for the announcement of special courses for graduates see the statements made under the Departments of Study on subsequent pages.

UNDERGRADUATE DEPARTMENT.

There are two general schemes or systems of study by which the bachelor's degree may be reached: the Course System and the Group System (p. 67), the fundamental idea in the one being variety and breadth of culture; in the other, concentration and thoroughness.

The requirements for graduation are the same in quantity under each system. The unit-hour is the standard for computing the amount of work required. This is equal to one hour of recitation or lecture per week for one semester. Two hours of laboratory work or two hours of regularly prescribed physical exercise in the gymnasium are credited as one unit-hour. Students are expected to take 15 hours per week in recitation, 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; and one synoptical lecture per week is required during the last two years, making 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, 132 unit-hours for the men and 128 for the women.

Arrangements have been made by which the work of the Summer School may be credited as part of the work required for graduation. Courses in the Summer School have different values, and by attendance at the School a total amount of credit may be acquired not exceeding five recitations per week for one semester. No student will hereafter be permitted to receive during the college year a credit toward graduation of more than eighteen hours per week in regular studies except by permission of the Faculty obtained in advance. Students desiring to graduate in three years in one of the regular four-year courses may do so by taking eighteen hours of recitations per week, and by attending three sessions of the Summer School. No credit will be given for a repetition in the Summer School of studies taken in the University, or for repeating in the University, work done in the School. Students will therefore need to select carefully the work taken in the Summer School with reference to the required and

elective studies of the course in which they intend to graduate. Students of the classical courses will find it possible to secure their science in the Summer School, and students in the science course may take electives in history, politics, or allied subjects. These are mentioned simply as illustrations, but students must be careful not to select studies in the Summer School which constitute also an integral part of a year's course in the University, which they also propose to take in their course. Thesis work can be done in the Summer School with great advantage to the student if the professor under whom the thesis is taken is a teacher in the School, and is able to devote the time necessary for the supervision of the thesis. In case a student desires to do thesis work arrangement should be made with the professor during the college year; and any student hoping to shorten his course by means of the Summer School should consult his class officer in selecting his studies.

A. THE COURSE SYSTEM.

The University offers, in the College of Letters and Science, six 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. In the Ancient and the Modern Classical courses, languages, ancient and modern, are the central studies. In the General Science and Pre-medical courses, science; 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. The Chicago College of Physicians and Surgeons, Rush Medical College, and the Chicago Medical College have approved the course and will accept it as the equivalent of one year's study, thus enabling those who have taken the four years' course here to complete their medical course in these colleges in three years.

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.

REQUIREMENTS FOR THE DEGREE OF BACHELOR OF ARTS.

Ancient Classical Course.

Freshman Year: Greek 4;* Latin 4; mathematics 4; rhetoric 2; Greek and Roman history 2; military drill 2; gymnastics 2; 36 unit-hours for the year.

Sophomore Year: Greek 4; Latin 2; German or French 4; physics 3; rhetoric 2; military drill 2; gymnastics 2; elective 2; 36 unit-hours for the year.

Junior and Senior Years: Philosophy 5, one year; synoptical lectures 1, two years; thesis 3, one semester; electives, enough to make 132 unit-hours.

Students prepared to enter the Modern Classical Course may enter the Ancient Classical Course and graduate with the degree of Bachelor of Arts by beginning Greek in Freshman year, 5 hours per week, and continuing it 4 times per week through Sophomore and Junior years.

REQUIREMENTS FOR THE DEGREE OF BACHELOR OF LETTERS.

1. Modern Classical Course.

Freshman Year: German 4; Latin 4; mathematics 4; Greek and Roman history 2; rhetoric 2; military drill 2; gymnastics 2; 36 unit-hours for the year.

Sophomore Year: German 2; Latin 2; French 4; physics 3; rhetoric 2; military drill 2; gymnastics 2; elective 2; 36 unit-hours for the year.

Junior and Senior Years: Philosophy 5, one year; synoptical lectures 1, two years; thesis 3, one semester; electives enough to make 132 unit-hours.

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

Freshman Year: Latin or German 4; mathematics 4; Greek and Roman history 5 (first semester); English history 5 (second semester); rhetoric 2; military drill 2; gymnastics 2; 34 unit-hours for the year.

Sophomore Year: German 4; French 4; science (physics, biology or chemistry) 5; rhetoric 2; military drill 2; gymnastics 2; elective 2; 36 unit-hours for the year.

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*The figures refer to the number of hours required weekly throughout the year.

Junior and Senior Years: Philosophy 5, one year; Latin, German, French, or Norse, one year (the German must be taken if begun in Sophomore year); synoptical lectures 1, two years; thesis 3, one semester. The remaining studies, sufficient to make 132 unit-hours, are elective, except that the equivalent of twelve hours per week for one year must be elected in history, economics, and political science.

3. English Course.

Freshman Year: German 4; English history 5 (first semester); Greek and Roman history 5 (second semester); mathematics 4; rhetoric 2; military drill 2; gymnastics 2; 34 unit-hours for the year.

Sophomore Year: German 4; English literature 3; physics 5, or biology 5, or chemistry 5; rhetoric 2; military drill 2; gymnastics 2; elective 2; 36 unit-hours for the year.

Junior and Senior Years: Philosophy 5, one year; English language and literature 5, two years. (This must include the course in Anglo-Saxon and middle English which must be taken in the Junior year.) Study of a language other than English and German 4 or 5, one year; synoptical lectures 1, two years; thesis 3, one semester; electives enough to make 132 unit-hours.

REQUIREMENTS FOR THE DEGREE OF BACHELOR OF SCIENCE.

1. General Science Course.

Freshman Year: Biology 5; German 4; mathematics 4; rhetoric 2; military drill 2; gymnastics 2; 34 unit-hours for the year.

Sophomore Year: French 4; chemistry or mathematics 5 (if mathematics is chosen, chemistry must be taken in Junior year); physics 5; rhetoric 2; military drill 2; gymnastics 2; 36 unit-hours for the year.

Junior and Senior Years: History, philosophy, political science, or economics 5, one year; advanced French or German 4 or 5, one year; advanced science 5, two years; synoptical lectures 1, two years; thesis 3, one semester; elective studies enough to make 132 unit-hours.

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.

SPECIAL COURSES FOR NORMAL GRADUATES.

To these courses the regular graduates from the advanced courses of the State Normal Schools of Wisconsin will be admitted until 1897, with the rank of Juniors. Two years of successful study will enable the graduates to complete one of the courses, and by proper selection of studies, to graduate with the degree of Bachelor of Letters or of Bachelor of Science. Two years of residence at the University are required of candidates for a degree.

Normal graduates who may have a sufficient knowledge of Latin, French, or German, in addition to the full acquirements of normal school graduates, may take such studies as will be the nearest available equivalents of those of the Modern Classical Course.

English Course for Normal Graduates.

JUNIOR YEAR.

I. Language (Latin, French, or German), 4 hours throughout the year.

II. History, 3 hours throughout the year.

III. English Literature, Course 5, 3 hours throughout the year. Students who have had a course in English Literature may substitute the course in Anglo-Saxon and Middle English.

IV. (a) Science (chemistry, physics, mathematics, astronomy, mineralogy, or biology), 5 hours throughout the year, or (b) Philosophy, 5 hours throughout the year.

V. Synoptical lectures, 1 weekly throughout the year.

SENIOR YEAR.

I. Language (Latin, French, or German), 4 hours throughout the year.

II. (a) Economics, Course 1, 3 hours, fall term. (b) Additional work in economics or political science, 3 hours, two terms.

III. (a) English literature, 3 hours throughout the year, or (b) History, 3 hours throughout the year.

IV. Electives, sufficient to make, with required work, at least 15 hours throughout the year.

V. Synoptical lectures, 1 weekly throughout the year.

VI. Thesis, 3 hours one semester.

Science Course for Normal Graduates.

JUNIOR YEAR.

I. Science. (1) A continuous course in chemistry, physics, mathematics, or astronomy throughout the year; and (2) A continuous course in botany, zoology, or mineralogy throughout the year. Mineralogy may be taken, preparatory to geology in the Senior year. One of these courses in science may be taken in the Senior year, but if geology is elected, courses in chemistry, mineralogy or physics, or in zoology or botany, should be taken during the Junior year.

II. Language (Latin, German, or French) pursued throughout the year. Students who chose English literature in the normal course will be required to take two courses in language throughout the year.

III. Electives. If either course in science is deferred until the Senior year, elective studies are to be substituted. Extra electives may also be taken by those prepared for them.

IV. Synoptical lectures, one weekly throughout the year.

SENIOR YEAR.

I. Science, a continuous study running through the year. If geology is chosen as one of the three required courses, it should be taken during this year, and be preceded by the two other courses in science.

II. Language (Latin, German, or French) throughout the year. Students who chose English literature in the normal course will be required to take two courses in language throughout the year.

III. Electives. Sufficient to make at least three full studies.

IV. Synoptical lectures, 1 weekly throughout the year.

V. Thesis, 3 hours weekly one semester.

ELEMENTARY GREEK COURSE.

Greek, Goodwin's Grammar, Composition, and Homer's Iliad.

Greek, Xenophon's Anabasis, Elements of Language.

Latin, Cicero's Select Orations, Latin Composition, Virgil.

This course is preparatory to the Ancient Classical Course. See p. 52.

B. THE GROUP SYSTEM.

The object of the Group System is to give continuity, concentration, and thoroughness to the leading lines of study and at the same time to afford a wide (though of necessity only general) familiarity with the broad field of knowledge. The work of the four years is divided into two parts, the first consisting of a group

of basal studies intended to furnish a solid foundation for the second part, which consists of (1) a leading line of study running through two years, constituting the major study of the student; (2) a series of assigned studies supplementary to it, selected by the professor in charge of the leading line; and (3) a series of elective studies sufficient to make up a full course. The basal group of studies will occupy the Freshman and Sophomore years and may in some instances extend into the Junior year. The work of the second part, the university group, will occupy the Junior and Senior years. These courses will be supplemented by synoptical lectures in the leading lines of study not otherwise taken, so that the student will possess some knowledge of their salient features.

THE BASAL GROUP.

Freshman and Sophomore Years.

This group must embrace at least three full studies during each of the first two years of the course, which must include the following:

1. A year's course (four hours weekly) in mathematics.
2. A year's course in physical or natural science with laboratory work.
3. A course in rhetoric, twice a week for two years.
4. Language study, sufficient, in addition to previous work, to give a reading knowledge of two languages besides English. If this is not accomplished by the close of the Sophomore year, language study must be continued.

Among the basal studies there should be at least one course running through a year especially preparatory to the major study contemplated in the last two years of the course.

UNIVERSITY GROUPS.

Junior and Senior Years.

This groups the work of the last two years of the course, and must include at least the following:

1. *A Major Study* running consecutively through two years, constituting the leading study of the student. Extra work beyond the usual requirements of a full study will be expected, the precise amount and form of which will be determined by the professor in charge.

2. *An Assigned Minor Study*, to be named by the professor in charge of the major study, which it is intended to supplement. This will be equivalent to one full course for two years, and may be a single continuous study or a succession of courses selected from different groups.

3. *An Elective Minor Study*. This may be made up of a series of courses or of a single continuous study, and must be at least equivalent to a full study throughout the last two years of the course.

4. *Synoptical Lectures* will be required as ordered by the Faculty. At present, one per week is required,

The major studies are to be selected from the following groups:

1. Psychology, Ethics, Æsthetics, Logic, Pedagogy (Philosophical group).
2. Economics, Political Science (Civic group).
3. History (Historical group).
4. English Language and Literature, Anglo-Saxon, Rhetoric (English group).
5. French, Italian, Spanish (Romance group).
6. German, Norse, Anglo-Saxon (Germanic group).
7. Greek, Latin, Hebrew, (Classic group).
8. Mathematics, Astronomy, Physics (Mathematical group).
9. Botany, Zoology (Biology group).
10. Chemistry, Physics (Chemico-physical group).
11. Mineralogy Petrography, Geology (Geology group).

SYNOPTICAL LECTURES.

The purpose of the synoptical lectures is to present the outlines of the leading branches taught in the University in such a way as to convey the maximum of important information in the minimum of time, so that the students may become familiar with the salient features of subjects which they are unable to take up as regular studies. The aim is to broaden the student's information and interest and correct the effects of too great specialization.

These courses of lectures will be serviceable to students in selecting their leading lines of studies, by enabling them to become familiar with the chief features of the several subjects they may have under consideration before making their choice.

These lectures will be accompanied by class work, and will be closed by an examination.

The lectures and accompanying class exercises will be given between 4 and 6 P. M., five days in the week.

The following courses are given during 1894–95: In biology, in history; in economics and political science; in the classical languages; in English literature, and the great epic poems.

The subjects for 1895–96 are as follows: In modern languages, on German, French, and Norse; in the mathematical group, lectures on pure and applied mathematics and astronomy; in the chemico-physical group, on chemistry; in the philosophical course, lectures on psychology, philosophy, ethics, and æsthetics; in the geological group, courses on mineralogy, petrography, paleontology, and geology.

GENERAL INFORMATION.

LITERARY AND SCIENTIFIC SOCIETIES.

The literary societies, the Athenæan, Hesperian, Philomathian, and Phœnix, composed of gentlemen, and the Castalian and Laurean, composed of ladies, are sustained with unusual interest and constitute an important means of intellectual training. A German society, the Bildungsverein, and a Scandinavian society, the Nora Samlag, cultivate an interest in the German and Norse languages and literature. There are also journal clubs in the departments of biology, mathematics, physics, and chemistry.

LADIES' HALL.

Lady students are allowed the same choice of boarding accommodations that is accorded to gentlemen, but to provide for those who prefer a home under the immediate auspices of the University, a Ladies' Hall is maintained. It contains suits of rooms for sixty-two students, and ample accommodations for boarding. The apartments are in suits of two and three rooms, each suit accommodating four students. There is a bath room on each floor. The building is heated by steam, lighted by gas, and has three fire-escapes. 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 preceptress, and are required to board in the Hall. They are expected cheerfully to conform with the requirements necessary for a family of students. Students are admitted only on the expectation of remaining throughout the semester. No deduction is made for voluntary absence, and any commutation in cases where students leave before the close of the term, except in cases of necessity, is entirely voluntary with the matron in charge. To secure rooms in advance, payment of room-rent for the ensuing term must be made to the Secretary of the Board. The music department has accommodations in this building, with music rooms for piano practice, and a hall for the use of the general music classes, gymnastics, and the ladies' literary societies.

No responsibility is assumed for lady students rooming in the city beyond that involved in good scholarship and general deportment.

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.

Tuition for residents of the State of Wisconsin, . . .	FREE.
Tuition for non-resident students, per semester, . . .	$15.00
General Expenses, per semester, ...	10.00
Room-rent, Fuel, and Light in Ladies' Hall, first semester,	30.00
Room-rent, Fuel, and Light in Ladies' Hall, second semester,	20.00

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

Students will be charged for not less than one semester, and no deduction will be made for voluntary absence. Payment of all University charges for tuition, general expenses, room-rent, etc., is required strictly in advance, and is to be made to the Secretary of the Board of Regents, whose office is in the Law Building.

Students working in the laboratories are required to pay a fee to cover the cost of the materials and instruments used by them. When this cannot be fixed beforehand, a deposit sufficient to cover the probable cost is required and an account of the same is kept, and the amount of the deposit not used is returned to the student at the close of his term of study in the laboratory.

The items of expense are subject to revision at the commencement of each collegiate year.

A full statement of charges and fees is given on pages 59, 60.

THE COLLEGE YEAR.

Beginning in September, 1895, important changes will be made in the college year. Hereafter the year will be divided into two semesters instead of three terms. The first semester will open 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 coming college year the date of the opening second semester will be February 10, 1896. 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 Monday morning, and all arrangements for rooms, board, books, etc., as well as registration at the University, must be made before that time. Commencement will occur on the Thursday preceding the last Tuesday in June. In 1896 the date will be Thursday, June 19; in 1895 it occurs Thursday, June 20.

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

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

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. A full account of graduate work is given on pages 34-45 of the catalogue.

PHILOSOPHY.

PROFESSOR STEARNS, PROFESSOR JASTROW, AND DR. SHARP.

1. General Psychology. James' Outlines of Psychology, lectures, and readings. *First semester; M., Tu., W., Th., F., in three divisions, at* 9, 2 *and* 3. Professor JASTROW and Dr. SHARP.

2. Experimental Psychology. (a) Lectures and demonstrations covering in a fairly comprehensive and practical manner the field of experimental psychology. *Second semester; Tu., Th., at* 9. (b) Laboratory work in psychology; Sanford's Course in Physiological Psychology. *Second semester; three hours weekly.* Professor JASTROW.

3. Advanced Experimental Psychology. Special themes are experimentally treated and the literature consulted under personal supervision. *Throughout the year; three times weekly.* Professor JASTROW.

4. Comparative Psychology. Lectures covering the more important topics in animal psychology and the development of the child. *First semester; M., W., F., at* 10. Professor JASTROW.

5. 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. *Second semester; Tu., Th., at* 2. Professor JASTROW.

6. Anthropological Psychology. Lectures covering from a psychological point of view the topics treated in Tylor's Anthropology. *Second semester; Tu., Th., at* 10. Professor JASTROW.

7. History of Philosophy. (a) History of Greek Philosophy; Zeller's Outlines of Greek Philosophy, and Windelband's History of Philosophy. *Second semester; M., W., F., at* 10. Professor STEARNS. (b) The Idealistic Philosophy; Falckenberg's History of Modern Philosophy. *Second semester; Tu., Th., at* 10. Dr. SHARP. (c) History of English Philosophy, from Locke to Herbert Spencer. *First semester; Tu., Th., at* 8. Professor STEARNS.

8. The Philosophy of Lotze. Metaphysics and the Philosophy of Religion. *First semester; three times a week, hours and days on consultation.* Professor STEARNS.

9. The Philosophy of Modern Science. Discussion of some of the problems in the philosophy of nature. *Second semester; twice a week, hours and days on consultation.* Professor STEARNS.

10. 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. Special attention will be paid to the bearing upon psychology of the problems considered. *Throughout the year; three times a week.* Dr. SHARP.

11. Readings in German Philosophy. Ihering's Zweck im Recht. *Second semester; twice a week.* DR. SHARP.

12. Philosophical Seminary. *Throughout the year; fortnightly, Tu.,* 4-6. Required of Group students in Philosophy. Professor STEARNS, Professor JASTROW, and Dr. SHARP.

13. Systematic Ethics. The greater part of the time is devoted to a study of Martineau's views as presented in his Types of Ethical Theory. This study of a representative intuitional theory will be supplemented by a course of lectures on utilitarianism. *Second semester; M., W., F., at* 10. Dr. SHARP.

14. Advanced Ethics. (a) Theoretical ethics. Open only to students who have taken course 13. *First semester; M., W., and F., at* 10. (b) Problems in applied ethics. *First semester; Tu., Th., at* 10. Omitted in 1895-1896. Dr. SHARP.

15. Æsthetics. (*a*) Philosophy of Art and Art Criticism. *First semester; M., W., F., at* 8. (b) *History of Art. Second semester; M., W., F., at* 8. Professor STEARNS.

16. Elementary Logic. To a certain extent Fowler's Logic Deductive and Inductive, 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. *Second semester; M., W., F., at* 2. Professor JASTROW.

17. Advanced Logic. Lectures upon the nature of deductive and inductive reasoning; the history of logic; the principles of science, fallacies, etc. *First semester; Tu., Th., at* 10. Professor JASTROW.

18. Synoptical Lectures. *First twelve weeks:* Æsthetics, Professor STEARNS; *second twelve weeks:* Thinking, Professor JASTROW; *third twelve weeks:* Problems in Applied Ethics, Dr. SHARP.

In the first semester are given courses 1, 3, 4, 7 (c), 8, 10, 14 (a) and (b), 15 (a) 17; in the second semester, 2 (a) and (b), 3, 5, 6, 7 (a) and (b), 9, 10, 11, 13, 15 (b), 16.

PEDAGOGY.

PROFESSOR STEARNS.

1. History of Educational Theories and Institutions, Greek, Roman, and Modern; lectures, readings, and essays. *First semester; M., Tu., W., Th., F., at* 9.

2. School Supervision. The making and administration of courses of study, examinations, promotions, inspections, etc. *First semester; Tu., Th., at* 10.

3. The Philosophy of Education. Lectures, readings, and discussions on the nature, forms, and elements of education. *Second semester; M., W., F., at* 9.

4. The Herbartian Pedagogy. Herbart's Science of Education; Rein's Pedagogics; Lange's Apperception. *Second semester; twice a week; hours and days on consultation.*

5. Methods and Management in Grammar and High School Grades. *Second semester; Tu., Th., at* 9.

6. Problems in Applied Psychology. The training of faculty, child study, mental and bodily defects, etc. *Second semester; Tu., Th., at* 10.

ECONOMICS, SOCIOLOGY, MUNICIPAL GOVERNMENT.

PROFESSOR ELY, ASSOCIATE PROFESSOR SCOTT, MR. BULLOCK, DR. SHARP.

A full statement of the twenty-eight courses in these departments is given on pages 112-116 of the catalogue under the heading School of Economics, Political Science, and History. Course 1, The Elements of Economic Science, is repeated each semester, *M., Tu., Wed., at* 8.

POLITICAL SCIENCE.

PROFESSOR PARKINSON.

A full statement of the seven courses offered in political science is given on page 117 of the catalogue.

The introductory course on Elementary Law is given on *Tu. and Th., at* 10; the Elementary course on Constitutional Law on *Tu. and Th., at* 9.

HISTORY.

PROFESSOR TURNER, PROFESSOR HASKINS, ASSISTANT PROFESSOR COFFIN, MR. LIBBY, AND MR. T. C. SMITH.

A full statement of the fifteen courses in history is given on page 118 of the catalogue under the heading of the School of Economics, Political Science, and History.

Course 1, Ancient History, is required of Freshmen in the Ancient and Modern Classical courses. *Throughout the year, Tu., Th., at* 9.

Required of Freshmen in the Civic-Historical Course. *First semester, M., Tu., Wed., Th., F., at* 10.

Required of Freshmen in the English Course. *Second semester, M., Tu., Wed., Th., F., at* 10.

Course 2, English History, is required of Freshmen in the English Course. *First semester, M., Tu., Wed., Th., F., at* 9.

Required of Freshmen in the Civic-Historical Course. *First semester, M., Tu., Wed., Th., F., at* 9.

GREEK.

PROFESSOR SMITH, PROFESSOR KERR, ASSISTANT PROFESSOR LAIRD.

1. *Elementary Greek.* White's Beginner's Greek Book, Xenophon's Anabasis, Homer's Iliad, Collar and Daniell's Greek Composition. *Throughout the year; M., Tu., W., Th., F., at* 12. Assistant Professor LAIRD.

2. *First Semester:* Lysias, Goodwin's Grammar. *M., Th., F., at* 10. Assistant Professor LAIRD.
   Second Semester: Herodotus VI., Homer's Odyssey VI.–VIII. *M., Th., F., at* 10. Professor KERR.
   Greek Composition, *throughout the year; Tu., at* 10. Assistant Professor LAIRD. (Course 2 is required of Ancient Classical Freshmen.)

3. *First Semester:* Plato's Apology and Crito, Euripides' Bacchantes, Goodwin's Moods and Tenses. *M., Th., F., at* 10. Professor KERR.

Second Semester: Thucydides VII., Jebb's Primer of Greek Literature. *M., Th., F., at* 10. Professor SMITH.

Greek Composition, *throughout the year; Tu., at* 10. Professor SMITH. (Course 3 is required of Ancient Classical Sophomores.)

4. Herodotus III., selected dialogues of Lucian. *Throughout the year; M., F., at* 11. Assistant Professor LAIRD. (Course 4 is an elective for Sophomores, but 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* 11. Professor SMITH.

Second Semester: Demosthenes' De Corona, Aristotle's Politeia. *M., W., F., at* 11. Assistant Professor LAIRD. (Course 5 is open to Juniors and Seniors.)

6. Greek Dramatic Poets. *First Semester:* Æschylus' Prometheus, Sophocles' Œdipus Rex, study of meters.

Second Semester: Aristophanes' Clouds, Aristotle's Poetics, Discussion of the Greek Drama. *M., W., F., at* 11. Professor SMITH. (Open to Juniors and Seniors; omitted in 1895–6.)

7. Plato. Selections from the Phaedo, Gorgias, Republic, and Laws, with readings from several of the shorter dialogues. This course is intended as an introduction to the study of Greek Philosophy. *Throughout the year; Tu., Th., at* 11. Professor KERR. (Open to Juniors and Seniors. Not given in 1895–96.)

[8. 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; Tu., Th., at* 11. Professor KERR. (Courses 7 and 8 are given in alternate years. Course 8 in 1895–96.)]

9. Lectures on the life of the ancient Greeks, illustrated by means of lantern slides. Once a week, *throughout the year.* Professor SMITH. (A knowledge of Greek is not required for this course.)

The object of the graduate courses in Greek is to secure, on the part of advanced, especially graduate, students, 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 weekly to hear and to discuss carefully prepared papers. The work of the Seminary will be supplemented by courses of lectures, and regular reports will be made by the members on the contents of classical periodicals.

10. Greek Seminary. The year will be given to the study of Thucydides. The whole of the author will be read privately by the members of the class. In the Seminary meetings each member will lead in turn, presenting a paper embodying a critical discussion of some passage of the text, or of some topic especially assigned. 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 reading and writing Greek. *Throughout the year, Sat.* 9–11 Professor SMITH. (Open to graduates, and, by special permission, to others who have taken the Junior Elective, or its equivalent.)

11. Greek Antiquities, State and Private. Two lectures a week, *throughout the year*. Professors SMITH and KERR. (Open to graduates, and, by permission, to Juniors and Seniors.)

12. Comparative Greek Grammar. (See Comparative Philology 2.)

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.)

[2. Greek Grammar. History of the sounds and forms. *Throughout the year; T., Th.*, 9. Assistant Professor LAIRD.]

3. Latin Grammar. *First Semester:* History of the sounds and forms. *T., Th.*, 8. Assistant Professor LAIRD.
Second Semester: Syntax; *Tu., Th.*, 8. Professor HENDRICKSON.
Courses 2 and 3 will be given in alternate years. (1895–96, Course 2; 1896–97, Course 3.)

4. Elementary Sanskrit. Perry's Sanskrit Primer. Selections from Lanman's Reader. *Throughout the year; M., W.*, 9. Assistant Professor LAIRD.

(Courses 2, 3, 4 are intended primarily for graduates, but are open, by permission, to Juniors and Seniors.)

LATIN.

PROFESSOR HENDRICKSON, ASSISTANT PROFESSOR SOBER, AND MISS ROBINSON.

1. Cicero, Virgil. Cicero's Orations (three), Virgil's Æneid (six books), Latin Grammar and Composition. *Throughout the year; M., Tu., W., Th., F., at* 8. Miss ROBINSON.

2. Cicero, Livy, Horace. Cicero de Senectute, Livy (two books), Selected Odes of Horace, Latin Composition, and Roman Literature, Private readings. 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.* Three divisions: M. Cl. at 10, A. Cl. at 11, Civ.-H. at 8. Assistant Professor SOBER.

3. Cicero, Horace. Selected Letters of Cicero, Selected Satires and Epistles of Horace. Required of Sophomores of Ancient Classical and Modern Classical courses. *Throughout the year; Tu., Th., at* 9. Professor HENDRICKSON.

4. Nepos, Cicero, Terence, Ovid. The aim of this course is to give facility in reading, and large amounts of various authors will be read rapidly. Elective for Sophomores. *Throughout the year; M., W., F., at* 9. Assistant Professor SOBER.

[5. (a) Lucretius, Catullus. Professor HENDRICKSON. (b) Tacitus (Dialogus, Agricola, and selections from the Annals), Juvenal. Assistant Professor SOBER. *Throughout the year, M., W., F., at* 8.]

6. (a) Plautus (Captivi), Terence (Phormio), Selections from the fragments of Ennius and Lucilius, Horace (Epistles II., 1). (b) Cicero de Oratore, Quintilian, Book X. *Throughout the year, M., W., F., at* 8. Professor HENDRICKSON.

Courses 5 and 6 are given in alternate years, course 6, 1894–95; course 5, 1895–96.

[7. History of Roman Literature. Two lectures a week throughout the year, accompanied by readings in Latin and English. For graduate students and others whom the instructor

may admit, a third hour will be given, devoted to an informal discussion of critical questions concerning the authors treated in the lectures, and to the bibliography of the subject. *Tu., Th., at* 8; time of the additional exercise to be arranged. Professor HENDRICKSON.]

8. Latin Grammar. (See Comparative Philology, course 3.) Assistant Professor LAIRD and Professor HENDRICKSON.
Courses 7 and 8 are given in alternate years, course 8, 1894–95; course 7, 1895–96.

9. Seminary. (a) A study of the earliest monuments of literary criticism at Rome. Critical and exegetical study of parts of Suetonius de Grammaticis, of selected chapters of Gellius, of Livy VII., 2, of Horace Epp. II.,1, and of parts of Cicero's Brutus. (b) The Ars Poetica of Horace. The seminary is intended for graduate students, but will be open to others of suitable preparation with the consent of the director. *W., F., at* 9. Professor HENDRICKSON.

10. (a) Roman Private Life. Professor HENDRICKSON. (b) The Topography and Archæology of ancient Rome. Assistant Professor SOBER. Two lectures a week throughout the year, illustrated with lantern slides. *Tu., Th., at* 12.
A knowledge of Latin is not required for this course, which will be given again in 1896–97.

HEBREW AND HELLENISTIC GREEK.

PROFESSOR WILLIAMS.

1. Genesis and the general principles of the Hebrew language. *Throughout the year; three times a week.*

2. Historical Hebrew. Samuel and Kings. Grammatical review and textual criticism. *Throughout the year; three times a week.*

3. Hebrew Seminary. Isaiah will form the center of the work for 1894–5. *Throughout the year; one meeting each week.*
It is hoped that clubs for the study of Isaiah may be formed in the cities and towns of the state, and that this popular work may receive direction and help from the work of the Seminary.

4. Writers of the Assyrian Period. Hebrew syntax. Courses 5 and 6 are intended to give the student a critical view of the literature of this important period of Israelitish history. *Throughout the year; two hours a week.*

5. Hebrew in English. Lectures on the history and literature of Israel. For all students whether they have studied Hebrew or not. *Throughout the year; once a week.*

6. The Fourth Gospel and the general principles of Hellenistic Greek. For students who have not studied classical Greek. *Throughout the year; three times a week.*

7. Matthew-John. Historical study. Textual criticism. Advanced grammar. *Throughout the year; three times a week.*

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*, Grammar and Reader, selections from Norse folk-lore stories, Björnson's En glad Gut, with selections from his shorter stories. *Second semester*, Ibsen's Et Dukkehjem and Brand, and selections from Jonas Lie's stories. *M., T., Th., F., at* 12.

2. Modern Norse. *First semester*, Kielland's Skipper Worse, Lie's Den Fremsynte, and selections from Norwegian and Danish poetry. *Second semester*, Ibsen's Peer Gynt, Tegner's Frithiof's Saga (in Swedish), and selections from Swedish poetry. *M., T., W., Th., F., at* 11.

3. History of Scandinavian Literature. Seip and Broch's Litteraturhistorie, with exercises in composition and the study of Hofgaard's Grammatik and Aars's Retskrivningsregler. *Throughout the year; M., W., F., at* 10.

4. Old Norse or Icelandic. Vigfusson & Powell's Reader, with lectures on early Scandinavian history, literature, and mythology. *Throughout the year; T., Th., at* 10.

[5. Synoptical Lectures. A course of weekly synoptical lectures will be given during part of the year 1895–6.]

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.

The Scandinavian department of the University library affords excellent advantages to students pursuing these studies.

GERMAN.

PROFESSOR ROSENSTENGEL, ASSISTANT PROFESSOR WILKENS, MISS STERLING, MISS REMINGTON, MISS GRIFFITH, AND MR. JONAS.

The aim of the instruction in German in the Modern Classical course is to enable students to understand easily modern German authors, to comprehend German when spoken, and to use with facility oral as well as written German in the simple forms of discourse.

In the General Science and Engineering courses, the aim 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.

In the English and Civic-Historical courses, students are given a reading knowledge of German historical and philosophical literature, thus enabling them to make use of German books on these subjects.

In the Ancient Classical course, the aim is to give in a short time a reading knowledge of classical German.

1. Grammar. Required of Freshmen, English, and Civic-Historical courses, *first semester*. Miss REMINGTON and Miss GRIFFITH, *M., W., Th., S., at* 10, and Miss REMINGTON and Mr. JONAS, *Tu., W., Th., S., at* 11.

2. Reader. Required of English and Civic-Historical Freshmen, *second semester*. Miss REMINGTON, *M., W., F., S., at* 10, and *Tu., W., Th., S., at* 11.

3. Reader of Literature. Required of Modern Classical Freshmen, *first semester*. Wilhelm Tell, *second semester, M., Tu., W., Th., at* 12. Professor ROSENSTENGEL.

4. Hermann and Dorothea, and Maria Stuart. Required of Modern Classical Sophomores, *first and second semester, Tu., Th., at* 10. Professor ROSENSTENGEL.

5. Nathan der Weise, Iphigenie, and Tasso. Elective for Modern Classical Juniors, *first and second semester. M., W., F., at* 9. Professor ROSENSTENGEL.

6. Faust, *first semester*. History of German literature from the beginning of the 16th to the end of the 18th century, *second semester*. Elective for Modern Classical Seniors and for graduates. *M., W., F., at* 11. Professor ROSENSTENGEL.

8. Grammar, Reader and Classical Readings. Required of Ancient Classical Sophomores. *Throughout the year; M., W., F., S., at* 9. Assistant Professor WILKENS.

9. German Science Reader, *first semester*, and Scientific Monographs, *second semester*. Required of General Science and Engineering Freshmen. *M., W., Th , S., at* 10, *and M., Tu, W., Th., F., at* 11. Miss STERLING.

10. German Scientific Monographs. Required of General Science Sophomores who have not, during their Freshmen year, gained a reading knowledge of scientific German satisfactory to the instructor. *Three times a week, throughout the year*. Miss STERLING.

11. German Scientific Monographs. Required of General Science Juniors or Seniors, if French is not elected. *Four times weekly, throughout the year*. Miss STERLING.

12. Selections from German historical and philosophical writers. Required of English and Civic-Historical Sophomores. *Throughout the year; Tu., W., F., S., at* 9, *and Tu., W., Th., F., at* 8. Miss REMINGTON.

14. Middle High German, *first semester, three times a week*. Old High German, *twice a week*, and Gothic, *twice a week during the second semester*. Elective for advanced students, and for graduates. Assistant Professor WILKENS.

15. Seminary (philological). It will be devoted to a close study of special subjects relating to the structure and growth of the Germanic languages, and to problems of Middle High and Old High German literature. Open to graduates and to advanced students. Three times a week throughout the year, at the convenience of the students. Assistant Professor WILKENS.

16. History of German Art Lectures on the history of German art from the oldest period to the time of the Renaissance with special reference to the history of civilization in Germany. *Once a week during the second semester*. Assistant Professor WILKENS.

17. Synoptical Lectures. The purpose of these is to present the most important periods in the progress and development of the German language and literature in the middle ages. *F., at* 4, *during the first semester.* Assistant Professor WILKENS.

18. The study of the history of the German language. *Twice a week during the second semester.* Assistant Professor WILKENS.

20. Conversation and Composition. Readiness in a correct use of the German language, oral and written, is the aim. *Tu., Th., at* 11 *and F., at* 12. Professor ROSENSTENGEL.

21. Seminary (didactic). Elective for advanced students and for graduates who intend to teach German. *Three times a week during the second semester,* at the convenience of those concerned. Professor ROSENSTENGEL.

FRENCH.

PROFESSOR OWEN, MISS GAY, AND MR. GIESE.

1. Elementary Course for Modern Classical Students. Otto's French Conversation Grammar, Roman d'un Jeune Homme Pauvre, La Petite Fadette (the former read mainly and the latter altogether independently of the class-room), Le Cid, Le Misanthrope, Athalie. *Throughout the year; M., W., F., S., at* 9. Miss GAY.

2. Elementary Course for Ancient Classical Students. The same as 1 with the addition of lectures 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 as the progress of the class allows. *Throughout the year; M., W., F., S., at* 9. Miss GAY.

Courses 1 and 2 are at present combined.

3. Elementary Course for Science Students. The same as 1, but with the omission of such portion (usually Athalie and Petite Fadette) as the needs of the class suggest. *Throughout the year; Tu., W., F., S., at* 10; *M., Tu., W., Th., F., at* 11. Miss GAY; *M., Tu., Th., F., at* 10, 11, and 12. Mr. GIESE.

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 any 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.

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, lectures in French on the history of the language, and recitations in French on the same, lectures in French on the early literature of the language, recitations in French from Demogeot's History of French Literature, reading independently for examination an abridgment of Les Trois Mousquetaires of Dumas and other easy French to be assigned. *Throughout the year; M., Tu., W., Th., F., at* 8. Professor OWEN.

5. Advanced Reading and Syntax. Reading in class parts of Cinq-Mars, Ursule Mirouet, Travailleurs de la Mer, etc., reading independently for examination the Histoire de Charles XII. and other easy French to be assigned. *Throughout the year; M., Tu., W., Th., F., at* 8. Professor OWEN.

Courses 4 and 5 are for the present combined, each being treated as an average two and a half hour course for two years.

6. 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.* MR. GIESE.

[7. Synoptical Lectures. A course of synoptical lectures will be given weekly during part of the year 1895–96 on Correspondence, Thought and Sentence, with special reference to the French and English languages. Professor OWEN.]

The following courses are offered with especial reference to graduate students, courses to be determined more exactly as graduate needs appear, as follows:

8. A course in the Principles of Language, confined to correspondence of thought and sentence, especially as illustrated in the English and Romance languages. Professor OWEN.

9. A general course in French Literature, XVI.—XIX. centuries, with collateral reading. Mr. GIESE.

10. A philological course in the oldest French literature. Miss GAY.

The method pursued in the above will approximate that of the Seminary. Special Seminary courses will be furnished if this seems desirable.

SPANISH.

PROFESSOR OWEN AND MR. GIESE.

[1. Elementary. Translations into English of the Spanish exercises in Saur's Conversation Grammar and of Castelar's Historia del año 1883. *Throughout the year; three times a week*; hours subject to change at the opening of each semester. This course is given during the year 1895–96. 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 1894–95. Mr. GIESE.

ITALIAN.

PROFESSOR OWEN AND MR. GIESE.

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. It is given in 1894-95. Professor OWEN.

[2. Advanced. Dante and other classics. *Throughout the year; two hours a week.* To be given in 1895–96. Mr. GIESE.]

ENGLISH LANGUAGE AND LITERATURE.

PROFESSOR FREEMAN, ASSISTANT PROFESSOR HUBBARD, AND MR. PYRE.

I. Language.

1. Anglo-Saxon and Middle English. An introduction to the historical study of 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. Assistant Professor HUBBARD.

2. 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. Assistant Professor HUBBARD.

3. Beowulf. Introduction to the study of Old Germanic Life. *First semester; M., W., F., at* 8. Open to Seniors. Assistant Professor HUBBARD.

4. History of the English Language. A general course. *Second semester; M., W., F., at* 10. Open to all students. Assistant Professor HUBBARD.

5. English Philology Seminary. Critical study of texts; Historical Grammar; Dialects. *Two hours a week throughout the year.* Open to graduates. Assistant Professor HUBBARD.

II. Literature.

6. General Survey of English Literature. Recitations and study of representative masterpieces. 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. Students entering the University at the beginning of the second semester may elect the work of the second semester, if properly qualified. Mr. PYRE.

7. Chaucer. History of the literature of the XIV. and XV. centuries. *First semester; M., W., F., at* 10. Assistant Professor HUBBARD.

[8. The Literature of the Elizabethan Period. *First semester; M., Tu., W., Th., at* 10. Professor FREEMAN. Given in alternate years; 1893–94, 1895–96.]

[9. The Eighteenth Century. *Second semester; M., W., F., at* 10. Mr. PYRE. Given in alternate years; 1893–94, 1895–96.]

10. The English Romantic Movement. *First semester; M., W., F., at* 10. Professor FREEMAN. Given in alternate years; 1894–95, 1896–97.

11. The Victorian Era. *Second semester; M., W., F., at* 10. Mr. PYRE. Given in alternate years; 1894–95, 1896–97.

12. The Drama. Shakespeare. *Throughout the year; M., W., F., at* 9. A part of the *first semester* will be devoted to the History of the English Drama, the remainder of the year to Shakespeare. Open to Seniors. Professor FREEMAN. Given in 1896–97 and each year thereafter.

13. The Epic. Milton, Spenser. *First semester; M., Tu., W., Th., at* 11. Professor FREEMAN.

[14. English Lyric Poetry. *Second semester; M., Tu., W., Th., at* 11. Professor FREEMAN. Given in alternate years 1893–94, 1895–96.]

15. The Novel. *Second semester; M., W., F., at* 11. Professor FREEMAN. Given in alternate years, 1896–97, 1898–99.

16. The English Essayists. *Throughout the year; Tu., Th., at* 12. Mr. PYRE.

17. Literary Criticism. *Second semester; M., W., F., at* 10. Professor FREEMAN.

18. Poetics. *First semester; M., W., F., at* 10. Mr. PYRE.

19. English Literature Seminary. Subject for 1894–95, Robert Browning; subject for 1865–96, Carlyle, Ruskin, Arnold, Newman. Two hours a week in one session, *throughout the year; Tu.*, 4–6. Open to graduates and properly qualified Seniors. Professor FREEMAN and Assistant Professor HUBBARD.

20. Synoptical Lectures. Two courses on the history and development of English Literature in its several periods. Given in 1892–93, 1894–95. Professor FREEMAN and Assistant Professor HUBBARD.

Courses primarily for Graduates: 5. English Philology Seminary. 19. English Literature Seminary.

Courses for Graduates and Undergraduates: 8. Beowulf. 12. The Drama, Shakespeare.

RHETORIC AND ORATORY.

PROFESSOR FRANKENBURGER, PROFESSOR KNOWLTON, MR. CAIRNS, AND MR. SAUNDERSON.

1. Rhetoric. Study of fundamental principles, analysis of themes, paragraph formation; with frequent exercises in the various kinds of discourse, description of engineering structures and machines. Text-books: Genung's Outlines of Rhetoric and Spencer's Philosophy of Style. *Three times a week during the year.* Assistant Professor KNOWLTON.

2. Rhetoric. Analysis of themes, fundamental qualities of style, paragraph formation and study of literary types, with daily exercises in composition. Text-books: Hill's Principles of Rhetoric or Genung's Outlines of Rhetoric, and Hill's Foundations of English or Abbott's How to Write Clearly. *Throughout the year.* The class meets in divisions: C.-H., *Tu., Th., at* 9; Eng., *Tu., Fr., at* 10; M. C., *W., S., at* 11; G. S., *Tu., F., at* 10; A. C., *W., S., at* 10; Engineers, *M., W., F., at* 12. Asssisant Professor KNOWLTON and Mr. CAIRNS.

3. Rhetoric. To follow Course 2. Exercises in debates, essays, orations, with personal criticism. Text-book: Genung's Practical Rhetoric, with supplementary readings from English masterpieces, and lectures on rhetorical criticism. *Twice a week during the year.* Professor FRANKENBURGER, Assistant Professor KNOWLTON, and Mr. CAIRNS.

4. Philosophy of Rhetoric. Open to those who have completed Courses 2 and 3 above. Analysis of great orations, essays, and debates, with higher rhetorical and literary criticism. Orations, discussions, and lectures by members of the class. Text-book: D. J. Hill's Science of Rhetoric, and lectures with supplementary readings. *Throughout the year; M., W., F., at* 12. Professor FRANKENBURGER.

5. Analytical study of masterpieces, ancient and modern. *Twice a week throughout the year; Tu., Th., at* 11. *Elective.* Assistant Professor KNOWLTON.

6. Journalistic and rapid writing. A study of the forms of composition most used in newspaper work and practical life. Choice and treatment of subjects with reference to the needs of the reader. Practice for ease and rapidity in writing news and editorial articles, reviews, etc. Preparation of copy for the printer and proof-reading. Elective for students who have had Courses 2 and 3. *Twice a week for first semester.* Mr. CAIRNS.

7. 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 all Seniors and Juniors who have taken courses 2 and 3. Professor FRANKENBURGER, Assistant Professor KNOWLTON, Mr. CAIRNS, Mr. SAUNDERSON.

8. Elocution and Dramatic Reading. Bell's Principles of Elocution, with lectures and gesture; declamation, with personal criticism; dramatic reading, Macbeth and Othello, or Julius Cæsar and Hamlet. Open to those who have taken Course 9 or its equivalent. *Twice a week throughout the year.* Professor FRANKENBURGER.

9. Elocution. Voice culture, reading, declamations, orations, and gesture exercises. 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. SAUNDERSON.

10. Oratorical Delivery. Open to those who have had sufficient previous preparation to be able to do the work. Declamations and reading from the works of the great orators. Lectures upon the principle of gesture and of oratorical delivery. *First semester; M., W., F.* Mr. SAUNDERSON.

11. Phonetics. A study of speech sounds, and of the laws of voice production, articulation, and pronunciation, based chiefly upon Bell's System of Visible Speech. *Second semester; Tu. and Th. at* 11. Mr. SAUNDERSON.

12 Elocution. Reading and declamations with special reference to analysis of emphasis, and to the interpretation of thought the and feeling by voice and gesture. Lectures upon emphasis and gesture, and upon the interpretation of poetry. *Second semester; M., W., F., at* 9. Mr. SAUNDERSON.

13. 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, on the use and care of the voice, and on principles of gesture. *Twice a week during the year.* Mr. SAUNDERSON.

14. Elocution. (Elective in College of Engineering.) Voice training, and plain reading and speaking of the kind most needed by business and professional men. Lectures upon the use and care of the voice, and upon the principles of effective reading and speaking. *Second semester; twice a week.* Mr. SAUNDERSON.

MATHEMATICS.

PROFESSOR VAN VELZER, PROFESSOR SLICHTER, MR. SKINNER, DR. VAN VLECK, MR. STECKER, AND MR. DOUDNA.

1. Algebra. Progressions, arrangements and groups, binomial theorem, theory of limits, undetermined co-efficients, derivatives and series. Text-book: Van Velzer and Slichter's University Algebra. *First semester; four times a week.* Professor VAN VELZER, Dr. VAN VLECK, Mr. SKINNER, and Mr. STECKER.

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; four times a week;* same divisions as Course 1.

3. Theory of Equations and Determinants. This course is a continuation of Course 1, but must be preceded by Course 2. *Twice a week for one year.* Mr. SKINNER.

4. Analytic Geometry (elementary course). Straight line, conic sections, general equation of the second degree, transcendental curves and an introduction to geometry of three dimensions. *Twice a week for one year.* Dr. VAN VLECK.

5. Calculus (elementary course). Differentiation and integration of functions of one variable with the usual geometric applications: *Three times a week for one year.* Dr. VAN VLECK.

6. Synoptical Lectures on the History of Mathematics. *One lecture a week during one semester.* Professor VAN VELZER.

7. Synoptical Lectures on the Laws of Chance. *One lecture a week during one semester.* Professor SLICHTER.

8. Calculus (advanced course). Partial derivatives and multiple integrals with the usual geometric applications. *First semester; twice a week.* Professor VAN VELZER.

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.* Mr. 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 must be preceded by Course 5. *Three times a week for one year.* Professor SLICHTER.

13. Newtonian Potential Functions. Lectures and required readings on the theory of potentials, with an introduction to spherical harmonics. *Twice a week for one year.* Professor SLICHTER.

14. Projective Geometry. *Twice a week for one year.* Dr. VAN VLECK.

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 1895-96. Mr. SKINNER.

[17. Theory of Functions. *Three times a week for one year* in alternate years. This course will be given in 1895-96. Dr. VAN VLECK.]

[18. Partial Differential Equations of Mathematical Physics. Based on Riemann's Lectures: *Twice a week for one year* in alternate years. This course will be given in 1895-96. Professor SLICHTER.]

19. Theoretical Hydrodynamics. Lectures on fluid motion. *Twice a week for one year,* in alternate years. 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. This course will be given in 1895-'96. Professor VAN VELZER.]

21. Theory of Substitutions. *Three times a week for one year,* in alternate years. This course will not be given in 1895-96. Professor VAN VELZER.

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

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. Text-book: Young's General Astronomy, with collateral reading. *Second semester; three times a week.*

2 (a). General Astronomy. A continuation of the work of 1, with special reference to modern developments in astronomical physics.

(b). Observatory Work and Methods. This course is designed to give to the student some familiarity with the principal astronomical instruments and the methods of employing them in research. It will require attendance at the observatory for two consecutive hours five times a week during the spring, and the nature of the work requires that a part of the exercises shall fall in the evening hours. *Full study throughout the year.*

The above work can be undertaken only by students who have completed a course in general physics; the mathematics of the Freshman year and course 1 in Astronomy. The mathematics of the Sophomore year must either precede or be taken concurrently with the above course.

3. Theoretical Astronomy. This course presupposes in the student a working knowledge of the infinitesimal calculus and the elements of dynamics. Integration of the equations of motion and the application of the resulting elements to the computation of ephemerides. Determination of the elements of an orbit from observation. Theory of special perturbations. *Full study throughout the year.*

4. 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 circle, at the same time continuing their theoretical studies. Facilities for independent original work will be afforded to such students, and their work, if of sufficient value, will be printed in the publications of the Washburn Observatory. Eight volumes of these publications, representing the work of the observatory prior to 1894, have already been issued.

[5. Synoptical Lectures. A course of weekly lectures on the growth and present state of astronomy will be given during the fall of the year 1895–96.]

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, DR AUSTIN AND DR. THWING.
MATHEMATICAL PHYSICS: PROFESSOR DAVIES.

1. General Lectures. Mechanics and Heat, Electricity and Magnetism, Acoustics and Optics. Required of students in the Ancient and Modern Classical, General Science and Engineering Courses. Also elective for students in the Civic Historic and English Courses. Two lectures a week. *Throughout the year.* Two sections; *M., W., at* 12; *Tu., Th., at* 12. Professor SNOW. One recitation on Friday or Saturday by the class in smaller sections, at hours to be assigned. Professor SNOW and Dr. THWING.

   This course is intended for those taking up the study for the first time, or for those who have studied it only in an elementary manner.

2. Introductory Laboratory Practice. An introduction to the theory and methods of physical measurements.

   This course is intended to accompany Course 1, and is required of all students who take Course 1, with the exception of those in the Ancient and Modern Classical courses. A knowledge of plane trigonometry, including the use of logarithms, is required for registration in this course. *Throughout the year; twice a week; hours to be assigned.* Dr. AUSTIN and Dr. THWING.

3. Advance Laboratory Practice. Presupposes the completion of Courses 1 and 2, or their equivalents. Required of students in the Physics Group. *Throughout the year; three times a week.* This course may also be elected as a full study throughout the year. *Hours to be assigned.* Professor SNOW, Dr. AUSTIN and Dr. THWING.

   It is desired in this course to give the student further practice in careful physical manipulation, and to acquaint him with the most accurate methods employed in the determination of physical constants.

4. Thesis Work. Required of Seniors in the Physics Group. *Full study throughout the year.* Professor SNOW, Dr. AUSTIN and Dr. THWING.

   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. Not only are the facilities of the laboratory

placed at the command of these students, but as occasion may require, any piece of special apparatus necessary to the carrying out of their investigations will be secured.

5. Precision of Electrical Measurements. A laboratory course in the exact determination of electrical quantities. This course involves the highest accuracy attainable in making determinations of electrical constants and magnetic elements in absolute measure. *First semester; three times a week; hours to be assigned.* Required of Juniors in Electrical Engineering. Professor SNOW and Dr. AUSTIN.

6. Chemical Physics. This course embraces the theory of the constitution of matter, the theory of gases and solution, and electrolysis. *First semester; twice a week, M., W., at* 9. Required of students in the Physics Group. Dr. THWING.

7. Introduction to the Study of Mathematical Physics. This course of lectures will treat of the fundamental equations of theoretical physics, and will be preparatory to the more advanced courses offered by Professor Davies in Mathematical Physics, and Professor Slichter in Applied Mathematics. A knowledge of Analytical Geometry and Calculus will be required for registration. *Throughout the year; Tu., Th., at* 9. Required of Juniors in the Physics Group. Dr. AUSTIN.

8. Mathematical Theory of Sound. An exhaustive mathematical treatment of the subject of acoustics. 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.

9. Mathematical Theory of Electricity and Magnetism. (a) Elementary Theory. This course is offered to students who have completed Courses 1, 2, and 5 in Physics, and 2a in Electrical Engineering. It follows the treatment of the subject as given in Gray's Theory of Absolute Measurements in Electricity and Magnetism, or Mascart and Joubert's Electricity and Magnetism. *Four times a week throughout the first semester.* Professor DAVIES.

(b) Advanced Theory. This is an amplification and continuation of the preceding course. General electro-magnetic theory will be entered into from the standpoint of the best recent experimental and mathematical work. The student is expected to do much collateral reading and to prepare a dissertation embodying the results of his work

upon some special topic chosen or assigned in the early part of the semester. *Four exercises a week throughout the second semester.* Professor DAVIES.

10. Mathematical Physics. This course will supplement Course 7, and is required of students in the Physics Group. It will be mainly concerned with waves in elastic media, including electro-magnetic waves and light. It is intended to make the study of normal functions as applied to such subjects especially thorough and fundamental. The subject will be taught by lectures, reference being made to the most recent standard works on theoretical physics *Full study 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.

11. Graduate Study. This course is designed for those who have completed the equivalent of the work represented by the preceding 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, Dr. AUSTIN, Dr. THWING.

12. Colloquium. A class, meeting one evening each week, for the critical reading and discussion of the current periodical literature. Professor SNOW, Dr. AUSTIN, Dr. THWING.

CHEMISTRY.

PROFESSOR DANIELLS, ASSISTANT PROFESSOR HILLYER, DR. SAUNDERS, AND MR. SCHLUNDT.

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 and Mr. SCHLUNDT. *Second semester.* Qualitative Analysis until the Easter recess; then Descriptive Organic Chemistry, lectures and laboratory work. Assistant Professor HILLYER and Mr. SCHLUNDT.

2. Advanced Inorganic Chemistry, second year. Preparation of chemically pure salts; determination of the equivalence of elements and the density of gases; the principles of gravimetric and volumetric analysis and their applications in the analysis of ores, crude metals, slags, technical products, and gases, together with one exercise each week in theoretical chemistry, the solving of chemical problems and the history of chemistry. *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 Dr. SAUNDERS.

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 Dr. SAUNDERS. For graduates and undergraduates.

4. 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.

Organic analysis, determination of physical constants, special and research work with preparation of thesis. *Full study; second semester.* Assistant Professor HILLYER. For graduates and undergraduates.

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

Students wishing to become practical chemists, physicians, teachers, etc., will so far as is possible be given work that will be of greatest service in accomplishing the end they have in view.

5. Synoptical Lectures. A course of synoptical lectures will be given weekly during part of the year 1895-96.

Twelve hours' laboratory work a week is regarded as the equivalent of a full study.

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.

Instructors and advanced students will 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.

MINERALOGY, PETROLOGY, AND GEOLOGY.

PROFESSOR VAN HISE, ASSISTANT PROFESSORS HOBBS AND CLEMENTS.

Preparatory to a two years' course in the above subjects a reading knowledge of both German and French is desirable, German being especially important. Biology and chemistry should be taken in the Freshman and Sophomore years. It is also advised that physics be taken in the Sophomore year if practicable. All students intending to take work in geology should, if possible, the previous year, take mineralogy 2 during the first semester, and a full year's work in this subject is a very advantageous preparatory study to a long course in geology. When possible it is advised that 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, or mineralogy or petrology, under Assistant Professor Hobbs.

MINERALOGY.

ASSISTANT PROFESSOR HOBBS.

1. General Course. Given as a full study throughout the year. Crystallography and physical and descriptive mineralogy are covered during the first semester. Williams's Elements of Crystallography is used as a text in the course in crystallography. Physical and descriptive mineralogy are treated in lectures, quizzes, and practicums. Blowpipe analysis and determinative mineralogy by blowpipe methods, are taken up in the first part of the second semester and are followed by optical mineralogy, each student being supplied with a microscope for his own special use. Additional work with the goniometer in measuring and projecting crystals is undertaken by all special students, in connection with the work in crystallography. *M., T., W., Th., F., at* 11 *during the first semester* and from 8-10 *during the second semester.*

2. Engineer's Course. A short course adapted to the needs of engineering students is given twice a week during the first semester. The morphological and physical properties which are of most value for purposes of identification of minerals are first studied, but the greater part of the time is devoted to the examination and identification of species. The commoner minerals and those of economic importance are given special attention. Required of civil engineers in the Sophomore year. *First semester, Tu., F., at* 12.

3. Blowpipe Analysis. A short course in blowpipe analysis especially adapted to the needs of pharmacy students. *Twice a week during the second semester*; 8-10.

GEOLOGY.

PROFESSOR VAN HISE AND ASSISTANT PROFESSORS HOBBS AND CLEMENTS.

1. Part I. General Geology. The geological forces and the work they accomplish; the geography of the continents; rocks and their original and secondary structures. Numerous short excursions. Text-book, Geikie's Class Book of Geology. First semester to holiday vacation. *M., Tu., W., Th., 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 vacation. *M., Tu., W., Th., F., at* 12 *and* 4. Assistant Professor CLEMENTS.

   Required of Group students in geology and seniors in civil engineering.

2. Part I. Applied Geology. Treats of potable waters, structural materials, soils, mineral fertilizers, mineral fuels and iron ores. Must be preceded by Course 1. Required of Group students in geology and Seniors in civil engineering. First six weeks of second semester. *M., Tu., W., Th., F., at* 12. Assistant Professor CLEMENTS.

   Part II. Field Geology. Systematic mapping of selected areas. The study includes a consideration of the physical and paleontological data for correlating the outcrops of different formations, and for placing them at definite positions in the geological time scale. Required of Group students in geology. Last 12 weeks of second semester. *F.*, 2-6, *Sat.*, 9-1 *and* 2-6. Professor VAN HISE.

3. Petrology. The work in petrology is given as a full study throughout a year and naturally follows the general course in mineralogy, in which are included lectures on the optical properties of minerals and microscopic study of the common rock-making minerals. In the course in petrology is included a course of lectures on the structures and classification of the crystalline rocks, but most of the time is devoted to the practical study of rocks by means of the microscope and its accessories. The study of some problem of crystalline geology is undertaken as thesis work.
Required of Group students in geology. *M., Tu., W., Th., F.*, 8-10, or at other hours arranged with the instructor. Assistant Professor HOBBS.

4. Systematic Paleontology. Special stress is placed upon invertebrate paleontology. Students will become familiar with the most characteristic fossils, by examination in the lecture room, and more detailed study in the laboratory. *First semester; M., Tu., W., Th., F.* Assistant Professor CLEMENTS.

5. Advanced and graduate courses in geology are offered. The character of the work is adapted to the individual students. Special facilities are offered in physical geology and Pre-Cambrian geology by Professor VAN HISE, in petrology by Assistant Professor HOBBS, and in paleontology by Assistant Professor CLEMENTS. Required of Group students in geology as a minimum, one term's work and a thesis. Time to be arranged with instructor.

[6. Synoptical Lectures. The courses running through the year include mineralogy and petrology by Assistant Professor HOBBS, systematic paleontology by Assistant Professor CLEMENTS, and physical geology by Professor VAN HISE. *M. at* 4.]

BIOLOGY.

PROFESSOR BIRGE, PROFESSOR BARNES, ASSISTANT PROFESSOR RUSSELL, DR. MILLER, DR. MARSHALL, MR. CHENEY, AND MR. HEALD.

1. General Biology. Introductory to both botany and zoology, and required as preliminary to all advanced work in either department. Two recitations or lectures a week, and ten hours' weekly of laboratory work, using as a hand-book Dodge's Biology.

The recitations are given in the afternoon, at 3 in the *first semester*, 2 in the *second semester*. The class meets in two divisions, *M., W.; Tu., Th.* Professor BARNES 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. HEALD. Required of Freshmen in General Science Course.

In the first semester the general principles of biology are studied for the first month, the remainder of the semester is devoted to botany. The second semester is given to zoology. Students can enter the course in either semester.

2. Vertebrate Anatomy. This course consists of lectures and dissections of typical vertebrates in the laboratory. In the first semester the work will be on the skeleton, muscles, and viscera; in the second semester on the nervous and vascular systems. In the latter part of the second semester Amphioxus, and its relations to the Vertebrata will be studied. *Throughout the year;* 11-1. Dr. MILLER.

3. Invertebrate Zoology. A. General course in the morphology and classification of Invertebrates. *First semester; full study.*

   B. Anatomy of Arthropoda and Echinoderma. *Second semester; 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. Animal Histology. Short course. Open only to students taking Course 4. *First semester; Tu., Th , at* 8. Dr. MILLER.

6. Vertebrate Histology. Instruction in this course is given both by laboratory work and lectures. This course should be preceded by Course 2. *Full study; first semester*, 9-11. Dr. MILLER.

7. Vertebrate Embryology. This course follows Course 2 and is a full study for the second semester. The development of the chick during the first four days is studied. Laboratory work and lectures. *Full study; second semester*, 9-11. Dr. MILLER.

8. 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 must have been taken in order to enter this course. Modern methods of research and reconstruction methods will be given special attention.

Thesis work. 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 their thesis should be selected during the Junior year, and the preliminary work begun. Dr. MILLER.

9. Invertebrate Embryology. Special attention will be given to the segmentation of the egg, and the formation of gastrula in various groups of invertebrates, and to the leading types of metamorphosis of invertebrates. *Second semester; full study.* Dr. MARSHALL.

10. Thesis Work in Invertebrate Zoology. Group students in zoology may take their major subject in invertebrate zoology, following Courses 1 and 2 by 3 and 9. Work for a thesis and for graduates is offered in the study of lake life, for which the situation of the University affords unusual advantages. During the past year work has been done on the variations of Daphnia and on the vertical distribution of the pelagic crustacea. This work will be continued during the year 1895-6. Professor BIRGE and Dr. 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 the first half of Course 3 in addition to Course 1.

11. Summer Courses in Zoology. See announcement of Wisconsin Summer School on later pages.

15. General Morphology of Plants. The course is recommended only as a sequel to 1. Its aim is, by a study of the structure of various types of plants, to fill out and complete the student's idea of the forms of vegetable life. To this end such plants will be used as supplement those in Course 1. First semester, Thallophyta and Bryophyta; second semester, Pteridophyta and Spermaphyta. In the second semester attention will also be given to collecting and naming such groups of plants as each student may select for his special study. Ten hours a week throughout the year. *Daily; hours on consultation.* Professor BARNES.

16. Vegetable Histology. Systematic study of the tissues of phanerogams and ferns. Use of reagents and stains, modes of imbedding, section cutting, and mounting. Ten hours a week, first semester. Laboratory guide: Strasburger's Practical Botany. *Daily; hours on consultation.* Professor BARNES and Mr. CHENEY.

17. Organogeny and Embryology. A study of the development of organs and the embryo. Ten hours a week, second semester. Suitable for graduates and undergraduates who have pursued Courses 1 and 15 or 16. *Daily; hours on consultation.* Professor BARNES.

18. Vegetable Physiology. A course in experimental physiology, supplemented by reference readings. Biology 15 or 16, Chemistry 1, and Physics 1 and 2 must precede this, and it is very desirable that those taking it should be able to read German readily. The necessary observations sometimes require extra time and work at unusual hours, which those taking the course should be willing to give. For graduates and undergraduates. Ten hours a week throughout the year. First semester, Physical Physiology; second semester, Chemical Physiology. Laboratory guide: Darwin and Acton's Physiology of Plants. *Daily; hours on consultation.* Professor BARNES.

19. Bryology. The large collections of mosses and of the literature relating to their classification offer unusual facilities for special and original work in the study of the moss flora. The course is offered only to graduates or advanced students who can devote considerable time to its prosecution, and no credit will be given for less than a year's work. First semester, determination of general collections. Second semester, critical study of assigned group. Ten or fifteen hours a week throughout the year. Manuals: Lesquereux and James, Mosses of North America; Barnes's Keys to the Genera and Species of Mosses. *Daily; hours on consultation.*

20. 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, algæ, lichens, mosses, and ferns, illustrated by selected types. Second semester, the form and structure of the organs of seed plants. The course will be supplemented by botanical excursions, six in the autumn and ten in the spring. *Daily*, 9-11. Excursions on Saturdays. Mr. CHENEY.

21. Herbarium Work. Pharmacy students are required to prepare during the summer, and to present at the opening of their Senior year, a collection of 50 species of seed-plants from the vicinity of their homes, named and mounted; 25 of these are also to be fully described.

A duplicate of this collection, in which the plants are named, but not mounted nor described, must also be presented; this will be retained by the University. Students will also be required to arrange a collection of drugs, authentic specimens being furnished by the University. Mr. CHENEY.

22. Anatomy of Drugs. Vegetable histology applied to the examination of commercial drugs. Course 11 must precede this. The drugs from collection required in Course 21 will be used. *Second semester; Daily*, 11-1. Mr. CHENEY.

23. Bacteriology. General course, including the study of typical forms with the microscope and in cultures. The course will cover the general field, although special attention will be given to disease-producing germs, in the latter part of the course. Applicants must be thoroughly familiar with the compound microscope. Text-book, Abbott's Principles of Bacteriology. Lectures and laboratory work. *January to April; full study.* Assistant Professor RUSSELL.

Arrangements may be made by which this course may come in the first semester.

24. Advanced Work in Bacteriology. A limited number of students prepared to do advanced work can be accommodated in the laboratory. Arrangements for work of this sort may be made upon consultation with instructor. No credit will be given on work less than full study for full semester. Assistant Professor RUSSELL.

25. Synoptical Lectures. A course of synoptical lectures is given in 1894–95 and will be repeated during the year 1896-97.

26. Summer Courses in Botany. See announcement of the Wisconsin Summer School on later pages.

A Journal Club meets on alternate Thursdays for reviews of current biological literature.

Those who wish to pursue continuous work in botany for four years can do so by taking the courses in the following order: 1; 15; 16 and 17; 18: 1; 15, or 16 and 17; 18; 19: or, 1; 16 and 17; 15; 18.

For those who expect to teach botany in high schools 1 and 15 are the *minimum* preparation desirable; they are recommended to take in addition Course 20 in part as a review.

The course in general biology, 1, is to be taken by students in the course system and as one of the basal studies by those making biology a major under the Group system. A major in biology can be made by adding to Course 1 two years' work in either botany or zoology.

In all full year courses work may be begun in the second semester and completed the following year.

PHYSICAL EDUCATION.

DR. ELSOM, MR. EVERETT, AND MISS BAUER.

Through the liberal appropriation made by the Legislature in 1891, means were provided for the construction of a new Armory and Gymnasium. The building 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 twenty feet wide. Lecture-rooms, 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, beautifully 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 165 x 95 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, foot-ball, 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 grand stands, a 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 the Freshman class, illustrated by various physical charts and other apparatus. Attendance at these lectures is required of all Freshmen. Examinations on the subjects covered by these lectures is given at the end of the course.

Physical Training for Women.

MISS BAUER.

An opportunity for systematic physical training is offered to the young women of the University in the gymnasium connected with Ladies' Hall. The object of the work is to secure a good physique, strength, better health, self-control, and grace. The work is under the personal direction of the instructor, and includes free gymnastics, marching, pulley-weight work, dumb-bell drill, wand drill, club swinging, etc.

Gymnasium work is required of the young women of the Freshmen and Sophomore classes, and of special students ranking with those classes, on two days of the week, one hour each day.

The students will be examined as to their physical condition at the beginning and close of each year.

MILITARY SCIENCE AND TACTICS.

LIEUTENANT CHYNOWETH.

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 the special courses, except adult special students over twenty-two years of age, for the first two years of such courses, are required to take military drill.

The work of the department embraces a course in tactics, a course of lectures on military subjects and practical instruction in the school of the soldier, company, and battalion, and target practice. The class in tactics is organized November 1st of each year, and may be elected by both classes. All non-commissioned officers are required to take the course, which continues through the winter. The course of lectures may be elected during Sophomore year Commissioned officers are expected to take this course. The study value of tactics 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, will be required to drill during their Freshman year only; *provided*, that they furnish certificates from superintendents of military schools or commanding officers of military companies, setting forth in detail the military duty performed; that they take the full course in drill regulations, maintaining a good class standing.

Drill for Freshmen begins at the opening of the fall term and is held twice a week throughout the year. Well-instructed Freshmen may be assigned to duty as drill masters. A thorough knowledge of the school of the soldier is a prerequisite for such assignment. The Sophomore privates commence drill November 1st.

The uniform of the battalion is prescribed by regulation, and can be obtained in Madison.

ROSTER

of officers of the battallion for the year 1894-95.

First Lieut. Edward Chynoweth, 17th Infantry, U. S. Army, Commandant; Major, R. C. Cornish; Adjutant, First Lieut., L. Torbe.

Company A.—Captain, B. Tilton; first lieutenant, W. F. McGregor; second lieutenant, A. W. Fairchild.

Company B.—Captain, W. H. Mann; first lieutenant, J. S. Coe; second lieutenant, H. W. Reilly.

Company C.—Captain, P. H. Sawyer; first lieutenant, P. F. Brown; second lieutenant, J. M. Cantwell.

Company D.—Captain, W. F. Hase; first lieutenant, W. Ruger, Jr.; second lieutenant, E. H. Kronshage.

Band Leader—Second Lieut. E. C. May.

MUSIC.

PROFESSOR PARKER AND MR. SIRED.

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.

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. The University no longer assumes responsibility for private lessons of any kind. (See statement of the School of Music.)

Classes meet in room 12, Ladies' Hall.

1. Musical Theory and Choral Practice. *Two hours a week. Throughout the year; Tu., Th., at* 5. Professor PARKER.

2. Elementary Harmony. *Two hours a week. Throughout the year; Tu., Th , at* 4. Professor PARKER.

3. Advanced Harmony. Three hours a week. *First semester; Tu., W., Fr., at* 10. Professor PARKER.

4. Counterpoint. Three hours a week. *Second semester; Tu., W., Fr., at* 10. Professor PARKER.

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. Professor PARKER.

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

SCHOOL OF ECONOMICS, POLITICAL SCIENCE, AND HISTORY.

CORPS OF INSTRUCTION.

CHARLES KENDALL ADAMS, LL. D., President of the University.
RICHARD T. ELY, PH. D., LL. D., Director, and Professor of Political Economy.
JOHN B. PARKINSON, A. M., Professor of Constitutional and International Law.
FREDERICK J. TURNER, PH. D., Professor of American History.
CHARLES H. HASKINS, PH. D., Professor of Institutional History.
WILLIAM A. SCOTT, PH. D., Associate Professor of Political Economy.
VICTOR COFFIN, PH. D., Assistant Professor of European History.
FRANK C. SHARP, PH. D., Instructor in Social Ethics.
CHARLES J. BULLOCK, A. B., Fellow in Economics.
ORIN G. LIBBY, M. L., Fellow in History.
THEODORE C. SMITH, M. A., Fellow in History.
PHILIP W. AYRES, PH. D., Special Lecturer on Pauperism.
CHARLES M. HUBBARD, Special Lecturer on American Charities.
DAVID KINLEY, PH. D., Special Lecturer on Money and Banking.
HARRY J. FURBER, JR., PH. D., Special Lecturer on the History of American Economics.
MRS. HELEN CAMPBELL, Special Lecturer on Women's Work and Wages and Domestic Science.

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 seminaries 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. 37.

Courses in other departments may be advantageously combined with those offered in this 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. The Master's degrees and the degree of Doctor of Philosophy are conferred for work done in the School under the general regulations of the University. (See pp. 38–40.)

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 p. 57. The requirements for graduation in the course are as follows:

Freshman Year: Latin or German 4*; mathematics 4; Greek and Roman history 5, first semester; English history 5, second semester; rhetoric 2; military drill 2; gymnastics 2.

Sophomore Year: German 4; French 4; science (physics, biology, or chemistry) 5; rhetoric 2; military drill 2; gymnastics 2; elective 2.

Junior and Senior Years: Philosophy 5, one year; Latin, German, French, or Norse, one year (the German must be taken if begun in Sophomore year); synoptical lectures 1, two years; thesis 3, one semester. The remaining studies, sufficient to make 132 unit-hours, are elective, except that the equivalent of twelve hours per week for one year must be elected in history, economics, and political science.

3. Work under the Group System for students who desire to take economics, political science, or history as one of their major studies. (See pp. 67-69.)

4. 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 Class-

*The figure indicates the number of hours per week.

ical 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 18 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.

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

6. Numerous special lectures are given as occasion offers. During the present year the following lectures were given in connection with the course on American Charities:

HON. H. H. GILES, The Wisconsin State Board of Charities and Reforms.

HON. CLARENCE SNYDER, The Wisconsin State Board of Control.

PROF. A. O. WRIGHT, County Asylums and The Influence of the Wisconsin State Board of Charities and Reforms on Almshouses and Jails.

MRS. FLORENCE GRISWOLD BUCKSTAFF, Charities in Small Cities.

HON. E. O. HOLDEN, Out-door Poor Relief.

SUPERINTENDENT LYNN S. PEASE, The Blind.

SUPERINTENDENT JOHN W. SWILER, The Deaf and Dumb.

DR. ALEXANDER GRAHAM BELL, The Instruction of the Deaf by the Oral Method.

DR. W. A. GORDON, Treatment of the Insane in Hospitals.

DR. L. R. HEAD, Treatment of the Insane.

PROF. FREDERICK WILKINS, Criminal Responsibility.

PRESIDENT ALBERT SALISBURY, The Feeble Minded.

HON. LEWIS A. PROCTOR, Industrial Schools.

DR. BAYARD HOLMES, Methods of Lessening the Number of the Blind and of Mutes.

PRESIDENT JOHN H. FINLEY, The New York State Charities Aid Association.

ECONOMICS.

PROFESSOR ELY, ASSOCIATE PROFESSOR SCOTT, MR. BULLOCK.

1. The Elements of Economic Science. A study of the leading facts of the industrial revolution and modern industrial history in the first part of the semester, followed by a study of the nature and leading principles of political economy.

Ely's Outlines of Economics and Hobson's Evolution of Modern Capitalism. *Repeated each semester; M., Tu., W., at* 8. Associate Professor SCOTT and Mr. BULLOCK.

2. 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., Tu., W., at* 9 *and* 10. Associate Professor SCOTT.

3. Money and Banking. A study of the elements of money and credit operations, of the history and characteristics of the chief monetary and banking problems. 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., Tu., W., at* 9 *and* 10. Associate Professor SCOTT.

4. Practical Economic Questions. Socialism, communism, co-operation, profit sharing, labor organizations, factory legislation, and similar topics. *Second semester; M., T., W., at* 8. Mr. BULLOCK.

5. The Financial History of the United States. The financial legislation and experience of the United States, including the finances of the Colonies and the Revolutionary epoch. (Not given 1895-96.)

6. The Distribution of Wealth. This course deals chiefly with the fundamental institutions in the existing social order and their relation to the present distribution of wealth. The principal topics discussed are: Private property, contract and its conditions, vested interests, custom, competition, monopoly, authority, and the caritative principle. *Throughout the year; M., Tu., at* 3. Open to graduate students and undergraduates who have had suitable preparation. Professor ELY.

7. History of Economic Thought. The principal topics will be the following: The history of economic theories in classical antiquity; their development under the influences of the Christian era and the Middle Ages to the time of the Mercantilists; the rise and growth of economics as a distinct branch of social science with a brief discussion of existing schools of economic thought.

This course is designed for undergraduates who have had the elementary work in economics in Course 1, and for graduates who have not had a course in the history of economic thought. *Second semester; M., W., at* 2. Professor ELY.

8. Theories of Value. History of theories of value down to the present day. Especial attention is given to the writings of the Austrian Economists. The seminary method of instruction is employed, and each student is expected to study critically the writings of the theorists examined. *First semester; Tu., Th., a* 12. Associate Professor SCOTT.

9. Theories of Rent, Wages, Profits, and Interest. A critical study of the history of these theories conducted in the manner described in the previous course. *Throughout the year; Tu., Th., at* 12. Associate Professor SCOTT. (Not given in 1895-96.)

10. Theories of Production and Consumption. Theories of social prosperity as seen in the writings of economists on the subject of production and consumption. Theories 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. Special attention is given to the writings of Professor Simon N. Patten on these subjects. *Second semester. Tu., Th., at* 12. Associate Professor SCOTT.

11. Public Finance. A discussion of the revenues and expenditures of government with a sketch of their historical development. Open to graduates and advanced students. *First semester; M., Tu., W., at* 4. Professor ELY.

12. American Public Finance. A brief examination of the Finances of the Federal government, followed by a more detailed study of the finances of the American commonwealths, and local political units. Open to graduates and advanced students. *Second semester; M., Tu., W., at* 4. Professor ELY.

13. The Economics of Agriculture. A discussion of those economic topics which are of especial interest and importance to farmers. This course is designed primarily for the students of the College of Agriculture, though any student may be admitted. Lectures and text-book work. *Two hours per week from January 1st to April 1st.* Associate Professor SCOTT.

14. 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. Associate Professor SCOTT.

15. 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 of the year. The subject for 1895–96 will be for the first semester, the Theories of English Socialists; for the second semester, the Theories of German Socialists.

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 and Associate Professor SCOTT.

16. Synoptical Lectures. A series of weekly synoptical lectures on economics is given in 1894–95; will be repeated during 1896–97.

SOCIOLOGY.

PROFESSOR ELY AND DR. SHARP, ASSISTED BY SPECIAL LECTURERS.

1. The Elements of Sociology. *Three times a week for one semester.*
2. American Charities and Crime. This is an elementary course designed not to make specialists of students, but to prepare them for good citizenship by giving them an intelligent interest in charitable and correctional work. An important feature of this course is the assistance given by men and women who have devoted special attention to some phase of charitable and correctional work. Some twenty special lecturers have given valuable assistance during the winter term 1895. The text-books are Warner's American Charities and Wines' Punishment and Reformation. *First semester; M., Tu., W. at* 2. Professor ELY.
3. 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 the past summer four students from the University of Wisconsin, two of whom were aided by scholarships, engaged in field work under the direction of Dr. P. W. Ayres, of Cincinnati, where they were within easy reach of the charitable and correctional institutions of three states. Two of these students have taken up work of this kind as a career. Chicago also affords 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.

4. Social Ethics. The connection between ethics and economics and the ethics of economic relations. *Second semester; twice a week.* Professor ELY. (Omitted in 1895-96.)

5. Social Ethics. *First semester; Tu. and Th. at* 10. (Omitted in 1895-96.) Dr. SHARP.

6. Readings in German Social Philosophy. The object of this course is to assist students in learning to read German writers readily and to familiarize them with some of the more important recent scientific works. At present the class is reading Professor R. von Ihering's Zweck im Recht. *Second semester ; twice a week.* Dr. SHARP.

7. Socialism. A critical examination of its nature, strength, and weakness. Text-book, Ely's Socialism and Social Reform. *First semester; twice a week.* Professor ELY. (Will not be given in 1895-96.)

8. Women Wage-earners. *Second semester; once a week.* Mrs. HELEN CAMPBELL.

9. Domestic Science. *Second semester; once a week.* Mrs. HELEN CAMPBELL.

PUBLIC ADMINISTRATION.

(THE NAME OF THE INSTRUCTOR WILL BE ANNOUNCED LATER.)

1. Principles of Administration. This course aims to give a brief outline of the principles of administration, followed by a comparative study of the administrative law of the United States and leading states of Europe, with special reference to the organization of state and of provincial departments. *First semester; M., Tu., F., at* 2. This course is for Seniors and graduates.

2. Municipal Organization. An examination of the municipal systems of the leading states of Europe and the various systems prevailing in the American states. This course has in view a comparative study of the relations and powers of organs as they appear in important modern municipal systems. *Second semester; M., and W., at* 2. For advanced students, graduates and undergraduates.

3. Municipal Administration. Municipal government will be considered, following as closely as possible the seminary method, with the statistical and administrative reports of the larger cities of Europe and America as sources. The problems discussed will be municipal budgets, systems of communication and lighting, dwellings problem, distribution of population, etc. *Second semester; F., at* 2. For advanced students, graduates and undergraduates.

POLITICAL SCIENCE.

PROFESSOR PARKINSON.

1. Elementary Law. A general view of the whole field of law—of its terminology and leading principles. *Both semesters; Tu., Th., at* 10.

2. Constitutional Law. A brief outline of the growth of constitutional law in the United States prior to the adoption of the present constitution, followed by a study of the text of the constitution in the light of judicial interpretation. *Both semesters; Tu., Th., at* 9.

3. Constitutional Law. A continuation of Course 2. A closer study will here be made of the more important parts of the constitution of the United States, especially of the amendments—of their nature, scope, and influence as a bill of rights. An examination of leading cases will be made prominent. *Both semesters; M., W., Fr., at* 9.

4. Comparative Constitutional Law. A study, by comparative methods, of the constitutions of the leading nations, and of the salient features of their government and administration. Lectures, papers, and discussion, with collateral reading. Open to graduate students and Seniors of suitable preparation. *Both semesters; Tu., Th., at* 11.

5. Roman Law. The object of this course is to trace the more important steps in the development of the Roman law, but to give chief attention to the law in its later form, as codified by Justinian. *First semester; M., W., Fr., at* 10.

6. International Law. A brief examination of the nature and sources of international law, public and private, and a study of its growth, improvement, and present status as brought about by the extension of commerce and civilization. *Second semester; M., W., Fr., at* 10.

7. Political Science Seminary. A two-hour seminary will be conducted fortnightly, during both semesters, in public law and comparative jurisprudence. Open to advanced students only.

HISTORY.

PROFESSOR TURNER, PROFESSOR HASKINS, ASSISTANT PROFESSOR COFFIN, MR. LIBBY, AND MR. T. C. SMITH.

1. Ancient History. A brief outline of Oriental history, and a more particular study of the history of Greece and Rome. (a) For Freshmen in the Ancient Classical and Modern Classical courses. *Throughout the year; Tu., Th., at* 9. (b) For Freshmen in the Civic-Historical Course. *First semester; M., Tu., W., Th., F., at* 10. (c) For Freshmen in the English Course. *Second semester; M., Tu., W., Th., F., at* 10. Professor HASKINS, Mr. LIBBY, and Mr. T. C. SMITH.

2. English History. Political and social history of England from the earliest period to the present time. Text-book, lectures, topics. For Freshmen in the Civic-Historical and English courses. (a) English Course. *First semester; M., Tu., W,, Th., F., at* 9. (b) Civic-Historical Course. *Second semester; M., Tu., W., Th., F., at* 9. Assistant Professor COFFIN.

3. History of the Middle Ages. Political and social history of continental Europe from the barbarian invasions to the Renaissance. *Throughout the year; W., F., at* 11. Designed for Sophomores and Juniors; should precede Courses 5, 6, and 10. Professor HASKINS.

4. American History. A general survey with emphasis on political history. The course may be elected by separate semesters.
   a. To the close of the War of 1812. *First semester; Tu., Th.,* 11.
   b. From the close of the War of 1812 to the present time. *Second semester; Tu., Th.,* 11. Professor TURNER.

5. Modern European History. Beginning with the Renaissance and extending to the French Revolution. Text-book, co-operative topical work, and lectures. *First semester; M., T., W., Th., F., at* 11. Assistant Professor COFFIN.

6. History of the Nineteenth Century. This course covers the period from 1789 to the present time, and is designed to enable the student to understand current events by show-

ing their connection with recent history. Text-book, lectures, topics. *Second semester; M., T., W., Th., F., at* 11. Assistant Professor COFFIN.

7. Economic and Social History of the United States. Particular attention will be paid to the advance of settlement across the continent, and to the economic and social results of this movement. The course should be preceded by Course 4 or its equivalent. *Throughout the year; M., W., Th., at* 12. Professor TURNER.

8. Constitutional History of England. An advanced course designed for those who have had Course 2 or its equivalent. *Throughout the year; Tu., F., at* 12. Professor HASKINS.

9. History of Institutions. *First semester;* Selected topics in the early history of institutions; Greek political institutions and ideas. *Second semester:* Roman institutions. *Tu., Th., at* 11. Open to graduate students and Seniors of suitable preparation. Given in alternate years, beginning with 1894–95. In connection with this course a weekly exercise is offered on the sources and literature of Greek and Roman History. *W., at* 10. Professor HASKINS.

[10. History of Institutions. *First semester:* the political institutions of the later Roman Empire, the early Germans, and the Franks. *Second semester:* The constitutional history of France to the close of the seventeenth century. *M., Tu., Th., at* 11. Open to graduate students and Seniors of suitable preparation. Given in 1895-96. Professor HASKINS.]

11. Constitutional and Political History of the United States. From the beginning of the Colonial period to the close of the War of 1812. The subject is studied from the sources by the seminary method, combined with lectures and required reading in secondary authorities. *Throughout the year; M., W., Th., at* 2:15. Open to graduate students and Seniors of suitable preparation. Given in alternate years; omitted in 1895–96. Professor TURNER.

[12. Constitutional and Political History of the United States. From the close of the War of 1812 to the close of the Reconstruction era. *Throughout the year; M., W. Th.. at* 2:15. Open to graduate students and Seniors of suitable preparation. Given in alternate years; given in 1895–96. Professor TURNER.]

13. Advanced Modern European History. Open only to those who have had Course 5 or its equivalent. Designed for more minute work on important epochs, and conducted mainly by co-operative topical work, with lectures and collateral reading. *Second semester; ranking as a three-fifths study.* Assistant Professor COFFIN.

14. Historical Seminary. This is designed to afford training in original research. The seminary meets in two divisions:
    (a) Graduate Seminary. For conference, consideration of papers, and criticism of current historical literature. *Fortnightly throughout the year; Th.*, 4 *to* 6.
    (b) Senior Seminary. Open to those who take their senior thesis in history. *Fortnightly throughout the year; Th.*, 4 *to* 6, divided at times into separate seminaries under the various instructors.

15. Synoptical lectures are given weekly through the year 1894-95. In the fall term by Professor Haskins, on Mediæval History; in the winter term by Assistant Professor Coffin, on the French Revolution; and in the spring term by Professor Turner, on United States Political History.

WASHBURN OBSERVATORY.

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

STAFF.

GEORGE C. COMSTOCK, PH. B., LL.B., Director and Professor of Astronomy.
ALBERT S. FLINT, M. A., Assistant Astronomer.
GERTRUDE ROSS, Student Assistant, Time Service.
GEORGE V. AHARA, Student Assistant, Meteorology.
THEODORE AHARA, 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 furnishes standard time to the principal railway systems of the region in which it is situated and 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, 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. This instrument is figured in the last edition of the Encyclopædia 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 min. A floating mirror has been added to this instrument 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 Students' Observatory are mounted a six-inch equatorial telescope, by Alvan Clark and Sons, a combined transit and zenith telescope, by Fauth & Co., and 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 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 provision of law the results of important investigations conducted at the Washburn Observatory, are published by the State, and under this provision eight volumes, representing the more important work done at the Observatory, have been issued. A ninth volume is now in press.

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 93 and 139.

COLLEGE OF MECHANICS AND ENGINEERING.

CORPS OF INSTRUCTION.

CHARLES K. ADAMS, LL. D., President of the University.
STORM BULL, M. E., Professor of Steam Engineering.
JOHN E. DAVIES, A. M., M. D., LL. D., Professor of Electricity and Magnetism, and Mathematical Physics.
SAMUEL B. FORTENBAUGH; M. M. E., Assistant Professor of Electrical Engineering.
DUGALD C. JACKSON, C. E., Professor of Electrical Engineering.
FORREST R. JONES, M. E., Professor of Machine Design.
CHARLES I. KING, Professor of Mechanical Practice.
EDWARD R. MAURER, B. C. E., Assistant Professor of Pure and Applied Mechanics.
ARTHUR W. RICHTER, M. E., Assistant Professor of Experimental Engineering.
FREDERICK E. TURNEAURE, C. E., Professor of Bridge and Hydraulic Engineering.
NELSON O. WHITNEY, C. E., Professor of Railway Engineering.
JOHN G. D. MACK, M. E., Instructor in Engineering.
LEONARD S. SMITH, B. C. E., Instructor in Engineering.
JAMES R. YOUNG, B. S., Instructor in Engineering.
G. ADOLPH GERDTZEN, B. S., Alumni Fellow in Mechanical Engineering.
JAMES HIGGINS, Foreman of Foundry.
WILLIAM LOTTES, Foreman of Blacksmith Shop.
ARTHUR R. SAWYER, A. B., Assistant in Wood Shop.
ALBERT R. HAGER, Student Assistant in Wood Shop.
ELLIS E. DILLON, Student Assistant in Wood Shop.
ARTHUR L. GODDARD, Student Assistant in Machine Shop.

EDWARD CHYNOWETH, Professor of Military Science and Tactics.
GEORGE C. COMSTOCK, PH. B., LL. B., Professor of Astronomy.
WILLIAM W. DANIELLS, M. S., Professor of Chemistry.
DAVID B. FRANKENBURGER, A. M., Professor of Rhetoric.
HOMER W. HILLYER, PH. D., Assistant Professor of Organic Chemistry.
WILLIAM H. HOBBS, PH. D., Assistant Professor of Mineralogy and Petrology.
AMOS A. KNOWLTON, A. M., Assistant Professor of Rhetoric.
EDWARD T. OWEN, A. B., Professor of French.
WILLIAM H. ROSENSTENGEL, A. M., Professor of German.

CHARLES S. SLICHTER, PH. D., Professor of Applied Mathematics.
BENJAMIN F. SNOW, PH. D., Professor of Physics.
CHARLES R. VAN HISE, PH. D., Professor of Geology.
CHARLES A. VAN VELZER, PH, D., Professor of Mathematics.
LOUIS W. AUSTIN, PH. D., Instructor in Physics.
LUCY M. GAY, B. L., Instructor in French.
ARTHUR P. SAUNDERS, PH. D., Instructor in Chemistry.
HERMAN SCHLUNDT, B. S., Assistant in Chemistry.
ERNEST B. SKINNER, A. B., Instructor in Mathematics.
SUSAN A. STERLING, B. L., Instructor in German.
CHARLES B. THWING, PH. D., Instructor in Physics.

Special Lecturers.

ARTHUR V. ABBOTT, C. E., Chief Engineer of the Chicago Telephone Co. Lecturer on the Electric Transmission of Power. Chicago, Ill.

W. E. BAKER, Chief Engineer Metropolitan Elevated Railway Co. Lecturer on Electric Equipment for Elevated Railways. Chicago, Ill.

ALEXANDER GRAHAM BELL, Lecturer on Radiophony. Washington, D. C.

G. E. BENZENBERG, C.E., City Engineer. Lecturer on Milwaukee Water Supply Tunnel. Milwaukee, Wis.

H. G. BROWNELL, B. S., Designer, Geo. E. Lloyd & Co. Lecturer on The Operations of Galvanoplasty. Chicago, Ill.

L. E. COOLEY, C. E., Trustee Sanitary District of Chicago. Lecturer on Deep-Water Way from the Great Lakes to the Atlantic. Chicago, Ill.

L. A. FERGUSON, S. B., Electrical Engineer Chicago Edison Co. Lecturer on Modern Electric Power Stations. Chicago, Ill.

H. McC. GRAFTON., C. E., Signal Engineer. Penna. Lines west of Pittsburg. Lecturer on Railway Signaling. Pittsburg, Pa.

J. B. JOHNSON, C. E., Professor of Civil Engineering Washington University. Lecturer on The United States Timber Tests. St. Louis, Mo.

F. H. LEWIS, C. E., Consulting Engineer. Lecturer on The Specifications and Tests for Structural Steel, and Specifications and Tests for Cement. Phila., Pa.

AUGUST LINDEMANN, M. E., Superintendent, J. Lindeman & Sons. Lecturer on Presses and the Die and Tool Work connected therewith. Milwaukee, Wis.

L. F. LOREE, C. E., Superintendent Penna. Co. Lecturer on Emergencies Arising in the Operation of Railroads. Cleveland, O.

DANIEL W. MEAD, B. C. E. Lecturer on Water Supply Engineering. Rockford, Ill.

S. B. PECK, M. E., Consulting Engineer of the Link Belt Machinery Co. Lecturer on Conveying Machinery. Chicago, Ill.

JOHN E. SWEET, Pres., Straight Line Engine Co. Lecturer on the Modern Steam Engine. Syracuse, N. Y.

ORGANIZATION OF THE COLLEGE.

The College of Engineering is organized in the belief that 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 advisable, 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 later 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 three systematic courses, as follows:

One in CIVIL ENGINEERING.

One in MECHANICAL ENGINEERING.

One in ELECTRICAL ENGINEERING.

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, and electrometallurgy.

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 examinations will be held on Thursday and Friday, June 13 and 14, beginning at 9 A. M. The later examinations will be held on Tuesday and Wednesday, September 24 and 25, beginning at 9 A. M. Examinations will also be held on the opening day of the winter and spring terms. 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: Gage or Avery, with laboratory work.

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

Botany: Gray's Lessons, with plant analysis and description.

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 the 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 examinations.

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.

DEGREES.

The University confers upon the graduates in the Engineering courses the degrees of Bachelor of Science in Civil, Mechanical, or Electrical Engineering.

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.

Libraries.

The library facilities of the University are very great. Besides the University library containing more than 32,000 volumes, of which a good share are books pertaining to the engineering profession, there are the library of the State Historical Society (150,000 volumes) and the City free library (13,000 volumes) to which the students have free access. The College of Mechanics and Engineering subscribes for seventy-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.

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 Olson 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, and a large grinding wheel for preparing brick and stone specimens for testing. The machines in the Testing Laboratory are also used for testing brick, stone, and cement.

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, 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, 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 new 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; 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 engine.

For elementary instruction in the Electrical Laboratory, the electrical apparatus of the Physics Department is available. The electrical laboratory is also well supplied with exact scientific and commercial instruments, and is arranged for instruction and investigation. With the additional 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 multiphase alternating current generation and distribution, and commercial electrochemistry. The dynamos in the laboratory are arranged in a large special room, with a special engine of exceedingly close speed regulation. For use in testing dynamos, all necessary apparatus, including a Brackett cradle dynamometer is at hand. A photometer room is well arranged for the commercial comparisons of arc and incandescent lamps, or for scientific investigations.

The Assay Laboratory, situated in the south part of the basement 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 Machine Shop affords excellent facilities for mechanical practice. It embraces a main machine room properly equipped; a room containing smaller machines; 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 been increased nearly three-fold during the past year to provide for the rapid increase in the number of students entering the classes of the Engineering school.

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 surveying instruments include a sufficient number of transits and theodolites, with several solar attachments; engineer's wye and dumpy levels; and sextants, compasses, aneroids, chains, steel tapes, leveling rods of various patterns, and all needful accessories.

The standards of weights and measures belonging to the state are kept in the laboratories, and all official comparisons are made here.

EXPENSES.

Tuition for residents of the State of Wisconsin,	FREE.
Tuition for non-resident students—per semester,	$15.00
General fee—first semester,	20.00
General fee—second semester,	20.00
Engineering 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. 59.

Rooms, furnished and unfurnished, can be obtained in the city at reasonable rates. The cost of board in clubs is from $2.00 to $3.50 per week; in private families from $2.50 to $4.00 per week.

COURSES OF STUDY.

CIVIL ENGINEERING COURSE.

Freshman Year.

FIRST SEMESTER.—French, 1*, (5) †, or German, 9, (5); Rhetoric, 1, (3); Mathematics, 1, (5); Topographical Engineering, 1, (4); Mathematics, 8, (4).

SECOND SEMESTER.—French, 1, (5), or German, 9, (5); Rhetoric, 2, (3); Mathematics, 2 and 3, (5); Mathematics, 8, (3); Shop-work, 1, 3, 6, (5).

Sophomore Year.

FIRST SEMESTER.—Mathematics, 3, 4, 5, (6½); Physics, 1, 2, (5); Chemistry, 1, (5); Mineralogy, 1, (2); Topographical Engineering, 2, (2½).

SECOND SEMESTER.—Mathematics, 4, (3½); Physics, 1, 2, (4); Chemistry, 2, (2); Machine Design, 3, (3); Mechanics, 1, (5); Topographical Engineering, 3, (3½).

Junior Year.

FIRST SEMESTER.—Mechanics, 2, 3b, 5, (9½); Steam Engineering, 5, 7, (3); Structural Engineering 1, 2a, (4); Railway Engineering, 1, 2, (5).

SECOND SEMESTER.—Mechanics, 4b, (4); Astronomy, 5, 6, (4); Structural Engineering, 2b, 5a, 7a, (8½); Railway Engineering 3, (2); Topographical Engineering, 4, (2); Topographical Engineering, 5, two weeks (120 hours).

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* The language of the Freshman year must be the same as that offered for the entrance examination.

† The figure in parentheses denotes the number of hours per week. For descriptions of the various courses see pp. 136-159.

Senior Year.

FIRST SEMESTER.—Structural Engineering, 3, 4, 5b, 6, 7b, (9); Railway Engineering, 4, (2); Geology, 1, (5); Municipal Engineering, 1, (3); Elective (2), in Railway, Structural, Geodetic, or Municipal Engineering.

SECOND SEMESTER.—Structural Engineering, 4, (3); Railway Engineering, 6, (2); Rivers and Canals, 1, (1½); Municipal Engineering, 2, 4, (4½); Geology, 5, (2); Laws of Corporations and Contracts, (1); Elective, (4), in Railway, Structural, Geodetic, or Municipal Engineering; Thesis; Topographical Engineering, 5, two weeks (120 hours).

Graduate Courses.

For graduate students and students desiring to specialize, opportunity is offered in the elective courses and in courses arranged on consultation with the instructors, for advanced study in railway, structural, municipal, or geodetic engineering, and for special laboratory investigations.

MECHANICAL ENGINEERING COURSE.

Freshman Year.

FIRST SEMESTER.—Mathematics, 1, (5); Mathematics, 8, (5); German, 9, (5), or French, 1, (5); Rhetoric, 1, (3); Shop-work, 1, 2, (2½).

SECOND SEMESTER.—Mathematics, 2 and 3, (5); Mathematics, 8, first nine weeks, (5); German, 9, (5), or French, 1 (5); Rhetoric, 2, (3); Shop-work, 2, 3, 4, (2½); Machine Design, 1, last nine weeks, (5.)

Sophomore Year.

FIRST SEMESTER —Mathematics, 3, 4, (5); Physics, 1, 2, (5); Chemistry, 1, (5); Machine Design, 2, (3 ; Shop-work, 5, 6, (3).

SECOND SEMESTER.—Mathematics, 4, 6, (5); Physics, 1, 2, (5); Mechanics, 1, (5); Chemistry, 2, (3); Machine Design, 3, (3).

Junior Year.

FIRST SEMESTER.—Mechanics, 3a, 4a, 5, (6½); Steam Engineering, 1, 2, 6, (5); Machine Design, 4, (6); Shop-work, 7, (3½).

SECOND SEMESTER.—Steam Engineering, 2, 3, 6, (8); Machine Design, 5, (7); Shop-work, 8, 9, (5); Contracts, (1).

Senior Year.

FIRST SEMESTER.—Steam Engineering, 3, 6, (6); Machine Design, 6, (7); Electrical Engineering, 1, (5); Shop-work, 10, (3).

SECOND SEMESTER.—Hydraulic Engineering, 1, 2, (4); Machine Design, 6, (7), for eight weeks; Steam Engineering, 3, 6, (5), for eight weeks; Shop-work, 11, (5), Thesis.

Graduate Courses.

Graduate students will be received in the Department of Mechanical Engineering, and opportunity for advanced study in machine design and steam engineering will be given by the professors in charge.

ELECTRICAL ENGINEERINC COURSE.

Freshman Year.

The same as the Mechanical Engineering Course.

Sophomore Year.

FIRST SEMESTER.—Mathematics, 3, 4, (5); Physics, 1, 2, (5); Chemistry, 1, (5); Machine Design, 2, (3); Shop-work, 5, 6, (3).

SECOND SEMESTER.—Mathematics, 4, 6, (5); Mechanics, 1, (5); Physics, 1, 2, (4); Chemistry, 2, (4); Machine Design, 3, (3).

Junior Year.

FIRST SEMESTER.—Mechanics, 3a, 4a, (5); Physics, 5, (3); Electrical Engineering, 1, (5); Machine Design, 4, (6); Shop-work, 7, ($2\frac{1}{2}$).

SECOND SEMESTER.—Mechanics, 5, ($1\frac{1}{2}$); Steam Engineering, 4, 6, (5); Electrical Engineering, 1, 2, (5); Machine Design, 5, (7); Shop-work, 8, 9, (3).

Senior Year.

FIRST SEMESTER.—Steam Engineering, 3, 6, (5); Electrical Engineering, 2b, 3, 4, 6b, (11); Machine Design, (6).

SECOND SEMESTER.—Hydraulic Engineering, 1, 2, (4); Electrical Engineering 4, 5, 6a, 6c, (11); Contracts, (1); Thesis.

Graduate Courses.

Graduates and advanced students are offered instruction in advanced design and experimental investigations relating to electrical engineering as more fully explained in pages 149 to 152.

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, or Machine Design, 1.

Sophomore Year.

Mathematics, all courses; Physics, 1 and 2; Topographical Engineering, 2 and 3, or Machine Design, 2, 3, and 4; 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 AND MISS GAY.

1. Elementary Course. Otto's French Conversation Grammar, Roman d'un Jeune Homme Pauvre, La Petite Fadette (the former read mainly and the latter altogether independently of the class room). Additional material for translation will be assigned as the progress of the class allows. *Throughout the year; M., Tu., W., Th., F., at* 11. Miss GAY.

   As many students desire a reading knowledge only, the effort of the above is concentrated upon reading. Students are expected, at the end of the course, to read with sufficient ease and accuracy to make a practical use of French text-books in the prosecution of their other studies.

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, lectures in French on the history of the language and recitations in French on the same, lectures in French on the early literature of the language, recitations in French from Demogeot's History of French Literature, reading independently for examination an abridgment of Les Trois Mousquetaires of Dumas and other easy French to be assigned.

5. Advanced Reading and Syntax. Reading in class parts of Cinq-Mars, Ursule Mirouet, Travailleurs de la Mer, La Fontaine's Fables, etc., reading independently for examination the Histoire de Charles XII. and other easy French to be assigned.

   Courses 4 and 5 are combined, each occupying the time of a half study for two years. Professor OWEN.

   Required of those Freshmen who do not elect German.

GERMAN.

PROFESSOR ROSENSTENGEL AND MISS STERLING.

Engineering Courses. The aim 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.

9. German Science Reader, *first semester*, and Scientific Monographs, *second semester*. *M., Tu., W., Th., F., at* 11 *and* 12. Miss STERLING.
Required of Engineering Freshmen.

RHETORIC AND ORATORY.

ASSISTANT PROFESSOR KNOWLTON AND MR. SAUNDERSON.

1. Genung's Outlines of Rhetoric; Paragraph Formation. Reading and criticism of short masterpieces illustrative of leading literary types. Exercises in composition, with criticism of the same before the class; two themes embodying the principles of description and narration. *First semester; M., W., F., at* 11 *and* 12. Assistant Professor KNOWLTON.
Required of Freshmen in Engineering.

2. Spencer's Philosophy of Style. Composition at sight. Two themes in exposition and argumentation; practical exercises in describing engineering structures and machines. *Second semester; M., W., F., at* 11 *and* 12. Assistant Professor KNOWLTON.
Required of Freshmen in Engineering.

3. Elocution. Voice training and plain reading and speaking of the kind most needed by business and professional men. Lectures upon the use and care of the voice, and upon the principles of effective reading and speaking. *First semester; three times a week.* Mr. SAUNDERSON.
Elective for Engineers.

MATHEMATICS.

PROFESSOR SLICHTER, MR. SKINNER, MR. MACK, AND MR. SMITH.

1. Algebra. The course includes progressions, arrangements and groups, binomial 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 and Mr. SKINNER.

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 Mr. 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. Required of Sophomores in Engineering. Professor SLICHTER and Mr. SKINNER.

4. Calculus. *Part of first semester, M., Tu., W., Th., F., at* 8, *and second semester, M., Tu., W., Th., F., at* 8 *and* 9 (*136 hours in class-room*). Professor SLICHTER and Mr. SKINNER.

Required of Sophomores in Engineering.

5. Spherical Trigonometry. *Part of first semester; Tu., Th., S., at* 11 (*30 hours in class-room*). Professor SLICHTER.

Required of Sophomores in Civil Engineering.

6. Differential Equations. *Part of second semester; M., Tu., W., Th., F., at* 8 *and* 9 (*24 hours in class-room*). Professor SLICHTER.

Required of Sophomores in Mechanical and Electrical Engineering.

7. Differential Equations. Besides the integration of the simpler forms of differential equations in continuation of Course 6, this course will include such other topics in analysis as are most needed by engineering students. *Three times a week throughout the year. Hours to be announced.* Professor SLICHTER.

Elective for Juniors in Engineering.

8. 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. Mr. MACK and Mr. SMITH.

FIRST SEMESTER.

Section I. *Tu.*, *Th.*, 11; *F.*, 8-10; *S.*, 9–1.
Section II. *M.*, *W.*, *F.*, 2–4; *Tu.*, *Th.*, 2 *and* 3.
Section III. *M.*, *W.*, 8; *Tu.*, *Th.*, 8–10.

SECOND SEMESTER.

Section I. *Tu.*, *Th.*, 8; *M.*, *W.*, *F.*, 8–10; First nine weeks.
Section II. *M.*, *Tu.*, *W.*, *Th.*, *F.*, 2–4; First nine weeks.
Section III. *Tu.*, 9; *Tu.*, *Th.*, 2–4; First nine weeks, and *Tu.*, 8; *M.*, *W.*, 8–10; Last nine weeks.

Required of Freshmen in Engineering.

PHYSICS.

PROFESSOR SNOW, DR. AUSTIN, AND DR. THWING.

1. General Lectures. *Throughout the year; M., W., at* 12. *Also one recitation, F., or S., hour to be assigned.* Professor SNOW.

   Required of Sophomores in Engineering.

2. Introductory Physical Laboratory Practice for Electrical, Civil, and Mechanical Engineers. *First semester; Tu., Th.*, 9–1. *Second semester; W., F.*, 2–4. DR. AUSTIN and DR. THWING.

   The Introductory Physical Laboratory is open daily, except Saturday, in the afternoon. Students may therefore make other arrangements to time, if more convenient.

   Required of Sophomores in Engineering.

5. 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. Professor SNOW.

   Required of Juniors in Electrical Engineering.

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.

Required of Juniors in Civil Engineering.

CHEMISTRY.

PROFESSOR DANIELLS, ASSISTANT PROFESSOR HILLYER, DR. SAUNDERS, AND MR. SCHLUNDT.

1. Descriptive Inorganic Chemistry. Lectures and laboratory work. *First semester; M., Tu., W., Th., F.*, 2-4. Professor DANIELLS and Dr. SAUNDERS.

2. (a) Qualitative Analysis to Easter recess.
(b) Quantitative work in the determination of the equivalence of elements and quantitative analysis. Gas Analysis, or Sanitary Water Analysis. Laboratory work after Easter recess.

Or (c) Descriptive Organic Chemistry, lectures, and laboratory work, last nine weeks of second semester.

Second semester: M. E., *Tu., Th.*, 11-1; *Tu.*, 2-4; E. E., *M., Th.*, 2-4; *F.*, 2-6; C. E., *first eight weeks, M.*, 2-4; *T., Th.*, 11-1, *and* 2 *to* 4. Professor DANIELLS, Assistant Professor HILLYER, Dr. SAUNDERS and Mr. SCHLUNDT.

Required of Sophomores in Engineering.

MINERALOGY.

ASSISTANT PROFESSOR HOBBS.

1. Short Course in Mineralogy. In this connection the determining characteristics of the common minerals are taken up and students are given as much familiarity with the appearance of minerals as the time allows. *First semester; Tu., F.*, 12.

Required of Sophomores in Civil Engineering.

GEOLOGY.

PROFESSOR VAN HISE.

1. General Geology. The geological forces and the work they accomplish; the geography of the continents; the effects of land relief, water areas and rivers upon the distribution of peoples; rocks and their original and secondary

structures; a series of synoptic lectures on historical geology. Text-book, Geikie's Class Book of Geology. *First semester; M., Tu., W., Th., F., at* 12.

Required of Seniors in Civil Engineering.

5. Applied Geology. Treats of the geology of potable water, structural materials, soils, mineral fuels, and ore deposits. A report upon an assigned topic is required of each student. Must be preceded by Course 1. *First six weeks of second semester, M., Tu., W., Th., F., at* 12.

Required of Seniors in Civil Engineering.

APPLIED MECHANICS.

ASSISTANT PROFESSOR MAURER, ASSISTANT PROFESSOR RICHTER, AND MR. SMITH.

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., T., W., Th., F., at* 8 *and* 9. Assistant Professor MAURER and Mr. SMITH.

Required of Sophomores in Engineering.

2. Graphic Statics. Covers the following general subjects: (1) General theory of graphic statics, being a development from first principles, by graphic methods, of the main principles of statics of complanar forces. (2) Application to 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, as part of which the student is required to make, graphically, the computations which form the basis of problems in roof design to be completed later. *First semester* (108 *hours in draughting room*); *M., W., F.,* 8–10. Assistant Professor MAURER.

Required of Juniors in Civil Engineering.

3. Strength of Materials.

(a) 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* (70 *hours in class room*); *M., Tu., W., Th., F., at* 11 *and* 12. Assistant Professor MAURER.

Required of Juniors in Mechanical and Electrical Engineering.

(b) Consists of 3a with 20 hours additional devoted to further study of combined stresses, column formulas, and the theorem of three moments. *First semester* (90 *hours in class-room*); *M., Tu., W., Th., F., at* 12. Assistant Professor MAURER.

Required of Juniors in Civil 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. *First semester* (20 *hours in class room*); *M., Tu., W., Th., F., at* 11 *and* 12. Assistant Professor MAURER.

Required of Juniors in Mechanical and Electrical Engineering.

(b) Same as 4a with the following additional: Measurement of water power, short study of hydraulic motors, and laboratory work. *Second semester* (3 *hours per week for* 16 *weeks in class room*); *M., W., F., at* 12; (32 *hours in laboratory*); hours to be assigned. 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; M. and W.*, 2-5. Required of Juniors in Mechanical and Civil Engineering. *Second semester; Tu., Th.*, 8-10. Required of Juniors in Electrical Engineering. Assistant Professor RICHTER.

6. Graphics. The application of graphic methods of analysis in various departments of mechanics, especially in the subject of simple and compound stresses in elastic solids. *Second semester, twice a week;* hours to be assigned. Open to graduate students and to students who have completed 1, 2, 3a, or 3b Assistant Professor MAURER.

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., and W.*, hours

to be assigned. Open to graduate students and to those students who have completed Course 5. Assistant Professor RICHTER.

TOPOGRAPHICAL AND GEODETIC ENGINEERING.

MR. SMITH.

1. Elementary Drawing. Instruction is given in free hand lettering of working of drawings, followed by pen topography, brush shading, and the conventional signs used in map drawing. *First semester; Tu., W., Th., F.*, 2–4.
Required of Freshmen in Civil Engineering. Mr. SMITH.

2. Elementary Surveying. The principles of the instrumental adjustments are first studied; after which practical problems in land surveying and profile leveling are worked. Taught partly in the lecture room, drawing room, and in the field. *First semester; first nine weeks; recitations, M., W., F., at* 9.

Field work, first nine weeks; { Section I, *M., W.*, 10-12. / Section II, *T., F.*, 10-12.

Mr. SMITH.

Required of Sophomores in Civil Engineering.
Elective for students in Mechanical and Electrical Engineering.

3. Advanced Surveying. This course includes a study of the higher instruments of precision, and their use in stadia, hydrographic, and mining surveying.

Second semester; { *T., F., at* 10, *first twelve weeks.* / *M.*, 2, *F.*, 10 { Section I, *Tu., Th.*, 9-1. / " II, *Tu., Th.*, 2-6. } *Last six weeks.*

Mr. SMITH.

Required of Sophomores in Civil Engineering.

4. Elementary Geodesy. A general treatment of the subject of geodetic measurements and computations, latitude, longitude, azimuth, time, and the polyconic projection of maps. *Second semester; M., W., at* 10. Mr. SMITH.
Required of Juniors in Civil Engineering.

5. Trigonometrical Survey. Each year a portion of the neighboring lake region will be covered by an accurate triangulation, and also by a topographical and hydrographical survey. It is intended that the triangulation shall be connected with the primary triangulation of the U. S. C. & G.

Survey. Begins third Monday preceding commencement and continues for two weeks (120 *hours*). Professors WHITNEY, TURNEAURE, DAVIES, and Mr. SMITH.

Required of Juniors and Seniors in Civil Engineering.

6. Advanced Geodesy. Includes the preparation of a map from the field notes of Course 5, a study of the computations and adjustments (using method of least squares where desirable) of some of the important triangles of the U. S. C. & G. Survey, also a general study of the Economics of Geodesy. Taught partly by lectures, assigned readings, and in the field. Text-book, Wright's Adjustment of Observations. *First semester.* Not given in 1895-96. Mr. SMITH.

Elective for Seniors in Civil Engineering and for graduates who have had Courses 2, 3, 4, and 5, or their equivalents.

7. Advanced Geodesy. An elaboration of Courses 4 and 6. Formulæ 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.* Not given in 1895-96. Mr. SMITH.

Elective for Seniors in Civil Engineering and for graduates who have taken Courses 2, 3, 4, and 5 or their equivalents.

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; *in the field and office.*

Required of Juniors in Civil Engineering.

2. Preliminary and Location Surveys. Class-room work to accompany Course 1. A good field book is studied part of the time. *First semester; Th., at* 11, *in the class room.*

Required of Juniors in Civil Engineering.

3. Construction and Maintenance of Way. Lectures and recitations on construction, including rock-work, explosives, tunneling, dredging, and docking; and 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* 12 ; 32 *hours in the class room.*
Required of Juniors in Civil Engineering.

4. 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; M., F., at* 9 ; 36 *hours in the class room.*
Required of Seniors in Civil Engineering.

5. Railway Standards. Continuation of Courses 3 and 4. 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; W., at* 9 *and* 2–4
Elective for Seniors in Civil Engineering.

6. 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; W., F., at* 9 ; 32 *hours in the class room.*
Required of Seniors in Civil Engineering.

RIVERS AND CANALS.

PROFESSOR WHITNEY.

1. River and Harbor Improvement and Canal Construction. Lectures and assigned readings 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., W., Th., at* 12, for the first 9 weeks; *M., F., at* 12, for the last 9 weeks (54 *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 motors, turbine wheels, hydraulic rams, and other hydraulic machinery, in connection with the determination of the coefficients of the flow of water through orifices and over weirs. Last nine weeks of the *second semester; M., Tu.*, 2-4. Assistant Professor RICHTER.
   Required of Seniors in Mechanical and Electrical Engineering.

STEAM ENGINEERING.

PROFESSOR BULL AND ASSISTANT PROFESSOR RICHTER.

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* 11 (60 *hours in class room*). Professor BULL.
   Required of Juniors in Mechanical Engineering.

2. Theory of Heat Engines and Boilers. 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 subject of injectors, condensors, air and feed pumps are taken up. The general subject of combustion and its application to steam boilers is studied, and the theoretical and practical efficiency of these is developed. 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* 11; *and second semester; M., W., F., at* 9 (72 *hours in class room*). Professor BULL.

Required of Juniors in Mechanical Engineering.

3. 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 and cut-off, 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: *First semester; Tu. and Th., at* 10; *second semester; first* 10 *weeks; M., W., F., at* 10 (66 *hours in class room*). Draughting: *Second semester, Junior year; Tu., Th., S.,* 8-10; *first semester, Senior year; Tu., Th.,* 8-10; (180 *hours in draughting room.*)

Required of Juniors and Seniors in Mechanical Engineering. Also twice a week in the class room and two hours in the draughting room of Electrical Engineering Seniors; *first semester*; *Tu., Th.,* 10, *and M.,* 8-10.

4. Short courses in Thermodynamics and the Theory of the Steam Engine and Boiler. Only the fundamental principles of thermodynamics can be touched upon in this course, but to 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; first* 10 *weeks, M., W., F., at* 8, *Tu., Th., at* 10; *last* 8 *weeks, M., W., F., at* 8, 74 *hours.* Professor BULL.

Required of Juniors in Electrical Engineering.

5. Course in Steam Engineering for Civil Engineers. In this course the stress will be laid on the steam engine, 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.*, 10; 36 *hours*. Professor BULL.

Required of Juniors in Civil Engineering.

6. 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. 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 in 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 10th week of the second 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 1st semester, Senior year.

7. 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.*, 10–12. Assistant Professor RICHTER.

Required of Juniors in Civil Engineering.

8. 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 reading of the various works on steam engineering. Open to graduate students and to those students who have completed the Courses 1, 2, 3, and 6 in Steam Engineering. *First and*

second semester; M., W., F., the hours to be assigned after consultation. Professor BULL.

9. 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. and 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.

ELECTRICAL ENGINEERING.

PROFESSOR JACKSON, ASSISTANT PROFESSOR FORTENBAUGH, AND MR. MACK.

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 Text-book on Electromagnetism and the Construction of Dynamos, Vol. I.

First semester; first nine weeks, M., W., F., at 10; *Tu., Th., at* 2; *second nine weeks, M., W., F., at* 10; *Tu., Th.*, 2-4.

Second semester; first seven weeks, S., at 12; *W., F.*, 2-6; *S.*, 8-12 (82 *hours in class room and* 86 *hours in laboratory and draughting room*). Professor JACKSON and Mr. MACK.

Required of Juniors in Electrical Engineering.

Required of Seniors in Mechanical Engineering during the first semester.

2. Applied Electrochemistry.

(a Primary and Secondary Batteries. Batteries as a source of electricity; construction and working of primary and secondary batteries, and their commercial use. Comparative and efficiency tests of various commercial types of batteries are made by the students in the laboratory. Text books: Carhart's Primary Batteries and Niblett's Secondary Batteries. *Last eleven weeks of second semester; M., W., F., at* 9, *in class room, and Tu., Th.*, 2-6, *in laboratory* (33 *hours in class room and* 44 *hours in laboratory*). Assistant Professor FORTENBAUGH.

Required of Juniors in Electrical Engineering.

(b*) Electrolysis and Electrometallurgy. The theory and application of electrolysis and electrometallurgy. The treatment of ores, electrolytic separation and refining of metals, electrotyping and electroplating are treated from the practical side. Text-book: Gore's Electrolytic Separation of Metals. Must be preceded by courses in chemistry and Course 2a. *Second half of first semester; M., W., F., at* 11, *in class room, and F.,* 2–6, *in laboratory* (27 *hours in class room and* 36 *hours in laboratory*). Assistant Professor FORTENBAUGH.

Elective for Seniors and graduate students in Electrical Engineering.

3.* Electrical Testing. Treats of the construction, testing, maintenance, and operation of lines and appliances used in telephony, telegraphy, and electric signalling. *First half of first semester. Lectures on M., W., F., at* 11. *Laboratory work F.,* 2–6 (27 *hours in class room and* 36 *hours in laboratory*). Assistant Professor FORTENBAUGH.

Elective for Seniors and graduate students in Electrical Engineering.

4. Theory and Application of Alternating Currents. The theory of the generation and utilization of alternating electric currents; the design and construction of alternating current dynamos, transformers, and motors; and methods for testing alternating current machinery. Jackson's Text-book on Electromagnetism and the Construction of Dynamos, Vol. II. (87 *hours in class room and* 96 *in laboratory and draughting room.*) *First semester; first* 9 *weeks*; *M., Tu., W., Th., F., at* 12. *Last* 9 *weeks: M., W., F., at* 12; *W., F.,* 8-10. *Second semester; first* 9 *weeks; M., W., F., at* 9; *Tu., Th.,* 8-10. Professor JACKSON.

Required of Seniors and elective for graduate students in Electrical Engineering.

5. Electric Light and Transmission of Power. A study of the manufacture and use of arc and incandescent lamps; selection and arrangement of electrical machinery for gen-

*Courses 2b, 3 and 6 are intended exclusively for students who expect to enter the field of practical electrical engineering and construction. The instruction is thoroughly practical. Students desiring to enter the field of teaching, or, for other reasons, desiring a further theoretical training, may substitute for these, and a portion of the Machine Design and Steam Engineering, the elective courses in Mathematics and Mathematical Physics, 18, 7, and 9. These electives should be chosen at the beginning of the Junior year.

erating plants; location, erection, and cost of distributing lines; and application of electric motors to the general purpose of power distribution. Lectures based on Russell's Electric Light Cables and Kapp's Electric Transmission of Energy. *Second semester; Tu., Th.*, 10; *Sat.*, at 8 (54 *hours in class room*). Professor JACKSON.

Required of Seniors and elective for graduate students in Electrical Engineering.

6. *Electricity in Engineering Operations.

(a) Electric Railways. The roadbed, 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 professors. *First half of second semester; M., Tu., W., Th., F., at* 11 (45 *hours in class room*). Professors FORTENBAUGH and WHITNEY.

(b) 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. Lectures. *First semester; Tu., at* 11 (18 *hours in class room*). Professor JACKSON.

(c) Station Management and Estimates. The 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. Lectures. *Second semester; M., W., F., at* 10 (54 *hours in class room*). Professor JACKSON.

Elective for Seniors and graduate students in Electrical Engineering.

7. Graduate Work. Advanced work as assigned after consultation. Professors JACKSON and FORTENBAUGH. (See page 44.)

Laboratory work. All 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

*See foot note page 150.

to work in the laboratories. Students are advised to use their extra time in additional work in the shops and laboratories. An opportunity will be afforded students to take Surveying as an elective study.

STRUCTURAL ENGINEERING.

PROFESSORS TURNEAURE AND WHITNEY.

1. Structural Details. The student is first required to make a detail drawing of a roof or bridge truss from his own measurements, thus familiarizing himself with the various forms of truss members and methods of connecting them. Designs are then made of the simpler forms of members and of joints in wood and iron, special attention being paid to the strength and design of riveted joints. *First semester; Tu., Th.*, 2-4. Professor TURNEAURE.
   Required of Juniors in Civil Engineering.

2. Masonry Construction and Testing of Materials.
   (a) Preparing and using the materials; foundations; theory governing the design of masonry structures, as dams, retaining walls, piers, and abutments. Text-book: Baker's Masonry Construction. *First Semester; Tu., Th., at* 9; 36 *hours in the class room.* Professor WHITNEY.
   Required of Juniors in Civil Engineering.
   (b) Testing of Portland and Rosendale cements, bricks, and stone. *Second semester; Th.*, 2–5; 48 *hours in the laboratory.* Professor WHITNEY.
   Required of Juniors in Civil Engineering.

3. Engineering Architecture. Treats of those principles of artistic design applicable to engineering structures, especially those of masonry. *First semester; six lectures in connection with Course 4.*

4. Masonry Arches and Dams. A discussion of the theory of the stability of masonry arches, both right and oblique, is followed by the complete design of an arch. A masonry dam is also designed. Specifications and estimates of cost are furnished. Three-fourths of the time is spent in the draughting room. *First semester; Tu.*, 2–5; *Th.*, 2–4; *principally in the draughting room. Second semester; Tu., Th.*, 9–12; *principally in the draughting room.* Professor WHITNEY.
   Required of Seniors in Civil 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. 54 *hours in class room.* Professor TURNEAURE.

Required of Juniors in Civil Engineering.

(b) Suspension, Swing, Cantilever, and Arch Bridges. Theory of stresses and problems. *Last half of first semester; Tu., Th.*, 10; *S.*, 8; 27 *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, deflection formulæ and stresses in redundant members, and questions relating to the designing of details. *First half of first semester; Tu., Th.*, 10; *S., at* 8; 27 *hours in class room.* Professor TURNEAURE.

Required of Seniors in Civil 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., W., Th.*, 8-10; 128 *hours in draughting room.* Professor TURNEAURE.

Required of Juniors in Civil Engineering.

(b) Riveted and Pin-Connected Trusses. *First semester; M., W., F.*, 10-12; 108 *hours in the draughting room.* Professor TURNEAURE.

Required of Seniors in Civil 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 and Construction. 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. The remainder of the course is then given up to a brief study of bridge construction, including millwork, shop-work, inspection, and erection. This instruction is given by lectures, laboratory work, and discussions. *Second semester; two-fifths study (in the class room and laboratory).* Professor TURNEAURE.

Elective for Seniors and graduates in Civil Engineering.

MUNICIPAL ENGINEERING.

PROFESSORS TURNEAURE AND 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;* 54 *hours in class room.* Professor TURNEAURE.

Required of Seniors in Civil 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;* 48 *hours in class room.* Professor TURNEAURE.

Required of Seniors in Civil Engineering.

3. Designs of Water Supply and Sewerage Systems. Complete designs and estimates of water supply and sewerage systems, and purification plants. *First semester and last* 10 *weeks of second semester;* 112 *hours in draughting room.* Professor TURNEAURE.

Elective for Seniors and graduates in Civil Engineering.

4. Roads and Pavements. Lectures and assigned readings are given on the construction and maintenance of country

roads and city pavements; and on the laying out of roads, towns, subdivisions, and parks. *Second semester; M., W., and F., at* 11; 27 *hours in the class room for first half of the semester.* Professor WHITNEY.

Required of Seniors in Civil Engineering.

5. Office Management and Records. Continuation of Course 4, with especial attention given to the duties of city and town engineers. Office records and management. *Second semester; last* 10 *weeks, M., at* 9, *and W., at* 2; 20 *hours in the class room.* Professor WHITNEY.

Elective for Seniors in Civil Engineering.

6. Biology of Water Supplies. In Biology, Courses 1 (general biology) and 23 (bacteriology) are open to graduate and special students in sanitary engineering. For a description of these courses see pp. 101, 105. Special instruction is also offered in the Summer School in the microscopical examination of water.

MACHINE DESIGN.

PROFESSOR JONES AND MR. MACK.

1. Elements of Drawing. The use of drawing instruments and plain lettering are first taught, followed by sketching of machine parts; from the sketches complete working drawings are made. The sketches are from parts of machines of practical utility, having correct proportions and outlines. The various methods of arranging the positions of the plan and elevations relatively to each other on the paper, are discussed with regard to clearness and ease of reading drawings. *Second semester; last nine weeks, M., Tu., W., Th., F.,* 8-10 *or* 2-4. *Daily* (90 *hours draughting*). Professor JONES and Mr. MACK.

Required of Freshmen 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 during this course. *First semester; M., W., F.*, 10-12, *or Tu., Th., S.*, 10-12. Mr. MACK.

Required of Sophomores in Mechanical and Electrical Engineering.

3. Constructive Materials of Engineering. The object of this study is to give a knowledge of the metallurgical processes of producing the materials that are more commonly used in machines and structures, together with the effect upon their physical properties, of change of chemical composition, mechanical working, and heat treatment. The methods of testing materials and the interpretation of results are included in the work. At the latter part of the course the manufacture of special forms, such as drop forgings, drawn work, seamless and welded tubing, balls for bearings, etc., is taken up as a means of illustrating how commercial forms are changed into specialties. *Second semester; M., W., at* 11; *Th., at* 10, *or F., at* 11 *or* 12. Professor JONES.

Required of Sophomores in Engineering.

4. Kinematics. 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 or virtual centres, is studied and applied to such machines as shapers, and to the determination of correct forms of gear teeth. Cams and belting are studied with regard to their practical conditions of working. The class room work is supplemented by a parallel course of draughting. *First semester; class, Tu., Th., at* 10; *draughting, Tu., W., Th., F.*, 8-10. Professor JONES and Mr. MACK.

Required of Juniors in Mechanical and Electrical Engineering.

5. Graphic Statics of Mechanisms and Machine Elements. An application of graphic statics to finding the external forces acting on machine members, together with a study of the outline and sectional forms best adapted to resist the forces. The elementary parts of machines, such as screw fastenings, riveted joints, journals, bearings, sliding surfaces, etc., are studied in the class room, together with

a parallel course of draughting. *Second semester; class W., F., at* 10; *draughting, M., Tu., W., Th., F.*, 11–1. Professor JONES and Mr. MACK.

Required of Juniors in Mechanical and Electrical Engineering.

6. Complete Machines. The foregoing principles are applied to the design of a complete machine. During the first part of the work the particular machine to be designed is studied in the class room with regard to the requirements that it must fulfill, the forms of its parts, and the methods of constructing them. Complete working drawings are made. After the class work relating to the machine has been completed, subjects relating to machine construction will be assigned the students, together with references to the technical journals for reading, and a digest of the matter required. Lectures and general discussions in class will accompany the journal reading. *First semester; M. E. class, W., F., at* 9; *draughting, M., Tu., W., Th., F.*, 11-1. *E. E. class, Tu., Th.*, 9; *draughting; M., Tu., W., Th.*, 2-4. Professor JONES.

Required of Seniors in Mechanical and Electrical Engineering. *Second semester; class, Tu., Th., at* 11, *and draughting, M., Tu., W., Th., F.*, 8–10, *for* 8 *weeks.* Professor JONES.

Required of Seniors in Mechanical Engineering.

SHOP-WORK.

PROFESSOR KING, MR. YOUNG, MR. DILLON, MR. HAGAR, MR. SAWYER, MR. GODDARD, MR. LOTTES, AND MR. HIGGINS.

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. (35 *hours.*) *First semester; M., W., F.*, 8-10, *and W., Th., F.*, 2-4. Professor KING, Mr. DILLON, Mr. HAGAR and Mr. SAWYER. Required of Freshmen in Mechanical and Electrical Engineering. *Second semester; M.*, 2-4; *Th., F.*, 8-10; *S.*, 9-1. 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. *First semester; M., W., F.*, 8-10, *and W., Th., F.*, 2-4 (20 *hours*). *Second semester; M., F.*, 2-4; *S.*, 11, *and M.*, 8-10; *S.*, 8-11 (20 *hours*). Professor KING and Mr. HIGGINS.

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., F.*, 2-4; *S., at* 11, *and M.*, 8-10; *S.*, 8-11, *and M.*, 2-4; *Th., F.*, 8-10; *S.*, 9-1 (50 *hours*). Professor KING, Mr. YOUNG and Mr. GODDARD.

Required of Freshmen in Engineering.

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; *S., at* 11, *and M.*, 8-10; *S.*, 8-11 (40 *hours*). Professor KING, Mr. YOUNG, and Mr. GODDARD.

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. *First semester; F.*, 10-12; *S.*, 8-12, and *M., W.*, 10-12; *S.*, 8-10; (40 *hours*). Professor KING, Mr. YOUNG, and Mr. GODDARD.

Required of Sophomores in Mechanical and Electrical Engineering.

6. Forge Work. Training in the fundamental features of forge practice, as drawing, upsetting, bending, welding, tool making, and tempering. *First semester; F.*, 10-12; *S.*, 8-12, *and M., W.*, 10-12; *S.*, 8-10 (68 *hours*). Required of Sophomores in Mechanical and Electrical Engineering. *Second semester; M.*, 2-4; *Th., F.*, 8-10; *S.*, 9-1. Required of Freshmen in Civil Engineering. Professor KING and Mr. LOTTES.

7. 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 *to* 5:30, *and M.,* 8–10; *S.,* 9–1 (126 *hours*). Professor KING, Mr. YOUNG, and Mr. GODDARD.

Required of Juniors in Mechanical and Electrical Engineering.

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. *Second semester; W., F.,* 2–6; *S.,* 10–12 (100 *hours*). Required of Juniors in Mechanical Engineering. *M., Tu.,* 2–5, *and M., Th.,* 2–5 (90 *hours*). Required of Juniors in Electrical Engineering. Professor KING and Mr. YOUNG.

9. Machine Construction. Attention is given to the cost of production. *Second semester; W., F.,* 2-6; *S.,* 10-12 (80 *hours*). Required of Juniors in Mechanical Engineering. *M., Tu.,* 2-5., *and M., Th.,* 2-5 (40 *hours*). Required of Juniors in Electrical Engineering. Professor KING.

10. 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. YOUNG, and Mr. LOTTES.

Required of Seniors in Mechanical Engineering.

11. 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. *Second semester; Th.,* 2-6; *F.,* 11-1 *and* 2-6 (180 *hours*). Professor KING.

Required of Seniors in Mechanical Engineering.

COLLEGE OF AGRICULTURE.

CORPS OF INSTRUCTION.

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.
J. A. Craig, 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., Assistant Professor of Bacteriology.
E H. Farrington, M. S., Associate Professor of Dairy Husbandry.
J. W. Decker, Agr. B., Instructor in Dairying.
W. G. Clark, V. S., Instructor in Veterinary Science.

C. R. Barnes, Ph. D., Professor of Botany.
E. A. Birge, Ph. D., Professor of Zoology.
Edward Chynoweth, Professor of Military Science and Tactics.
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.
C. I. King, Professor of Practical Mechanics.
W. H. Rosenstengel, A. M., Professor of German.
W. A. Scott, Ph. D., Associate Professor of Political Economy.
B. F. Snow, Ph. D., Professor of Physics.
C. R. Van Hise, Ph. D., Professor of Geology.
C. A. Van Velzer, Ph. D., Professor of Mathematics.
A. W. Richter, M. E., Assistant Professor of Experimental Engineering.

A. Schoenman, Instructor in Milk Testing.
F. B. Fulmer, Instructor at the Butter-worker.
L. P. Biddick, Instructor at the Separator.
J. A. Robinson, Instructor at the Separator.
Julius Berg, Instructor in Cheese-making.
John Kelty, Instructor in Cheese-making.
J. D. Clark, Instructor in Farm Dairying.
Geo. P. Pfeiffer, Instructor in Farm Dairying.
F. E. Baker, Assistant in Live-stock Judging.
O. M. Taylor, Instructor in Horticulture and Farm Book-keeping.
Fred Cranefield, Instructor in Green-house Practice.
W. A. Voigt, Assistant in Pasteurization.

STAFF OF THE FARMERS' INSTITUTES.

GEO. MCKERROW, Superintendent.
H. V. STOUT, Clerk and Stenographer.

INSTITUTE CONDUCTORS.

Corps No. 1—C. P. GOODRICH, Ft. Atkinson, Wis.
Corps No. 2—J. M. TRUE, Baraboo, Wis.
Corps No. 3—THOS. CONVEY, Ridgeway, Wis.
Corps No. 4—C. H. EVERETT, Beloit, Wis.

ASSISTANTS.

J. A. Craig, University.
J. W. Decker, University.
E. S. Goff, University.
W. A. Henry, University.
F. H. King, University.
H. L. Russell, University.
A. A. Arnold, Trempealeau Co.
A. D. Barnes, Waupaca Co.
W. D. Barnes, Outagamie Co.
W. C. Bradley, St. Croix Co.
H. A. Briggs, Walworth Co.
R. J. Coe, Jefferson Co.
W. H. Cole, Dane Co.
A. J. Decker, Fond du Lac Co.
A. J. Edwards, Fond du Lac Co.
F. C. Edwards, Jefferson Co.
Stephen Faville, Jefferson Co.
A. O. Fox, Dane Co.
Wm. Fox, Sauk Co.
Alex. Galbraith, Rock Co.
F. W. Harding, Waukesha Co.
C. H. Hamilton, Fond du Lac Co.
Chas. L. Hill, Fond du Lac Co.
Geo. C. Hill, Fond du Lac Co.
J. L. Herbst, Monroe Co.
Mrs. J. A. Jamison, Winnebago Co.
Geo. J. Kellogg, Rock Co.
Chas. Linse, La Crosse Co.
Geo. Martin, St. Croix Co.
Prof. Geo. E. Morrow, Champaign, Ill.
A. F. Noyes, Dodge Co.
H. J. Noyes, Richland Co.
L. L. Olds, Rock Co.
A. J. Philips, La Crosse Co.
Kennedy Scott, Columbia Co.
W. F. Stiles, Jefferson Co.
A. Selle, Ozaukee Co.
L. Spalding, Pierce Co.
H. C. Taylor, Rock Co.
Chas. Thorp, Dodge Co.
C. E. Tobey, Monroe Co.
T. J. VanMatre, Lafayette Co.

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.
J. A. CRAIG, Animal Husbandry.
F. W. WOLL, Assistant Chemist.
H. L. RUSSELL, Bacteriologist.
E. H. FARRINGTON, Dairy Husbandry.
J. W. DECKER, Dairying.
Miss V. M. HILL, Clerk and Librarian.

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 agricultural 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 Horticultural 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 Experiment Station, there are issued an annual report and quarterly bulletins. Ten reports and forty-three bulletins have been issued to date. Fifteen thousand copies of the report are printed annually, and the edition of the bulletins generally comprises ten thousand copies. These bulletins and reports are free to all residents of the State upon application. The Station mailing list now embraces about eight 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, animal husbandry, dairying, and other special phases of the subject. Besides the strictly professional branches it embraces chemistry, physics, botany, zoology, geology, 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 have but limited preparation and can devote only a short 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.

Course in Dairying. The terms of admission to this course will be the same as for the Short 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 the 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.

The Short Course in Agriculture is proving a very popular course for young farmers who can devote but a limited amount of time to preparatory study for their chosen vocation. The subjects of this course are elective, and will occupy the whole time of the student during the winter term of two years. The course embraces the following topics:

Thirty lectures, mainly devoted to feeds and feeding, by Professor Henry.

Thirty lectures on breeds and breeding, with practice in scoring and judging improved breeds of live-stock, by Professor Craig.

Thirty-six lectures and recitations on the elements of agricultural chemistry, by Dr. Babcock.

Sixty lectures and recitations on agricultural physics and meteorology, by Professor F. H. King.

Sixty lectures with laboratory practice in horticulture and economic entomology, by Professor Goff.

Sixty lectures with demonstrations on the anatomy, physiology, and hygiene of domestic animals by Dr. Clark.

One hundred and twenty hours at the work-bench and forge in practical mechanics, by Professor C. I. King.

Twenty-four lectures on dairying, by Dr. Babcock.

Seventy-two hours' practice in the creamery and dairy laboratory, by Mr. Clark.

Twelve lectures on the economics of agriculture, by Professor Scott.

A course in farm book-keeping by Mr. O. M. Taylor.

Six lectures, with demonstrations in bacteriology, on the relation of bacteria to the various important general questions in agriculture, by Assistant Professor Russell.

This course opens the first Monday in January of each year, continuing twelve weeks. Illustrated circulars descriptive of Short Course will be sent on application.

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 instruction twice a week in each of the three departments. The courses are arranged as follows:

1. **Lectures and Class-room Work:**

(1) Twenty-four lectures by Dr. Babcock on the constitution of milk, the conditions which affect creaming and churning, methods of milk testing, the preservation of milk, etc.

(2) Sixteen lectures with demonstrations by Dr. Russell on the influence of bacteria in the dairy.

(3) Eight lectures by Professor F. H King on heating, ventilation, and other physical problems directly connected with dairy practice.

(4) Ten lectures and demonstrations by Assistant Professor Richter on the care and management of the boiler and engine.

(5) Ten lectures by Dr. Clark on the common diseases of the dairy cow.

(6) Eight lectures by Professor Henry on the feeding and management of dairy stock.

(7) Eight lectures by Professor Craig on breeding and selection of dairy stock.

(8) Course in dairy book-keeping by Professor Farrington.

2. **Milk Testing.** This embraces instruction in the laboratory by Dr. Babcock and Mr. Schoenman in 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, and the butter extractor. 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 instructions in the manufacture of Cheddar cheese, the operations being carried on as in the regular factory, the student being required to take careful notes and make reports of the process. Sixteen hours per week.

ADVANCED DAIRY WORK.

Those pupils who have had experience before joining us, after passing examinations in the practical work of the creamery and cheese factory, will be advanced to the class in experimental dairying, where problems connected with the dairy will be studied by the class.

This instruction will consist of the following courses:

1. Instruction by Dr. Babcock on milk and its products, treating of matters beyond those taken up in the regular dairy instruction. Also experimental investigations in butter-making by Professor Farrington.

2. Advanced practical and experimental work in cheese-making by Mr. Decker.

3. Studies in bacteriology. This work will be done under the supervision of Dr. Russell, and will include two lines:

a. A special course in the preservation of milk and cream for commercial purposes. This course will include an exposition of the bacteriological principles underlying the methods of preservation and sterilization of milk and cream by heat. The student will be taught the conditions essential in the apparatus used for this purpose, the methods of manipulating the apparatus, and the way the milk and cream must be subsequently handled.

b. Students familiar with the microscope will be admitted to the bacteriological laboratory for experimental work in dairy bacteriology. This course will include a study of the various forms of bacteria present in milk, methods of isolation and cultivation of the same, and their effects on milk and its product.

EXAMINATION AND CERTIFICATES.

At intervals during the term and at its close, students are subjected to examinations, written and practical. To secure a dairy certificate, the candidate must have spent a full term in the dairy school and passed a satisfactory examination in all the courses. Further, he must have worked in a creamery or cheese factory for two full seasons of not less than seven months each. One of these seasons must follow the period spent in the dairy school. During this time the candidate must have practical charge of the factory in which he is working, and will report the operations therein fully or as directed on proper blanks furnished by the University. The University holds the right to send an authorized person to inspect the factory of the candidate. If all the conditions are satisfactorily complied with, a dairy certificate will be issued to the candidate.

On account of the expense of sending an inspector, the University does not bind itself to issue dairy certificates to students who operate factories in other states.

Like the Short Course in Agriculture this course opens the first Monday in January each year and lasts twelve weeks.

Illustrated circulars descriptive of the Dairy Course will be sent on application.

DEPARTMENTS OF INSTRUCTION.

AGRICULTURAL CHEMISTRY.

PROFESSOR BABCOCK AND ASSISTANT PROFESSOR WOLL.

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 and recitations twice a week; first semester.* Assistant Professor WOLL.

2. Analysis of Fodders, Dairy Products, and Fertilizers. *Laboratory work during the year; three times a week.* Assistant Professor WOLL.

3. 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 adulterations, etc. *Lectures, first semester; five times a week.* Professor BABCOCK.

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 and Assistant Professor WOLL.

AGRICULTURAL PHYSICS.

PROFESSOR KING.

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, 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 CRAIG.

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 farms in the vicinity of Madison; also many photographic slides projected with the electric lantern. The agricultural library now embraces over 400 volumes of stud books, herd books, and flock registers. *Full study; first semester.* Professor CRAIG.

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, text-book work, and study of the practices of breeders as shown by the various stock registries. The text-books for this subcourse are Darwin's Animals and Plants under Domestication, and Miles' Stock Breeding. *Full study; second semester.* Professor CRAIG.

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 will be used as a text-book. *Full study; first semester.* Professor HENRY.

4. Advanced Work in Feeding and Breeding. Having completed the previous subcourses the student is in position to carry on investigations through a study 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 CRAIG.

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, with the leading injurious insects and diseases that prey upon these, and the best method of preventing their ravages. Lectures, recitations, and laboratory work. *Three times a week; second semester.*

3. Æsthetic 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 Investigations 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 industrial conditions, and a knowledge of the forces which determine and modify 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, 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.

ASSISTANT PROFESSOR RUSSELL.

The rapid development of bacteriology along agricultural lines necessitates a thorough understanding of the general principle, of this science by those students that desire to keep abreast of the progress of the day. The University has now a fully equipped laboratory for the prosecution of class and research work along these lines.

1. Agricultural Bacteriology. Students will be taught the relation of bacteria to various natural processes that are of utmost importance to the agriculturist, such as the fertilization and restoration of soils by the nitrifying bacteria and by legume tubercles; the germ theory of disease in man, domestic animals, and plants; the general principles of fermentation and decomposition, and their application to practical agriculture. *Laboratory work; full study; first semester.*

2. Dairy Bacteriology. This course is limited to the relation of bacteria to dairy problems, and will include not only laboratory work but the practical application of the pure culture system in butter-making and a thorough study of the normal fermentations which occur in milk, as well as the abnormal fermentations that are such a source of loss in the dairy industry. *Laboratory work; full study; first semester.*

GENERAL INFORMATION.

The facilities for agricultural instruction are already large and steadily increasing. Agricultural Hall is a stone building, one hundred and twenty feet in length by forty-two in width, four stories in height. It contains two large lecture rooms, offices for the several instructors and investigators, library rooms, and several chemical and physical laboratories.

The Hiram Smith Hall, devoted to dairying, was completed in 1891, and affords ample opportunities for the study of the most approved methods used in the manufacture of butter and cheese. The building is fully equipped with the best modern apparatus.

The third building devoted exclusively to agriculture, is Horticultural Hall. This building is three stories in height with large green-houses attached.

At the Experiment Station Farm are the fields for investigation, the 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 Experiment 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 22-27, 95-104.

LIBRARIES.

The Agricultural Library contains over 3,000 bound volumes 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 21.

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.

THE OGILVIE MEDAL.

As a stimulus to the study of some of our improved breeds of live-stock, Mr. R. B. Ogilvie, of Madison, has generously provided a gold medal of exquisite workmanship, valued at $75, to be awarded annually at commencement to the agricultural student who shall show the greatest proficiency in judging draught horses and the mutton breeds of sheep. Medals have been awarded as follows: In 1892, Mr. Arthur G. Hough, Winchester, Wis. In 1893, Mr. J. J. Tschudy, Monroe, Wis. In 1894, Mr. F. E. Baker, Whitehall, Ill.

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, for course, ...	$6 00
Incidental fee, payable by all students, for term, ...	5 00

III. Dairy Course.

Tuition for residents of the State of Wisconsin, ...	FREE
Tuition for non-resident students, including lectureship fee,	$16 00
Incidental fee, payable by all students, for term, ...	5 00
Laboratory fee, ...	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 $60.00 to $75.00 for the term for fees, room, board, washing, and necessary books.

The expenses of the Dairy students will vary from $75.00 to $85.00 for the term.

FARMERS' INSTITUTES.

The third division of work under the direction of the College of Agriculture is the instruction of farmers who are unable to come to the University for study. This is provided for 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 freely used, 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 1894–95, institutes lasting two days each were held at the places named below:

LIST OF INSTITUTES HELD DURING THE SEASON 1894-95.

County.	Place.	County.	Place.
Adams	Friendship.	Marinette	Peshtigo.
Barron	Barron.	Marquette	Briggsville.
Barron	Cumberland.	Marquette	Westfield.
Barron	Prairie Farm.	Monroe	Kendall.
Brown	Denmark.	Oconto	Stiles.
Buffalo	Mondovi.	Outagamie	Appleton.
Buffalo	Waumandee.	Outagamie	Seymour.
Calumet	New Holstein.	Ozaukee	Saukville.
Chippewa	Stanley.	Pepin	Durand.
Clark	Dorchester.	Pierce	Spring Valley.
Clark	Greenwood.	Pierce	Rock Elm.
Columbia	Lodi.	Pierce	River Falls.
Columbia	Pardeeville.	Polk	Clear Lake.
Columbia	Poynette.	Polk	St. Croix Falls.
Crawford	Bell Center.	Portage	Amherst.
Dane	Black Earth.	Portage	Almond.
Dane	Blue Mounds.	Racine	Union Grove.
Dane	Marshall.	Richland	Excelsior.

County.	Place.	County.	Place.
Dodge	Alderly.	Rock	Afton.
Dodge	Beaver Dam.	Rock	Edgerton.
Door	Sturgeon Bay.	Rock	Footville.
Dunn	Colfax.	St. Croix	Glenwood.
Eau Claire	Eau Claire.	St. Croix	Hudson.
Fond du Lac	Calumetville.	St. Croix	Star Prairie.
Fond du Lac	Rosendale.	Sauk	Reedsburg.
Grant	Fennimore.	Sauk	Spring Green.
Green	Albany.	Sheboygan	Elkhart.
Green	Monroe (Closing Institute).	Taylor	Medford
		Trempealeau	Osseo.
Green Lake	Markesan.	Trempealeau	Trempealeau.
Iowa	Arena.	Vernon	Hillsboro.
Iowa	Avoca.	Vernon	Retreat.
Jackson	Hixton.	Walworth	Sharon.
Jackson	North Bend.	Walworth	Lake Geneva.
Jefferson	Hebron.	Washington	West Bend.
Juneau	Mauston.	Waukesha	Big Bend.
Kenosha	Bristol.	Waukesha	Eagle.
Kewaunee	Casco.	Waukesha	Hartland.
LaCrosse	Bangor.	Washburn	Shell Lake.
LaCrosse	Onalaska.	Waupaca	Clintonville.
La Fayette	Blanchardville.	Waupaca	Iola.
La Fayette	Fayette.	Waupaca	New London.
La Fayette	South Wayne.	Waushara	Pine River.
Manitowoc	Mishicott.	Winnebago	Eureka.
Manitowoc	Reedsville.	Winnebago	Winneconne.
Marathon	Spencer.	Wood	Milladore.
Marathon	Wausau.	Wood.	Pittsville.

Location of Institutes.

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 at its June meeting. 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 June 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 publication in the form of bulletins has been begun by the superintendent. Bulletin No. 8, the last issued, contains a stenographic report of the closing institute held at Menomonie in March, 1894. Forty thousand copies of this bulletin have been issued; copies will be sent to all applicants living within the state upon receipt of ten cents to pay postage and mailing.

COLLEGE OF LAW.

CORPS OF INSTRUCTION.

CHARLES K. ADAMS, LL. D., President.

EDWIN E. BRYANT, Dean of the Law Faculty, Professor of Practice and Pleading, Equity, Railway Law, and the Law of Public Offices and Officers.

CHARLES N. GREGORY, A. M., LL. B., Professor of Law and Associate Dean of the Law Faculty, Lecturer on Criminal Law, Law of Personal Property, and Administration of Estates.

JOHN B. CASSODAY, LL. D., Justice of the Supreme Court of Wisconsin, Professor of Constitutional Law.

JAIRUS H. CARPENTER, LL. D., Mortimer Jackson Professor of Contracts.

BURR W. JONES, A. M., LL. B., Professor of the Law of Evidence, Public Corporations, and Domestic Relations.

JOHN MYERS OLIN, A. B., LL. B., Professor of the Law of Real Property, Wills, and Torts.

ROBERT M. BASHFORD, A. M., LL. B., Professor of the Law of Private Corporations, and Commercial Law.

*———— ————, Professor of Legal History, Admiralty, and Roman Law.

JOHN B. PARKINSON, Professor of Constitutional Law and International Law.

RICHARD T. ELY, PH. D., LL. D., Professor of Political Economy.

FREDERICK J. TURNER, PH. D., Professor of American History.

CHARLES H. HASKINS, Professor of Institutional History.

WILLIAM A. SCOTT, PH. D., Associate Professor of Political Economy.

DAVID B. FRANKENBURGER, A. M., Professor of Rhetoric and Oratory.

GEORGE W. SAUNDERSON, A. M., LL. B., Instructor in Elocution.

Special Lecturers.

GEORGE H. NOYES, A. B., LL. B., Special Lecturer on the Law of Common Carriers.

HENRY B. FAVILL, A. B., M. D., Special Lecturer on Medical Jurisprudence.

*This vacancy is to be filled before the opening of the Academic year.

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. The recognition by the members of the bar of their merit and superiority over other methods of gaining professional knowledge finds accurate expression in the report of American Bar Association on legal education and admission to the bar, which was unanimously adopted in 1881 by the Association. The report says :

"There is little, if any, dispute now as to the relative merit of education by means of law schools and that to be got by more practical training or apprenticeship as an attorney's clerk. Without disparagement of more practical advantages, the verdict of the best informed is in favor of the schools.

"The benefits which they offer are easily suggested and are of the most superior kind. They afford the student an acquaintance with general principles, difficult, if not impossible, to be otherwise attained ; they serve to remove difficulties which are inherent in scientific and technical phraseology, and they, as a necessary consequence, furnish the student with the means for clear conception and accurate and precise expression. They familiarize him with leading cases and the application of them in discussion ; they give him the valuable habit of attention, teach him familiar maxims, and offer him the priceless opportunities which result from contact and generous emulation. They lead him readily to survey law as a science, and imbue him with the principles of ethics as its true foundation. Disputing, reasoning, reading, and discussing become his constant exercises."

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. Passing over the obsolete, he learns the actual law of the present time.
2. His studies are directed to give him a comprehensive, general view and analysis of the law as a system.
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, learns where to readily find the decisions and the elaborate treatises on special subjects.

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.

The College of Law of the University of Wisconsin, after many years of experience and experiment, offers a course which is believed to be of unusually practical merit, and to give the utmost of valuable and practical instruction and training that 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 here than in many schools; and more original work carefully directed is required of the students; and examinations are rigid and conducted daily.

The criticism of lawyers upon law-schools has hitherto been that they gave too little attention to remedial law. The committee on legal education of the American Bar Association in their report for 1891, thus state the very general view of the legal profession: "Almost the only defect in law-school education at the present time which has attracted general attention and remark grows out of the fact that they afford no adequate instruction in matters of practice. It is exceedingly desirable that this defect should be remedied in so far as it is possible to do so. To this end practice courts should be established in all schools of law. It is not enough that what are known as moot courts should be organized for the argument of questions of law. . . . There should be practice courts in which the students should have the opportunity of seeing how everything is done from the commencement of the case to the taking out of execution. . . . The student cannot learn practice by simply listening to a teacher expounding principles of practice; but opportunity must be afforded him for doing himself the things which he will have to do in case of actual litigation."

The suggestion of this report had been anticipated by this College. The defects criticised had been here in good part supplied, and the methods recommended had been substantially adopted some years before this report was made, as will more fully appear later on in this statement.

The design of this College is to prepare students for practice in any state and any courts of the Union, and to this end endeavor is

made to give a thorough, practical and scientific education in the 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, Admiralty, and under the Codes of Civil Procedure.

Fourth. THE PUBLIC LAW OF THE UNITED STATES, Constitutional Law, Administrative Law, and International Law.

METHODS AND COURSE OF INSTRUCTION.

The methods of instruction and course of study in this College, are substantially as follows:

Junior Year.

First semester. Elementary Law. Lectures, text-book studies, case study, embracing definitions, history, sources of the Common Law, its development, expansion and modification, presenting an outline of the whole field of jurisprudence and leading to the divisions and topics especially studied.

Under the topic of Written or Statute Law, the subject of Statutes and the canons of interpretation. Case study and exposition. *Two hours a week.*

The Principles of Contracts form the subject of the work of one professor for this semester. The subject is so treated as to make all standard text-books helpful. By the use of these and leading cases, as well as notes taken and original work assigned, students are enabled to master the general and settled doctrines as to contracts, their essentials of parties, subject-matter, assent and consideration, legality of object, performance, release, discharge, etc. Practical exercises are had in preparing and drawing contracts of various kinds.

Domestic Relations, or the laws regulating the relation of husband and wife, parent and child, master and servant, guardian and ward, are studied during this half year. Lectures and examination on text-books and leading cases are given weekly. Under this head the common law as to the status of the wife, the modern equity doctrines and the legislation known as "Married Womens' Acts," relating to her property rights, are carefully considered. *One hour a week.*

Criminal Law, or the Law of Crimes. Lectures, text-book studies and weekly examinations on assigned topics. The general principles of the common law of crimes considered, each of the crimes defined and punishable by the common law studied; and such added elements as are commonly found in modern English and American statutes noticed. *One hour a week.*

The Law of Real Property. The English common law and the part of the English system that constitutes the basis of American land law systematically studied. *One hour a week.*

The Law of Personal Property, embracing chattels, incorporeal personalty and fixtures, the rules applicable to the assignment of incorporeal personal property; the subject of Debts, Debts secured by Lien, or by Pledge and Mortgage of Chattels, Interest and Usury, Copyrights and Patents, Money and Legal Tender. *One hour a week.*

Courts and Jurisdiction. Lectures upon the history and organization of courts in England and America. The elementary law of Jurisdiction, and the Jurisdiction of the Federal Courts. *One hour a week for six weeks.*

The Common-law Actions. Lectures and case study. *One hour a week, twelve weeks.*

Common-law Pleading. Text-book study and examinations based on Chitty, Stephens, and Gould. *One hour a week, four weeks of this semester.* This study includes exercises in drafting.

A prominent feature of the work of the Junior Class during this stage of the course is the exposition of cases. Each student is assigned some leading case or line of decisions, germane to the work of the class at the time and required to write a synopsis of the facts, the decision, and reasoning of the court. From his written statement he orally explains the case or cases to the class. Thus is acquired facility in studying cases, condensing statements, and in expounding the law.

The Class and Faculty Moot Courts meet several times weekly. The Class Moot Court is constituted in several divisions, so that each student is frequently assigned cases. The Faculty Moot Court gives each student opportunity to prepare and argue a case on a submitted statement of facts as often as once each semester. As the class advances in studies in procedure the cases are conducted in conformity to common-law practice and pleading.

Administrative Law and Taxation are specially considered. In the latter topic the constitutional principles, the procedure in assessment, levy, collection, seizure of personal property, sale of lands and subsequent proceedings, and the actions arising out of taxes and tax-titles are especially treated. *One hour a week, twelve weeks.*

Written examinations at the close of topics are had throughout the course.

Second semester. The Law of Contracts, including Bailment and Common Carriers, Agency. *One hour a week.*

Criminal Law, practice and procedure; the rules of criminal pleading, the preparation of indictments, pleas, and all steps in a criminal prosecution exemplified in class work. *One hour a week.*

The Law of Public Offices and Officers. Lectures and examination of cases. Mechem and Throop as text-books. *One hour a week.*

Real Property, continued. The Laws of Uses and Trusts, Powers and Executory Devises considered. *One hour a week.*

Municipal Corporations. Lectures and examinations with Dillon's treatise for text-book. *One hour a week.*

Personal Property, continued. *One hour a week.*

Common-law Practice and Pleading, continued. *One hour a week.*

Elements of Jurisprudence, continued. *One hour a week.*

Equity Jurisprudence, its history and nature. *One hour a week.*

Equity Pleading and Practice. *One hour a week.*

Commercial Law, or the Law of Commercial Paper. *One hour a week.*

The Law of Insurance. Lectures and case study, with Richards as a text-book. *One hour a week.*

Middle Year.

First semester. Real Property, continued. Uses, Trusts, Remainders, Powers, and Executory Devises. *One hour a week.*

Remedial Rights, text-book and case study. *One hour a week.*

Code Pleading, with practical exercises. *One hour a week.*

Equity, continued. *One hour a week.*

Common Law and Code Practice, contrasted. *One hour a week.*

Private Corporations. *One hour a week.*

The Law of Torts, or Non-Contract Law. *One hour a week.*

Probate Law. *One hour a week.*

Eminent Domain. *One hour a week for eight weeks.*

Quasi-Contracts. *One hour a week, eight weeks.*

Suretyship. *One hour a week for six weeks.*

Damages. *One hour a week, eight weeks.*

Conflict of Laws. Case study and theses. *One hour a week.*

Jurisdiction and Procedure in Equity. *One hour a week.*

Patent Law. *Ten lectures.*

Second semester. Real Property. United States Land Law. *One hour a week.*

Equity Jurisprudence. *One hour a week.*

Code Practice. *One hour a week.*

Practice in Federal Courts. *One hour a week.*

Important English Statutes, and their adoption in the United States. *Theses and examinations. One hour a week, eight weeks.*

Institutes of Roman Law. *Lectures.*

Medical Jurisprudence. *Six lectures.*

Administrative Law. *One hour a week.*

Practice in Foreclosure of Mortgages. *Exercises, ten hours.*

Trusts and Proceedings in Equity to Enforce Them. Lectures, case study and exercises. *One hour a week for eight weeks.*

Select Cases in Sales of Personal Property. *One hour a week.*

Senior Year.

First semester. Constitutional Law. Lectures and study of leading cases. *One hour a week.*

Pleading and Practice in Extraordinary Remedies. *One hour a week.*

The Law of Evidence. Lectures and examinations. *One hour a week.*

The Practice of Writs of Error and Appeal ; Creditors' Suits and Supplementary Proceedings.

Select Cases in Real Property.

The Law of Negligence. Special lectures, theses and case study. *One hour a week.*

The Practice in Inferior Courts. *One hour a week.*

Equity, continued. *One hour a week.*

Railway Law. Case study and lectures. *One hour a week.*

Removal of Causes from State to Federal Courts. *One hour a week, six weeks.*

The Law of Wills. *One hour a week.*

Cases assigned for practice in pleading, and conduct of causes, from institution of suit to judgment.

Second semester. Constitutional Law, continued. Lectures and leading cases. *One hour a week.*

The Law of Evidence. Lectures and examinations. *One hour a week.*

Leading cases on the Law of Corporations, involving practice in winding up corporations and remedies against stockholders.

Equity and Procedure in Equity, continued. *One hour a week.*

Legal History. Lectures. *One hour a week.*

Select cases on Charitable Uses. *One hour a week, six weeks.*

Mining Law. Text-book, United States Statutes, and Case Study. *One hour a week, six weeks.*

International Law, Public and Private. *One hour a week, eight weeks.*

Pleading and Practice in Equity.

Forensic Oratory. Text-book, selections, and lectures. *One hour a week.*

The course above indicated has been much commended by jurists for its practical character, and the success which has attended so generally the students who have graduated from this College, the facility with which they enter upon practice, and their advancement in it, have elicited the warm commendation of courts, and attest the practical utility of the methods and courses of study here pursued. It is not claimed, nor can it be expected, that a student can become a thoroughly equipped lawyer in three years in any school or under any system; but he can gain a comprehensive general knowledge of the elementary principles of law, and can learn, along with the substantive law, much of the law of procedure. Best of all, he learns how to study law, where to find it, the best method of legal study, analysis and reasoning. It is the aim of the instructors here to make the student self-reliant and capable of pursuing legal investigation in original work, and tracing the law from its original sources to its present state.

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 wish 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.

QUALIFICATIONS FOR ADMISSION.

The lawyer, unless endowed with great native vigor of mind, cannot take high rank in his profession, unless he has a liberal education. His culture should be broad. He should have a mastery of the English language, familiarity with its literature, and he should be well informed in history and in civil, economic, and social science. A college or university course as a preparatory to pro-

fessional study is very desirable. His professional work often requires that the lawyer become familiar with some specialties of the science of other professions and avocations than his own. His early training should be such as to enable him to readily master them when occasion requires.

Preliminary Course.

It is urged upon all those whose general education is not ample, to take a preliminary course of study in those branches which are most nearly related to law and most serviceable in legal practice, before entering upon the strictly professional course. To facilitate this, adult students. who give evidence of sufficient ability, and are above the age of eighteen years and pass a satisfactory examination in the higher studies taught in accredited high schools will be permitted to take up a select course framed from the following branches: elementary law, history, economics, political science, English literature, rhetoric, elocution and legal Latin, preparatory to entering the three years' law course.

It is the policy of the University to raise the standard of admission to the College of Law as far as consistent with existing educational conditions.

Applicants for admission to the Law Course will be examined in:

1. English language, testing their ability to read and write correctly, and express ideas accurately.
2. American and general history, as a knowledge of law, its growth and changes involves knowledge of the history of the law and of civilization generally.
3. The constitution of the United States and the general features of the constitutions of the States.
4. English literature, to ascertain the extent of his reading and the accuracy and clearness of his memory and understanding of the books he has read.

Unless the student has a good, general English education, as the term is used, he should not enter upon the technical study of law.

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 presenting duly accredited certificates from other law schools of good standing will be admitted to corresponding standing in this College without passing examinations. In such studies or topics as they have not had in the other schools, which

have been passed in the course here when they join, special classes will be formed to enable them to bring up their work and pass examination.

Students entering the Junior class after the beginning of the academic year, will be required to read and pass examination in the work of the class which has been done prior to their admission. It is urged upon all who desire to enter the classes, to begin at the opening of the year, as the disadvantage of entering a class some weeks after it is organized and well advanced in studies is one that hampers the late-coming student through his whole course.

Students who have graduated from the University of Wisconsin, and pass a satisfactory examination in the work of the first year of the law course, or its equivalent, will be permitted to graduate upon taking a two years' course in the College of Law. Students who have studied law elsewhere, and pass a satisfactory examination in the work of the Junior year, may be admitted to the class of the Middle year.

SPECIAL ADVANTAGES.

The peculiar advantages which the City of Madison affords to the law student are equal, and in many respects superior, to any 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 most able lawyers of the state.

Two terms of the United States Circuit and District Courts are held here annually, and important cases are here tried, both in 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 excellent opportunity to learn 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. Nowhere are better facilities conveniently at hand for becoming familiar with the practice in courts and the methods pursued by able and successful practitioners.

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. The site of the University buildings is one of the most beautiful places in the country. Large sums have been and are being expended in buildings, 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 to attain 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. A stately structure, elegant in design and finish, built of the brown sand-stone of Lake Superior, at a cost of over $86,000, it is designed especially 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 ventilating, 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.

Libraries.

The College of Law has an excellent and steadily increasing library of the best of law books and reports. This is expected to be soon greatly enlarged. 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 are 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.

The Library of the State Historical Society, with over 98,000 volumes and 69,000 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 32,000 volumes and 8,000 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.

INSTRUCTION IN ELOCUTION AND ORATORY.

Special instruction in elocution and oratory is given to the law students as follows:

Fall Term.—Elocution and Oratory. (*a*) Voice training for effective quality, reading, declamation and gesture exercises. Lectures on vocal physiology, and on the use and care of the voice. *Twice a week.*

Winter Term.—(*b*) Special drill on reading statutes and other documents before a court or jury. Practice in declamation and extempore speaking. Lectures upon the origin, meaning, and principles of gesture.

EXAMINATION FOR ADMISSION.

The examination for admission will be made on the day preceding the opening day of the academic year. Those intending to apply for admission should notify the 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.

Students applying for admission to the 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.

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 year, 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, making a complete record of each case. He 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.

ADMISSION TO THE SENIOR CLASS.

Candidates who have studied elsewhere, and can pass examination upon the studies of the Junior year and Middle year, or their equivalent, can enter the Senior year. But such examination will be most searching and thorough, embracing all the studies of the Junior and Middle years, except Common Law Pleading and Pleading and Practice in Equity and Criminal Law, in which special classes will enable them to go over those topics. 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.

As the real ground-work of legal proficiency is laid in the earlier year's 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 or the middle year will be the most valuable. The student can, upon the proficiency thus gained, be admitted to the examinations by the State Board of Examination for admission to the bar, and, in his future studies, have the benefit of the elementary training.

TEXT-BOOKS.

Among the text-books used as the ground-work or basis of examination are :

Adams on Equity ; Beach on the Law of Railways ; Benjamin on Sales ; Bishop on Contracts ; Bigelow on Torts ; Bigelow on Bills and Notes ; Bishop on Non-Contract Law ; Bishop on Criminal Law ; Bliss on Pleading ; Bryant on Code Pleading ; Cassoday on Wills ; Cook on Stock, etc. ; Cooley on Torts ; Cooley on Constitutional Limitations; Darlington on Personal Property ; Dillon on Municipal Corporations ; Edwards on Bills of Exchange and Promissory Notes ; Gould on Pleading ; Greenleaf on Evidence ; Langdell on Equity Pleading ; Heard on Civil Pleading ; Heard on Criminal Pleading ; Jones on Evidence ; Keener on Quasi-Contracts; Lawson on Contracts; Lewis on Eminent Domain ; Maxwell on Pleading; Mechem on Agency ; Mills on Eminent Domain ; Morawetz on Private Corporations ; Parsons on Contracts ; Pomeroy's Equity Jurisprudence; Pomeroy's Code Remedies; Redfield on Wills; Rorer on Railroads; Schouler on Domestic Relations; Schouler on Personal Property; Schouler on Wills; Smith on Personal Property; Stephen on Pleading; Story on Agency; Story on Equity Pleading; Story on Partnership; Tiedeman on Commercial Paper; Tiedeman on Real Property; Tiedeman on Sales; Tiedeman on Equity Jurisprudence; Wade on Law of Notice; Washburn's Outlines of Criminal Law; Washburn on Real Property; Willard's Equity Jurisprudence; Williams on Real Property.

The books mentioned in the following list may be used to advantage:

Bailments.—Edwards, Schouler, Story.

Bill, Notes, and Commercial Paper.—Byles, Chalmers, Daniel, Parsons, Randolph, Story, Bigelow and Norton.

Common Carriers.—Hutchinson, Redfield on Railways; Thompson on Passenger Carriers; Noyes' Lectures.

Constitutional History.—Hallam's Constitutional History of England (1485–1760); May's Constitutional History of England (1760–1870); Young's Constitutional History of England (1760–1860);

Bagehot's English Constitution; Fischel's English Constitution; Cox's English Institutions; Curtis' History of the Constitution of the United States; Bancroft's History of the Constitution of the United States; Von Holst's Constitutional History of the United States.

WILLS AND ADMINISTRATION.—Redfield on Wills; Jarman on Wills; Williams on Executors; Woerner's American Law of Administration.

CONSTITUTIONAL AND STATUTE LAW.—Cooley's Principles of Constitutional Law; Endlich on Interpretation; Story's Commentaries on the Constitution of the United States; Sedgwick on Constitutional and Statutory Law; Jameson's Constitutional Counselor; Bishop's Written Law; Maxwell on the Interpretation of Statutes.

CONTRACTS.—Anson, Benjamin, Bishop, Metcalf, Parsons, Pollock.

CORPORATIONS.—Angell and Ames, Field, Morawetz, Taylor, Dillon on Municipal Corporations; Thompson on Liability of Stockholders; Cook on Stock and Stockholders; Beach on Corporations.

CRIMINAL LAW.—Bishop, Clark, Wharton, Harris, May, Stephen's Digest of Criminal Law.

DOMESTIC RELATIONS.—Reeves, Bailey's Master's Liability for Injuries to Servant; Bishop on Marriage and Divorce; Bishop on Married Women; Cord on Married Women; MacDonnell on Master and Servant; Ewell on Infancy; Tyler on Infancy; Schouler's Domestic Relations.

EASEMENTS.—Goddard, Washburn.

EQUITY.—Pomeroy or Story's Equity Jurisprudence; Adams' Equity; Bispham's Principles of Equity; Beach on Equity Jurisprudence; Fetter's Equity Jurisprudence.

ESTOPPEL.—Bigelow, Hermann.

EVIDENCE.—Best's Principles of Evidence; Bradner on Evidence; Stephen's Digest of the Law of Evidence; Wharton, Starkie, Rogers on Expert Testimony; Underhill on Evidence.

INSURANCE.—May on Insurance; Wood on Fire Insurance; Beach on Insurance; Bliss on Life Insurance; Arnould on Marine Insurance; Richards on Insurance.

INTERNATIONAL LAW.—Wheaton's Elements of International Law; Phillimore's International Law; Woolsey's Introduction to International Law; Hall's International Law; Story's Conflict of Laws; Wharton's Conflict of Laws.

JURISPRUDENCE.—Holland's Elements of Jurisprudence; Austin's Lectures on Jurisprudence; Lorimer's Principles of Jurisprudence; Ames on the Science of Law; Curtis' Jurisdiction of United States Courts.

MINERAL LAWS.—Weeks.

PARTNERSHIP.—Lindley, Parsons, Story, Tyler, Pollock.

PLEADING.—Gould, Chitty, Bliss on Code Pleading; Story's Equity Pleading; Barton's Suit in Equity; Maxwell on Code Pleading; Bryant on Code Pleading; Kinkead's Code Pleading.

RAILWAYS.—Beach, Rorer, Redfield, Hutchinson on Carriers.

REAL PROPERTY.—Boone, Williams, Tiedeman.

REPLEVIN.—Cobbey.

SALES.—Benjamin, Tiedeman, Smith.

SHIPPING AND ADMIRALTY.—Abbot, Conklin, Desty, Parsons, Benedict.

TAXATION.—Blackwell, Burroughs, Cooley, Desty.

TORTS.—Addison, Ames, Hilliard, Moak, Weeks, and Bishop on Non-Contract Law.

Students, who are able to do so, will find it to their advantage to furnish their own books. 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 year, for about seventy-five dollars. The law library has several copies 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 E. G. Ryan Literary Society, the Forum and the Columbian are three incorporated literary societies, composed entirely of law students. Each of them is in flourishing condition; and each 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.

EXPENSES, ETC.

The matriculation fee for the full course is $205, of which $85 must be paid at the opening of the first year, $60 at the opening of the second year, and $60 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.

Students entering the Middle year, for a two years' course, will be required to pay $85 for the Middle year and $60 for the Senior year.

Students admitted to the Senior class, whether upon examination or upon standing certified from other law schools, are required to pay a matriculation fee of $110.

All fees are payable in advance at the office of the Secretary of the Board of Regents, College of Law.

The expenses of living are moderate. Good board can be obtained at from $3 to $4 per week, and by forming or joining clubs the expenses can 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 inquiry as to admission, examination, etc., be necessary, it should be addressed to the Associate Dean of the Law Faculty, Madison, Wisconsin.

SCHOOL OF PHARMACY.

CORPS OF INSTRUCTION.

CHARLES K. ADAMS, LL. D., President of the University.
EDWARD KREMERS, PH. G., PH. D., Professor of Pharmaceutical Chemistry.
CHARLES R. BARNES, PH. D., Professor of Botany.
EDWARD A. BIRGE, PH. D., Professor of Zoology.
JULIUS M. CLEMENTS, PH. D., Assistant Professor of Geology.
WILLIAM W. DANIELLS, M. S., Professor of Chemistry.
JAMES C. ELSOM, M. D., Professor of Physical Culture and Director of the Gymnasium.
DAVID B. FRANKENBURGER, A. M., Professor of Rhetoric and Oratory.
HOMER W. HILLYER, PH. D., Assistant Professor of Organic Chemistry.
WILLIAM H. HOBBS, PH. D., Assistant Professor of Mineralogy and Petrology.
EDWARD T. OWEN, A. B., Professor of French Language and Literature.
WILLIAM H. ROSENSTENGEL, A. M., Professor of German Language and Literature.
HARRY L. RUSSELL, PH. D., Assistant Professor of Bacteriology.
CHARLES S. SLICHTER, M. S., Professor of Applied Mathematics.
BENJAMIN W. SNOW, PH. D., Professor of Physics.
CHARLES R. VAN HISE, PH. D., Professor of Geology.
CHARLES A. VAN VELZER, PH. D., Professor of Mathematics.
LOUIS W. AUSTIN, PH. D., Instructor in Physics.
LELLEN S. CHENEY, B. S., Instructor in General and Pharmaceutical Botany.
RICHARD FISCHER, PH. C., B. S., Instructor in Practical Pharmacy.
JOHN S. MEAD, M. S., PH. G., Assistant in Pharmaceutical Technique.
CARL G. HUNKEL, PH. G., Fellow in Pharmaceutical Chemistry.
WILLIAM O. RICHTMANN, PH. G., Assistant in Pharmaceutical Chemistry.
ARTHUR P. SAUNDERS, PH. D., Instructor in Chemistry.
HERMAN SCHLUNDT, B. S., Assistant in Chemistry.
CHARLES B. THWING, PH. D., Instructor in Physics.
ALFRED VIVIAN, PH. G., Assistant in Pharmacognosy.

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 technical 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. This 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 pharmaceutial education.

For the more applied and technical course special laboratories have been equipped. The instructional force in these departments of study have had practical experience in pharmacy, and are in thorough sympathy with the needs and requirements of the professional pharmacist.

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 mauufacturing establishments, as analytical or sanitary chemists or as bacteriologists, will find that the graduate courses both of the School of Pharmacy and also 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. 34-45 of the general University catalogue.

Information about studies in the Four Years' Course and in the College of Science and Letters can be found elsewhere in the University catalogue, which can be obtained from the Registrar of the University.

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, or, whenever necessary, in the field.

LABORATORIES.

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

First. The Qualitative Laboratory, with accommodations for ninety-six students.

Second. The Organic Laboratory, accommodating thirty-two students; and,

Third. The Quantitative Laboratory, accommodating forty-eight students.

Of the three special laboratories, one is for Gas-analysis, one for Urine-analysis and one for Toxicology.

Pharmaceutical Chemical Laboratory. This is located on the third floor of North Hall. It affords ample accommodation to the second year students. Every student is asigned a desk, which he alone uses. The balance room is well equipped with Becker's and Sartorius' balances, a torsion balance, etc. A Bunsen combustion furnace, a Glazer combustion furnace with the latest improvements 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. Models for the better study of the balance and other pieces of apparatus have been ordered, so that next year the equipment for the study of the balance and of the subjects of weights and measures and specific gravity will be much more satisfactory. Of other instruments there may be mentioned a polariscope from Schmidt & Haentsch, a total refractometer for chemists after Pulfrich, a Geissler vaporimeter for the determination of alcohol, etc.

Biological Laboratories. These are on the third floor of Science Hall. The elementary laboratory for the departments of botany and zoology is arranged to accommodate 72 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 80 compound microscopes, chiefly by Leitz and Bausch & Lomb, fitted for elementary and advanced work, including seven microscopes furnished with oil immersion objectives.

The laboratories for advanced work in botany are fitted up with the apparatus and reagents necessary to an advanced course in vegetable histology, and to a course in vegetable physiology.

There are also laboratories for advanced work in zoology and histology, and a well-equipped bacteriological laboratory. The latter is in Agricultural Hall.

Pharmacognostical Laboratory. This laboratory is situated on the fourth floor of North Hall. Besides a place at the working table each student is furnished a series of drawers for the arrange-

ment and storage of his collection of vegetable drugs. In the same room is kept for reference the standard working collection of drugs of the department.

Laboratory for Practical Pharmacy and Dispensary. On the first floor of North Hall and in the basement several rooms have been equipped during the present year. The laboratory is not arranged for class instruction but for *individual* instruction, the number of students working at a given time being limited.

Mineralogical Laboratory. The Mineralogical Laboratory has reagents and other necessary apparatus for complete courses in blow-pipe analysis and determinative mineralogy. There is a collection of hand specimens of minerals for laboratory use, and for comparative purposes. The students also have access to the large collections in the cabinet.

The Assay Laboratory, situated in the south part of the basement of the chemical building, is one of the largest and best equipped laboratories of its kind in the country.

A more detailed description of these laboratories as well as of the petrological, psychological, and the various agricultural laboratories, will be found in the general catalogue of the University, College of Science and Letters, and College of Agriculture.

THE PHARMACEUTICAL MUSEUM.

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 odd specimens of their products in various stages of manufacture were added last year. 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 has been very largely increased by purchases made at the World's Fair, the recent 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 100 Malay medicines. Worthy of mention are also a collection of 122 handsome specimens of essential oils and allied synthetic products, the liberal donation of Messrs. Schimmel & Co., of Leipzig, Germany; a collection of choice drugs from Messrs. Lehn & Fink, a materia medica cabinet from Parke, Davis & Co., a collection of officinal drugs from Schieffelin & Co., etc.

A collection of objects of historical interest has been begun, and valuable contributions have 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.

The General University Library, including the department libraries catalogued therewith, contains about 32,000 books and 9,000 pamphlets. About 200 of the best American and foreign periodicals are taken.

The several scientific departments have special library facilities. The chemical and pharmaceutical laboratories have their department libraries easily accessible to the laboratory student. Complete sets of several of the best chemical and pharmaceutical journals and of proceedings of associations have been purchased in recent years. A complete set of the *Archiv für Pharmacie* has has just been received. Contemporary pharmaceutical literature is well represented in the reading room.

Students also have access to the State Historical Library, numbering about 165,000 volumes, including pamphlets, and by special arrangements books may be obtained from the free library of the City of Madison, which is a well-selected collection of of over 13,000 volumes.

TERMS OF ADMISSION.

To the Two Years' and Three Years' Courses.

Graduates from accredited 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 57 of the general catalogue. 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.

FEES AND EXPENSES.

No tuition is required from students who are residents of the State of Wisconsin ; non-residents pay $15 each semester.

The fee for incidental expenses is $20 per semester.

These fees must be paid before class cards can be issued.

The following laboratory deposits are required :

Junior Year.

In the Chemical laboratories (full study, one year), . . . $20 00
In the Botanical Laboratory (full study, one year), . . . 8 00
In the Pharmaceutical Laboratory: Pharmaceutical Technique (two-fifths study, one year), ... 10 00

Senior Year.

Chemical Laboratory: Quantitative Chemical Analysis (full study, one semester), ... $10 00
Botanical Laboratory: General Anatomy and Anatomy of Drugs (full study, one year), ... 8 00
Pharm. Chem. Laboratory: Applied Chemical Analysis and Thesis (one and a half study, one year), ... 35 00
Pharmaceutical Laboratory: Practical Pharmacy (full study, one year), ... 15 00
Pharmacognostical Laboratory: Pharmacognosy (two-fifths study, one year), incl. collection of drugs, ... 10 00

In the chemical and pharmaceutical chemical laboratories accurate accounts of material used and apparatus broken by the student are kept, and such sums as may remain to the eredit of the student at the completion of his course will be refunded.

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 $2.50 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*; Biology, 20; Pharmaceutical Technique, throughout the year. Sufficient additional work, physics if possible, must be elected to make at least three full studies.

Senior Year.

Pharmaceutical Chemistry, 1, 2, and 4; Quantitative Chemical Analysis; Biology, 16; Pharmacognosy; 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.

Synoptical lectures in Mineralogy, Paleontology, and Geology must be taken at some time during the course.

FOUR YEARS' COURSE.

Freshman Year.

Biology, 1; German, 9; Mathematics, 1, 2, 3; Rhetoric, 2; Gymnastics, Military Drill.

Sophomore Year.

French, 3; Chemistry, 1, 2, 3; Physics, 1, 2; Rhetoric, 3; Gymnastics, Military Drill.

Junior Year.

Pharmaceutical Chemistry, 1; Pharmaceutical Botany; Pharmaceutical Technique; elective, three-fifths or more.

Senior Year.

Pharmaceutical Chemistry; Pharmacognosy; Practical Pharmacy; Thesis.

If pharmaceutical chemistry is elected as major, pharmaceutical botany must be taken as first minor, or *vice versa*.

With regard to Synoptical Lectures and rules of the Group system, compare pages 67–69 of the general catalogue.

For further information address Professor Edward Kremers, Madison, Wis.

DEPARTMENTS OF INSTRUCTION.

CHEMISTRY.

PROFESSOR DANIELLS, ASSISTANT PROFESSOR HILLYER, DR. SAUNDERS, AND MR. SCHLUNDT.

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 and Mr. SCHLUNDT. *Second semester.* Qualitative Analysis until the Easter recess; then Descriptive Organic Chemistry, lectures and laboratory work. Assistant Professor HILLYER and Mr. SCHLUNDT.

2. Advanced Inorganic Chemistry, second year. Preparation of chemically pure salts; determination of the equivalence of elements and the density of gases; the principles of gravimetric and volumetric analysis and their applications in the analysis of ores, crude metals, slags, technical products, and gases, together with one exercise each week in theoretical chemistry, the solving of chemical problems and the history of chemistry. *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 Dr. SAUNDERS.

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 Dr. SAUNDERS. For graduates and undergraduates.

4. 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.

Organic analysis, determination of physical constants, special and research work with preparation of thesis. *Full study; second semester.* Assistant Professor HILLYER. For graduates and undergraduates.

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

Students wishing to become practical chemists, physicians, teachers, etc., will so far as is possible be given work that will be of greatest service in accomplishing the end they have in view.

5. Synoptical Lectures. A course of synoptical lectures will be given weekly during part of the year 1895–96.

Twelve hours' laboratory work a week is regarded as the equivalent of a full study.

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.

Instructors and advanced students will 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.

PHARMACEUTICAL CHEMISTRY.

PROFESSOR KREMERS, MR. RICHTMANN, AND MR. HUNKEL.

1. Pharmaceutical and Pharmacognostical Chemistry. This course will consist 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, Bernthsen's Organic Chemistry, U. S. Pharmacopœia, 1890. *M., Tu., Th., F.* Professor KREMERS.

2. Chemical and Pharmaceutical Operations. A continuation of Course 1 in pharmaceutical technique. The topic system will be employed. *W., first semester.* Professor KREMERS.

3. During the second semester one lecture or recitation per week will be devoted to the study of some historical subject, the subject to be announced at the opening of the semester. *W.* Professor KREMERS.

4. Applied Chemical Analysis. Chemical analysis, qualitative and quantitave, gravimetric and volumetric, in its application to pharmacy. This will be chiefly a laboratory study with weekly recitations and lectures. It will not, however, be merely a study of methods, but also of chemical principles involved. *Three hours daily during the first semester.* Professor KREMERS, Mr. RICHTMANN, and Mr. HUNKEL.

5. Advanced Work for Preparation of Thesis. Students who have pursued the chemical studies prescribed in the short course for a year and a half may prepare a thesis in this department, subject to be chosen on consultation with the instructor. Professor KREMERS.

6. Course in Non-nutritive Plant Constituents. Students in botany who have had at least a year's work in general chemistry can, upon special arrangement, take this course. *Full study for at least one semester.* Professor KREMERS.

7. Advanced graduate work adapted to the individual.

BIOLOGY, INCLUDING PHARMACEUTICAL BOTANY.*

PROFESSOR BIRGE, PROFESSOR BARNES, ASSISTANT PROFESSOR RUSSELL, DR. MILLER, DR. MARSHALL, MR. CHENEY, AND MR. HEALD.

1. General Biology. Introductory to both botany and zoology, and required as preliminary to all advanced work in either department. Two recitations or lectures a week, and ten hours' weekly of laboratory work, using as a hand-book Dodge's Biology.

   The recitations are given in the afternoon, at 3 in the *first semester*, 2 in the *second semester*. The class meets in two divisions, *M., W.; Tu., Th.* Professor BARNES 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. HEALD. Required of Freshmen in General Science Course.

   In the first semester the general principles of biology are studied for the first month, the remainder of the semester is devoted to botany. The second semester is given to zoology. Students can enter the course in either semester.

*Only those courses are enumerated here which are of special interest to the pharmaceutical student. Further information concerning studies offered in the biological departments see p. 101 University catalogue.

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.

15. General Morphology of Plants. The course is recommended only as a sequel to 1. Its aim is, by a study of the structure of various types of plants, to fill out and complete the student's idea of the forms of vegetable life. To this end such plants will be used as supplement those in Course 1. First semester, Thallophyta and Bryophyta; second semester, Pteridophyta and Spermaphyta. In the second semester attention will also be given to collecting and naming such groups of plants as each student may select for his special study. Ten hours a week throughout the year. *Daily; hours on consultation.* Professor BARNES.

20. 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, algæ, lichens; mosses, and ferns, illustrated by selected types. Second semester, the form and structure of seed plants. The course will be supplemented by botanical excursions, six in the autumn and ten in the spring, *Daily*, 9-11. Excursions on Saturdays. Mr. CHENEY.

21. Herbarium Work. Pharmacy students are required to prepare during the summer, and to present at the opening of their Senior year, a collection of 50 species of seed-plants from the vicinity of their homes, named and mounted; 25 of these are also to be fully described.

A duplicate of this collection, in which the plants are named, but not mounted nor described, must also be presented; this will be retained by the University. Mr. CHENEY.

22. Anatomy of Drugs. Vegetable histology applied to the examination of commercial drugs. Course 11 must precede this. *Second semester; daily*, 11-1. Mr. CHENEY.

23. Bacteriology. General course, including the study of typical forms with the microscope and in cultures. The course will cover the general field, although special attention will be given to disease-producing germs, in the latter part of the course. Applicants must be thoroughly familiar with the compound microscope. Text-book, Abbott's. Prin-

ciples of Bacteriology. Lectures and laboratory. *First semester; full study.* Assistant Professor RUSSELL.

24. Advanced Work in Bacteriology. A limited number of students prepared to do advanced work can be accommodated in the laboratory. Arrangements for work of this sort may be made upon consultation with instructor. No credit will be given on work less than full study for full semester. Assistant Professor RUSSELL.

PHYSICS.

GENERAL PHYSICS: PROFESSOR SNOW, DR. AUSTIN, AND DR. THWING.
MATHEMATICAL PHYSICS: PROFESSOR DAVIES.

1. General Lectures. Mechanics and Heat, Electricity and Magnetism, Acoustics and Optics. Required of students in the Four Years' Pharmacy Course. Two lectures a week. *Throughout the year.* Two sections; *M., W., at* 12; *Tu., Th., at* 12. Professor SNOW. One recitation on Friday or Saturday by the class in smaller sections, at hours to be assigned. Professor SNOW and Dr. THWING.

   This course is intended for those taking up the study for the first time, or for those who have studied it only in an elementary manner.

2. Introductory Laboratory Practice. An introduction to the theory and methods of physical measurements.

   This course is intended to accompany Course 1, and is required of all students who take Course 1, with the exception of those in the Ancient and Modern Classical courses. A knowledge of plane trigonometry, including the use of logarithms, is required for registration in this course. *Throughout the year; twice a week; hours to be assigned.* Dr. AUSTIN and DR. THWING.

PHARMACEUTICAL TECHNIQUE.

PROFESSOR KREMERS AND MR. MEAD.

A Study in Applied Mechanics and Physics. Laboratory practice in the use of the balance, the determination of specific gravity according to various methods, and other subjects of a mechanical nature. From the chapter on heat another series of subjects will be selected, including determination of melting point and boiling point, methods of crystallization, etc. The laboratory exercises will be supplemented

by lectures and recitations. *A two-fifths study throughout the Junior year.* Students with good standing may elect more work upon consultation with the instructor and class officer.

MINERALOGY, PETROLOGY AND GEOLOGY.

PROFESSOR VAN HISE, ASSISTANT PROFESSORS HOBBS AND CLEMENTS.

3. Blowpipe Analysis and Determinative Mineralogy. This course consists almost entirely of laboratory work. It can be adapted to the needs of pharmacy students, and may be made either a three fifths or a full study. *Winter term*, 8-10.

7. Synoptical Lectures. The courses running through the year include mineralogy and petrology by Prof. Hobbs, systematic paleontology by Prof. Clements, and physical geology by Prof. Van Hise. Given in 1893-94, and alternate years threafter. *M., at* 4.

PRACTICAL PHARMACY.

MR. FISCHER.

1. Theory and Practice of Pharmacy. Class work, 2 hours a week during both semesters.

History of pharmacopœias and discussion of U. S. Pharmacopœia. 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. Operative pharmacy. Laboratory work. A three-fifths course throughout the year.

2. 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 such cases in which difficulties are liable to occur.

3. Special work adapted to the individual. This course open only to graduates and others having an equivalent preparation.

PHARMACOGNOSY.

MR. VIVIAN.

Students are required to arrange systematically a collection of drugs (for which the material is largely furnished), to label neatly each specimen, and, as far as possible, make sections and drawings with descriptions of the same. This work is supplemented by topics on the general natural history of the plant from which the drug is obtained; habitat, cultivation, collection, commerce, botanical description, chemical composition, history, uses, etc. While studying a topic the student is compelled to familiarize himself with works bearing on the subject, which otherwise would very largely escape his notice

This work is supplemented by lectures by members of the Faculty.

THESIS.

A thesis is considered an important part of the course, in as much as it supplements the general work. In the course of his earlier studies the student has surveyed large fields of learning, while at work on his thesis he concentrates his time and attention largely on one subject.

The student may select the subject of his thesis in any department in which he has received instruction, provided he be found proficient by the instructor under whose personal supervision he chooses to carry out such work. About a semester and a half, four hours daily, are expected to be given to the necessary laboratory experiments. However, time is not the only criterion. The thesis, when written, must be satisfactory to both instructor and class officer. It must be delivered to the class officer on or before the second Friday preceding graduation, accompanied by a written recommendation from the instructor.

All correspondence or inquiries relating to the School of Pharmacy should be addressed to Professor Edward Kremers, Madison, Wis.

SCHOOL OF MUSIC.

CORPS OF INSTRUCTION.

CHARLES K. ADAMS, LL. D., President.
FLETCHER A. PARKER, Director, Musical History, Harmony, Counterpoint, and Organ.
JAMES S. SMITH, Piano.
ADA BIRD, Piano.
WILLIAM G. SIRED, Piano and Voice.
——— ———, (To be supplied.) Voice.
CHARLES NITSCHKE, Violin, 'Cello, Flute, Mandolin, and other orchestral instruments.
JOHN LUEDERS, Violin, 'Cello, Mandolin, Zither, and other orchestral instruments.
ANNIE M. LYON, Mandolin, Guitar, and Banjo.
NETTIE M. GALE, Secretary, French and German Pronunciation.

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. For the ensuing year instruction is offered in organ, piano, singing, orchestral instruments, mandolin, guitar, and banjo, and in musical theory, choral practice, harmony and counterpoint. In the study of piano or of singing (voice culture) instruction will be 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 will be employed. In the theoretical studies students are recommended to join the University classes, but private lessons may be arranged for if preferred.

Especial attention is called to the following extracts from the resolution of the Board of Regents establishing the School of Music:

I. The University shall assume no responsibility for individual or class instruction in instrumental music or vocal training.

II. Students shall arrange for individual or class lessons in instrumental music or vocal training, with the Director of the School of Music or some officer designated by him; and for such lessons special fees shall be paid.

III. The University Professor of Music shall furnish instruction as at present to classes in Musical Theory and Choral Practice, in Harmony and in Counterpoint, together with such additions in the way of Musical History and kindred subjects as shall best meet the wants of University students.

It will be seen that the former status of the classes, in Musical Theory and Choral Practice, in Elementary and advanced Harmony, and in Counterpoint, is not changed. University students not connected with the School of Music may, as at present, take, without charge, any of these classes as electives, and receive proper credit therefor. Students of the School of Music may enter these classes as hereafter specified.

COURSES.

There will be two general courses, as follows:

I. The Collegiate Course,

in which the requirements for admission shall be the same as for some one of 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 outlined courses of study. A graduate's diploma will be granted on the completion of this course. Three years of study are required. 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*, first half.

Mason's, Zwintscher's, or Plaidy's Technics throughout the course.

First Year: Heller, *Op. 47*, last half. 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 will be expected to take more than a portion of the studies mentioned, and equivalents will be liberally used to suit individual cases. On the other hand, these studies will be 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 will be continuous, beginning with Stainer's *Organ School* or Whiting's *First Six Months on the Pedal 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 will be used.

Careful training will be 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 Sostenuto 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, simple intervals, distinctions 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 suspension, appoggiatura, etc. Harmonizing melodies. Counterpoint, simple and double.

II. ACADEMIC COURSE.

There are no requirements for entrance. Students will be received and graded according to ability and amount of previous study. This course will in all departments lead up to and overlap 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 work 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 will be given to expression, technique, and proper fingering. In general correct methods leading to the highest proficiency will be 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 Guiseppe Branzoli, supplemented by solo selections.

Orchestra.

The University Orchestra, successfully organized during the past year, will meet 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 a credit of one-fifth.

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. The active chorus now numbers over 160 members. Very successful performances of Handel's *Messiah*, and Haydn's *Creation* have been given, and other works of similar magnitude will follow. The third concert will be given May 3, 1895, with the co-operation of Theodore Thomas' Chicago Orchestra.

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 fifty cents.

Recitals and Concerts.

There will be three student recitals and one Faculty concert each semester of the coming year, free to all students. The Faculty reserves the right to add to the number of these if thought advisable, or to add recitals by special artists from abroad, at a low price to the 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.

	Half-hour lessons.	Three-quarter hour lessons.	Hour lessons.	In class of three, 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., with Mr. Nitsche,	18.00	27.00	36.00	.....
Violin, etc., with Mr. Lueders,	.....	18.00	.....	.....
Guitar, etc., with Miss Lyon,	18.00	27.00	36.00	.....

One lesson a week.

	Half-hour lessons.	Three-quarter hour lessons.	Hour lessons.
Piano,	$15.00	$22.00	$27.00
Voice,	15.00	22.00	27.00
Organ,	.....	.....	27.00
Violin, etc., with Mr. Nitsche,	.....	15.00	20.00
Violin, etc., with Mr. Lueders,	.....	9.00	.....
Guitar, etc., with Miss Lyon,	.....	15.00	20.00
Diploma fee,	.....	.....	5.00

Theoretical studies will be taken in the University classes, and those who are not otherwise connected with the University will be expected to pay the incidental fee of the College of Letters, which is $10.00 a semester.

Students will not be received for less than one semester except by special permission of the Faculty of the School of Music. Students will be allowed, however, to pay the tuition fees by the half-semester in advance.

No student will be 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 will be allowed 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 from 9 to 10.

For announcement giving information in fuller details, address

F. A. PARKER, Director, 14 W. Gilman St.,

or MISS NETTIE M. GALE, Secretary, 16 E. Mifflin St.,

Madison, Wis.

WISCONSIN SUMMER SCHOOL.

CORPS OF INSTRUCTION.

JOHN W. STEARNS, LL. D., *Professor of Philosophy and Pedagogy*, Director of School.—Psychology and Pedagogy.

CHARLES R. BARNES, PH. D., *Professor of Botany.*—Botany.

LOUIS W. AUSTIN, PH. D., *Instructor in Physics.*—Physics.

EDWARD A. BIRGE, PH. D., *Professor of Zoology.* Physiology and Zoology.

EDWARD P. CARLTON, B. S., *Graduate Student.*—Histology.

GARRY E. CULVER, M. A., *Stevens Point Normal School.*—Geology.

W. W. DANIELLS, M. S., *Professor of Chemistry.*—Chemistry.

JOHN C. FREEMAN, PH. D., *Professor of English Literature.*—English Literature.

FRED D. HEALD, B. S., *Fellow in Botany.*—Biology.

W. H. ROSENSTENGEL, A. M., *Professor of German Language and Literature.*—German.

WILLIAM A. SCOTT, PH. D., *Associate Professor of Political Economy.*—Political Economy.

KATHERINE L. SHARP, PH. M., B. L. S., *Armour Institute.*—Library Science.

CHARLES S. SLICHTER, M. S., *Professor of Applied Mathematics.*—Mathematics.

LEONARD S. SMITH, B. C. E., *Instructor in Engineering.*—Surveying.

HIRAM A. SOBER, A. B., *Instructor in Latin.*—Latin.

CHARLES B. THWING, PH. D., *Instructor in Physics*—Physics.

FREDERICK J. TURNER, PH. D., *Professor of American History.*—History.

The eighth annual session of the Summer School will be held at the University for six weeks, from July 8 to August 16, 1894.

FOR WHOM DESIGNED.

While established originally for the assistance of *teachers* and those preparing to teach in grammar and high school grades, the Summer School is by no means exclusively for such. It is open to *any one* wishing to pursue any of the branches of study specified in this circular. Those who are anxious to study at home and wish help and guidance as to matter and methods will find them here. *High School graduates* expecting to enter the University will find

this School of use to them in supplementing the instruction they have received and making them better prepared for thorough work in their classes. *University students* desiring to extend their course in any of these lines, or to make up deficiencies in them, will find the School a valuable help. *Those wishing to do special* work during the summer looking to a thesis for graduation can usually make arrangements for such work with the instructors in this School. *Students expecting to teach* after graduation will find the courses especially valuable to them. *Persons intending to take the state examinations*, which commence the Tuesday after the school closes, will find here the help and guidance they need in finishing their preparation.

Teachers and principals of high and grammar schools will note the purpose indicated in the several branches to give assistance in the teaching of these branches. What to teach and how to teach it so as to meet the requirements of the University, and so as to secure the best results for average students, will be carefully considered in connection with each of the subjects.

CREDIT AT THE UNIVERSITY.

By consultation with the instructors, arrangements may be made in many of the branches, by which credit will be given in the University for work done in the Summer School. Students desiring such credit must have passed the entrance examinations for one of the University courses, and must expect to pass a satisfactory examination upon the work done in the Summer School. The amount of credit will in all cases be determined by the amount of work done. The increase in the length of the session from four to six weeks, makes it possible to accomplish much more during the summer, especially by concentration of effort upon a single branch of study. By this change also the school is brought into closer organic relations with the University. In this connection special attention is directed to the statements on p. 62 of the catalogue of the University.

LABORATORIES.

The laboratories in botany, chemistry, physics, and zoology will be in charge of the professor or a competent assistant. The School has aimed to assist its students to acquire laboratory methods and to reach knowledge through laboratory work. The task is not an easy one as the short time at the disposal of the School renders it necessary to reach results at once, but the Faculty feel that they have succeeded quite up to their own expectations, and to those of the students. Those who wish to profit most

from the school are advised to take not more than two courses in science and one elsewhere. Experience has shown that those students who attempt to cover more ground usually find that their work has been of only moderate value to them, while the best results have been reached by those who have spent several seasons at the school, devoting each session to one or two studies only.

LIBRARIES.

The University Library, containing about 33,000 books and 9,000 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 100,000 volumes and 69,000 pamphlets, undoubtedly one of the most complete and valuable collections of historical material to be found in the Northwest. The Madison city library, of over 13,000 volumes, will also be accessible for all the purposes of the school.

LIBRARY SCIENCE.

Through the generosity of the Hon. James H. Stout, of Menomonie, means have been provided for establishing courses in library science, and Miss K. L. Sharp, Director of the Department of Library Science, in the Armour Institute, Chicago, has been engaged to give the instruction. These courses will last four weeks from July 8, and will be open to all members of the School. The Department of Public Instruction will furnish a model library and teachers will be instructed in the use of books adapted to the school work of various grades. It is hoped that this instruction will result in developing the intelligent use of the school library and in awakening increased interest in the subject.

EXPENSES.

The uniform rate of tuition is $15.00, which entitles the student to all privileges of the school, except that in the laboratories payment must be made for material consumed and for breakages.

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

The Ladies' Hall of the State University will be opened during the session of the school. Ladies who wish to secure rooms and board there should make early application to Mrs. J. C. Lander, Madison, Wis.

DEPARTMENTS OF INSTRUCTION.

PSYCHOLOGY AND PEDAGOGY,

PROFESSOR STEARNS.

1. The general course of Psychology will have especially in view the theory of teaching, and will therefore be directed to those topics which bear most closely upon pedagogy. By selecting the topics in this way it is hoped that more time can be given to each one, and the practical bearings of the study can be made more prominent. The special field of work will therefore be cognition, to the general view of which will be added a more detailed study of the reasoning powers. An important feature of the course will be special topics and references for investigation and report by such members of the class as choose to undertake this work. Murray's Handbook of Psychology is specially recommended to those intending to take this course, and it will be found the most convenient manual as a guide to the class work.

2. A second course in Psychology, more advanced in character and requiring at least four hours' work per day of those taking it, will be offered if there are a sufficient number of applicants for it.

3. In Pedagogy two courses will be offered. The first will be based upon the Report of the Committee of Ten, and will relate to methods in grammar and high school work, and to the administration of courses of study. This course will continue four weeks.

4. The second course of two weeks will be devoted to outlines of the Herbartian Pedagogy. The special interest developed in this country during the past two years in this subject gives it much significance at the present time, and it is believed that many teachers will be glad to avail themselves of this opportunity to become familiar with its leading doctrines.

HISTORY.

PROFESSOR TURNER.

1. The Study of History: Lectures on the significance of history and the methods of studying and teaching the subject, as illustrated by selected topics in general history. Students intending to take the course would profit by a prior reading of the recommendations of the historical conference, embraced in the Report of the Committee on Secondary School Studies appointed at the meeting of the National Educational Association, 1892, and issued by the U. S. Bureau of Education, Washington, D. C.

2. American Growth from 1789 to 1829. This course is adapted to the needs of University students, as well as to teachers. It is designed to elucidate the economic and political forces of the period in some detail.

3. Seminary in American History. Special work will be provided for graduate students who desire to do research.

GREEK.

Although regular classes are not formed in Greek, Professor Smith will give assistance to students desiring graduate work, and if a sufficient number apply an elementary class will be formed.

LATIN.

1. Cæsar and Virgil. This is offered as a teachers' course, and will deal by means of class exercises and informal lectures with the methods and subjects of Latin instruction in secondary schools. Questions of syntax, Latin pronunciation, "sight reading," and composition are among the subjects that might properly come within the scope of the course. Any of the standard school grammars and editions of Cæsar and Virgil may be used in this work.

   As the aim is not to teach Latin to those who cannot already translate with some facility, the course is open only to those who have completed the ordinary high school course, at least, in Latin or its equivalent.

2. Horace, Selections from the Odes, Satires, and Epistles. This is a reading course intended to meet the needs of teachers and others who desire to supplement their previous reading in Roman literature. Three hours per week; but if so desired by those electing the course, the number of recitation hours will be increased.

GERMAN.

PROFESSOR ROSENSTENGEL.

1. One course only will be offered in this subject. It is not intended for beginners in German as the session of the School is too short to make such a course profitable. It offers to teachers or students who intend to teach German an opportunity of reviewing the grammar and the reader, and of gaining facility in speaking and writing German. Much attention will be paid to the methods of teaching German, especially to the methods necessary for securing the preparation in German which is demanded of students who are to enter the University.

ENGLISH LITERATURE.

PROFESSOR FREEMAN.

Courses 1, 2, and 3 have reference to High School work in Literaature as recommended by the Association of Teachers of English of the North-Central States.

1. Shakespeare. The Midsummer Night's Dream, Merchant of Venice, As You Like It, Twelfth Night, Hamlet. (Hudson's edition preferred.)

2. Chaucer. The Prologue to the Canterbury Tales and the Knight's Tale. (Morris and Skeat's edition.)

3. Milton. Lyrics (L'Allegro, Il Penseroso, Comus, Lycidas), and Book I. of Paradise Lost.

4. Browning. (Corson's Introduction to Browning.) It is not expected that Browning will be taught in High Schools, but this course is offered to those who would like to make the acquaintance of the most difficult, and to many the most attractive poet, of our day.

Three of the above courses will be given; choice to be made according to the wishes of those electing the courses.

LIBRARY SCIENCE.

MISS SHARP.

1. School Libraries. A general course on the use of the school library, designed for teachers. The purpose and scope of these libraries will be emphasized and special attention will be given to methods of reference work with pupils. Instruction will be limited to the subject of school libraries and will not be adapted to those who are studying public library problems.

2. Elementary Library Methods. This course supplements the former as a laboratory course and both should be taken. No text book will be used, but practical work will be given to each student in the branches of library economy necessary in a school library. The simplest methods of arranging, cataloging, lending, and caring for the books will be taught, and no previous knowledge will be assumed. The course will not cover all departments of library economy as it is for small libraries only.

MATHEMATICS.

PROFESSOR SLICHTER.

1. Algebra. A review of the important parts of algebra. The course in algebra is planned with reference to the special needs of high school instructors, and with a view of simplifying and improving instruction in the subject. It is the intention to render the course as helpful as possible to those who are preparing for examination. Wells' Higher Algebra is used.

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. The same general plans are followed in this course as in the course in algebra.

3. Plane Trigonometry and Logarithms. No previous knowledge of the subject will be assumed. There is sufficient time to cover the important portions of the subject.

The instructor in mathematics will be glad to give all the assistance in his power to members of the mathematical classes in addition to the courses outlined above. Correspondence on any point connected with the work is freely invited.

SURVEYING.

MR. SMITH.

1. Elementary Surveying. This course is framed with special reference to the needs of both teacher and practitioner. Only the simple instruments used in surveying will be studied, including several that the student himself can easily construct, or which can be bought for $25 or less.

The principles of the instrumental adjustments of the plane transit, compass, and level will be first studied until the stu-

dent is familiar with the construction and necessary care of such instruments of precision; following this, the student will make such adjustments in the field. The field work will also include an actual farm survey, the data being obtained from the land office, also differential and profile leveling.

This course is the equivalent of Course 2, Topographical Engineering, as given to Sophomore Civil Engineers, and on request of those who pass a satisfactory examination, it will be accredited as such.

2. Advanced Surveying. This will include a study of the higher instruments of precision, the engineer's transit, the plane table, solar compass, sextant, and theodolite, and their use in topographic, hydrographic, city, and geodetic surveying, including observations for latitude and azimuth, longitude, and time. The student will also make a topographical survey of a small parcel of land and plat his notes in a map of same. If preferred the student may make a preliminary railroad survey, taking profile and adjacent topography, and afterwards "run in" the curves giving best location.

An elementary knowledge of plane and spherical trigonometry is desirable.

This course is an equivalent of Course 3, Topographical Engineering, as given to Civil Engineering Sophomores, and on application of those who pass a satisfactory examination will be accepted as such. Text-book, Johnson's Surveying.

The Department of Civil Engineering owns a complete outfit of all the instruments and their accessories included in these courses and which will be used by the student as needed. No fee, except for actual damage, will be required for such use.

The instructor desires to correspond with all who wish to take either of these courses before the opening of the summer school.

PHYSICS.

DR. AUSTIN AND DR. THWING.

It is the object of the Department of Physics to give such work during the Summer School as will best enable the teacher successfully to conduct his classes in the high school. It will, at the same time, afford a valuable enlargement of knowledge to students who have merely a text-book acquaintance with the subject. A

knowledge of an elementary text-book, such as Gage or Avery, will be a useful preparation for the course. Two courses will be given in the subject:

1. A course of lectures will be given daily in which the various branches of the subject will be taken up and discussed as fully as the time will permit. Owing to the prominence now occupied by electricity, more attention will be devoted to the study of this subject than to the others which will also be treated. Throughout the entire course the needs of the teacher will be kept in mind, and the experiments with which the lectures are illustrated will be, in the main, such as can be performed with limited apparatus before a class in the high school.

2. In connection with these lectures there will be offered a course of laboratory practice in which especial attention will be given to acquainting the teacher with such methods and experiments as will aid him in conducting his own classes in physics.

These courses may be profitably taken by students of the classical courses of the University.

CHEMISTRY.

PROFESSOR DANIELLS.

1. Descriptive Chemistry. A lecture course upon the more commonly occurring elements and their combinations, and upon chemical theory as illustrated by the compounds studied. This is illustrated by experiments, and is both for beginners and for those wishing to take a rapid review of the subject.

2. A laboratory course in general chemistry, in which the student will perform his own experiments under the direction of the instructor in charge.

Courses 1 and 2 supplement each other. It is intended that they shall lead the student to observe facts, and to trace the relation between observed facts and those fundamental laws that are included under the general name of chemical theory. On these accounts it is advisable that both courses be taken together.

3. Qualitative Analysis. This course is for those already familiar with the elementary principles of chemistry. Known compounds containing the more important acids and.

bases are first analyzed to familiarize the student with methods of work, and to teach him to observe, classify, and record phenomena, after which unknown salts, both simple and mixed, ores, crude metals, minerals, and substances used in the arts will be analyzed.

4. Quantitative Chemistry. Two lines of work are here offered, both of which include the use of the balance.
   (a) Work in determining the equivalents of elements, the synthesis and analysis of gaseous substances, and the determination of the molecular volumes of gases.
   (b) Quantitative Analysis. The instruction in this course includes both gravimetric and volumetric methods, and is designed to teach the principles underlying the best methods of practice.

A laboratory fee sufficient to cover the cost of material used by each student will be charged.

BOTANY.

PROFESSOR BARNES, DR. TRUE, AND MR. HEALD.

Two courses are offered:

1. The Morphology of Plants. The course will consist of daily laboratory work and lectures and conferences explanatory of the plants studied in the laboratory, the difficulties encountered and questions raised in their study, with special reference to the employment of the same method in secondary schools. Three lectures will given each week.

The laboratory work will occupy two hours daily and will be devoted exclusively to the examination of various types of common plants *with the same instruments and by the same methods* as can be used in ordinary high school courses. Fresh water and marine algæ, moulds, blights, lichens, puff-balls, mushrooms, liverworts, mosses, horse-tails, ferns, and seed-plants will be studied. Directions will be given for collecting and preserving material, and excursions for those interested will show where it is to be obtained. This course is intended to show the modern methods of laboratory study, recommended in the high school manual issued by the State Superintendent. It is intended primarily for teachers, but is open even to those who know nothing of the subjects. It is suited to the wants of University students who desire a short course in Botany.

Those taking this course should have Bessey's Botany or at least Bessey's Essentials of Botany, for reference.

2. The Physiology of Plants. This course will consist of lectures and laboratory work.

Three lectures will be given each week, which are open to those not taking the laboratory work, but will be intended primarily for those who do elect it.

The laboratory work will occupy at least two hours daily under the direction of Dr. True. Experiments which can be carried on with very simple apparatus will be selected and such as are adapted to high school work. The more important facts in the nuitrition, respiration, and movements of plants will be experimentally demonstrated.

Those taking the course will provide themselves with Oel's Experimental Physiology, translated by MacDougal.

Special Courses, consisting of work for which the student's previous training fits him, may be arranged. For such courses materials and instruments will be provided for a small fee (not exceeding $1.00), but to them only general oversight and direction can be given. Students must expect to work largely alone, consulting with instructor for plan of work and assistance in difficulties.

PHYSIOLOGY AND ZOOLOGY.

PROFESSOR BIRGE AND MR. HEALD.

1. Physiology. The plan of the course in Physiology will be substantially the same as in former years. Its aim is to show the meaning and connection of physiological facts to those who have already an elementary knowledge of the facts. An elementary knowledge of the subject will be expected from the student, and the daily exercise will be given to conversations and recitations on points likely to be misunderstood and to those topics which it is desirable to enforce in teaching. The student should be prepared on the general anatomy of the body, on the elementary facts of circulation, digestion, respiration, and nervous action. If such a book as Martin's Human Body, briefer course, has been studied before coming to the school the student will be able to get some profit from the lectures without devoting much time to the study outside of the class-room. A careful reading of the larger book of the same series would be a good preparation for the course on

the part of more advanced students, especially those who have taught physiology. The course will be illustrated by the Auzoux manikin, by models of eye, ear, heart, and brain, and the human skeleton.

2. Elementary Comparative Anatomy. The study in laboratory of the amoeba, hydra, earthworm, clam, crayfish, grasshopper, and frog, with the addition of such other types as the students are able to take. Huxley and Martin's Elementary Biology, Marshall and Hurst's Elementary Zoology, Dodge's Biology, or Colton's Zoology may be used as laboratory handbooks. No student should devote less than two hours per day to this course, and a satisfactory result will hardly be reached unless three or four hours are given. The laboratory work will be accompanied with such recitations as may seem desirable.

3. Elementary Systematic Zoology. The student who intends to take this course will do well to prepare the classification of some text-book as carefully as possible before coming. He can then give all his time to study of specimens, and to the class work. The University has a good set of glass models of protozoa and cœlenterata, alcoholic specimens from the Naples Zoological Institute, covering the invertebrates, except insects, collections of echinoderms, corals, and mollusks, vertebrate skeletons, etc., so that there is ample material for the illustration of the course. The laboratory is well provided with microscopes, simple and compound, and with other apparatus and specimens for the use of students. Courses 2 and 3 may be taken together and can be elected by students of the classical courses in the University as a short course in zoology.

HISTOLOGY.

MR. CARLTON.

1. This course is intended primarily for teachers of physiology. The student will be given a series of sections, prepared from the principal tissues and organs of the animal body, which are intended to illustrate a course in physiology as ordinarily given in high schools. The work will consist of short laboratory talks by the instructor, followed by the mounting and careful studying of these sections by the student under the direction of the instructor. The microscopic preparations will be the property of the student and

may be used to advantage in school work in physiology. *Daily. Hours on consultation.*

2. General Animal Histology. This course will consist of laboratory work in the preparation of the tissues and organs of the animal body. Text-book with recitations. *Hours on consultation.*

GEOLOGY.

PROFESSOR CULVER.

The course in geology will consist of two main parts: 1. Studies in geographic geology, including sculpturing agencies and their work; history of landscape features; glacial history of Wisconsin; movements of the earth's crust in the formation of continents and mountains, in earthquakes and volcanoes. 2. A sketch of geological history, including the life history of the earth, and the history and development of life on the earth.

This course will be planned, to some extent, with reference to the requirements of the State Teachers' examinations. A text-book will be needed, preferably Geikie's or LeConte's. Opportunity for short field excursions will be offered.

For further information regarding the Summer School, address

PROFESSOR J. W. STEARNS,
Madison, Wis.

DEGREES CONFERRED.

COMMENCEMENT, 1895.

BACHELOR OF ARTS.

Ancient Classical Course.

Otto Anderson.
Florence Amanda Dennett.
Edward Jonas.
George Wilson Mead.
Charles James O'Connor.
Jesse Eugene Sarles.
Willet Main Spooner.
Henry Vilas.

History Group.

William Ware Allen.
Charles Richard Barney.

Mathematics Group.

Pearl Eugene Doudna.

Philosophy Group.

Harriet Emeline Crandall.

BACHELOR OF LETTERS.

Modern Classical Course.

Roy Henry Beebe.
Bertha Bleedorn.
Catherine May Clawson.
Edith Aldrich Cowdery.
Adele Maria Graves.
Grace Louise Hopkins.
Helen Julia Kellogg.
Irma Meta Kleinpell.
Frederic Kull.
Carl Gustavus Lawrence.
Lucy Kate McGlachlin.
Patrick Henry Madigan.
Stephen Alexander Madigan.
Thomas Paine Nelson.
Nellie Strong Noyes.
Edmund Pendleton.
Susy Pierce Regan.
Mabel Porter Robinson.
Patrick Rowan.
Arthur Romeyn Seymour.
Alonzo Roswell Smith.
Alice Elizabeth Stephenson.
Minnie Margaret Stiles.
Mary Ada Walker.
Anna Imogene Wyman.
Caroline Morris Young.

English Course.

George Krogh Anderson.
Regina Rosetta Bold.
Frank Favill Bowman.
Kate Dana Bucknam.
Edward Frederick Dithmar.
Robert Ninian Dow.
Mary Stuart Foster.
Stanley Charles Hanks.
Sarah M. Johnson.
Adolph Kanneberg.
Bertha Kellett.
Balthasar Henry Meyer.
David Francis O'Keefe.
Annie Pellow.
Nellie Jewett Rountree.
Ward Beecher Short.
Ada Elizabeth Taylor.
Grace Larkin Terry.
Harry K. White.

Civic-Historical Course.

Charles Leander Baldwin.
Flora Anna Barnes.
Herbert Scott Blake.
Sadie May Bold.
Caroline Viola Burgess.
Chester Dwight Cleveland.
Wheeler Howland.
James Melvin Johnston.
Knox Kinney.
Courtney Wayland Lamoreux.
Dena Lindley.
William H. Newhouse.
Willard Bela Overson.
John Alexander Pratt.
Michael Kiernan Reilly.
Robert E. Rienow.
Joseph Shafer,
Etta Milton Smith.
George Smith Wilson.

History Group.

Belle Abbott.
Catharine Caroline Cleveland.
M. Estelle Hayden.
Miriam Hoyt.

Philosophy Group.

Winifred May Case.

German Group.

Abbie Fiske Eaton.

Mathematics Group.

Ada Martha Parsons.

BACHELOR OF SCIENCE.

General Science Course.

Sarah Edith Brown.
Mary Alice Bulfinch.
Edward Perkins Carlton.
Edgar Ezekiel DeCou.
John Dwight Freeman.
Gertrude Light.
George Malcom McGregor.
Albert Barnes Moses.

Wesson J. Dougan.
Percy Spencer Elwell.
John Hugh Francis.
Eliza Roberts.
Herman Schlundt.
Burt Russell Shurly.
Henry Sherwood Youker.

Botany Group.

Fred. DeForest Heald.

German Group.

Anna May Strong.

Mathematics Group.

Edwin Andrew Hayden.

Mineralogy Group.

Azariah Thomas Lincoln.

Physics Group.

Adam Comstock.
John Enoch Webster.

Zoology Group.

Minnie Marie Enteman.
James Daniel Madison.

Chemistry Group.

Charles Francis Austin.
Francis James Bold.

Geology Group.

Samuel Weidman.

BACHELOR OF SCIENCE IN ENGINEERING.

Civil Engineering Course.

William Alfred Baehr.
Hobart Stanley Bird.
Horace Prentiss Boardman.
William Michael Brennan.
Edward Milton Evans.
George Benjamin Evans.
Heber Lockhart Tibbits.

Mechanical Engineering Course.

Edward Martineau Kurtz.
Bartley Stanchfield.
William Leonard Woodward.

Electrical Engineering Course.

Richard Myron Arms.
Paul A. Biefeld.
Oscar Hansen.
Rudolph John Ochsner.
Rudolph Rosenstengel.
Sidney Roby Sheldon.
Fred David Silber.

BACHELOR OF SCIENCE IN AGRICULTURE.

Gordon Haines True.

GRADUATE IN PHARMACY.

Martin Olaus Braaten.
Hugo Dietz.
Herman Ludwig Emmerich.
Charles William Helbing.
Carl George Hunkel.
Edward Anton Mayer.
Clarence Blackiston Raymond.
William Oscar Richtmann.
Arthur Silber.
Martin Clair Trayser.
Alfred Vivian.
Robert Thomas Williams.

BACHELOR OF LAW.

David William Agnew.
George Thomas Atwood.
Charles Willis Austin.
John Jeremiah Blake.
Alan Bogue, Jr.
Arthur T. Browne.
Albert Ellsworth Buckmaster.
Arthur Clohisy.
William Francis Collins.
Robert Somerville Cowie.
Joseph Mathias Cubela.
Clarence Barker Culbertson.
Jeremiah John Cunningham.
Alexis Proal Davis.
Edward Jonathan Dierks.
John Francis Donovan.
Herman George Dreier.
Oscar Henry Ecke.
Herman Lewis Ekern.
George Ela.
Richard Elsner.
Andrew Engeset.
Charles Albert Engelbracht.
William Lincoln Evans.
Edward Joseph Frawley.
John Thomas Gittings.
Edward Everett Grey.
Leo Haben.
Herbert Oscar Hamilton.
Royal Bryant Hart.
Thomas Breckenridge Hill.
Jay Lytle.
John William Macauley.
Alexander Everet Matheson.
Robert James MacBride.
Arthur William McLeod.
Robert Norman McMynn.
Charles Henry Minshall.
Herman Leon Moses.
Marshall Charles Moss.
Charles Mulberger.
William Byron Naylor, Jr.
Ben Carroll Parkinson.
Henry Gray Parkinson.
Edgar John Patterson.
Clarence Arthur Paul.
John Henry Paul.
Samuel Marcellus Pedrick.
William Barclay Quinlan.
Henry Riggs Rathbone.
Paul Samuel Reinch.
Clarke Milligan Rosecrantz.
Albert Morris Sames.
Charles Seaman.
Philip Sheridan.
Willis Virgil Silverthorn.
Edward Matthews Smart.
Charles Havla Slama.
Charles Philip Spooner.
Carlton M. Stone.
Carl Bernard Ströver.
Claude Rufus Sturtevant.

Lars Henry Johnson.
Arthur Lincoln Jones.
Harry La Fayette Kellogg.
Paul Kerz.
Edward Francis Kileen.
Louis Israel Lefebvre.
Martin Lawrence Lueck.
Theron Upson Lyman.
Patrick Henry Lynch.
Herbert Elbridge Swett.
James Huntington Turner.
William Samuel Wadleigh.
George William Waller.
Paul William Walther.
Charles E. Whelan.
Charles McGee Williams.
Leo Augustus Williams.
Douglas Thompson Winne.
Robert John Wright.

MASTER OF ARTS.

Adam U. Crull, A. B. (Univ. of Ind.), in History—*Thesis:* "*Arguments on Internal Improvements in Monroe's Administration.*"

John Sidney Hotton, A. B. (Univ. of Wis.), in Hebrew—*Thesis*: "*The Authorship of the Book of Isaiah.*"

Frank Hayden Miller, A. B. (Univ. of Wis.), in History—*Thesis:* "*The Development of the Nominating Convention in Pennsylvania.*"

M. Victor Staley, A. B. (Univ. of Wis.), in Sanscrit—*Thesis:* "*The Indo-European Pantheon.*"

Guido H. Stempel, A. B. (Univ. of Ia.), in German—*Thesis:* "*Das Niebelungenlied.*"

Carl Bernard Ströver (Gymnasium at Minden), in Economics—*Thesis:* "*Federal Taxation of Incomes in the United States.*"

MASTER OF LETTERS.

Winifred Sercombe, B. L. (Univ. of Wis.), in History—*Thesis:* "*The Early Development of the Spoils System in Pennsylvania and New York.*"

MASTER OF SCIENCE.

Charles Jason Fenner, B. S. (Univ. of Wis.), in Applied Mathematics—*Thesis:* "*On the Deflection of the Plumb-line Along Lake Cavities of a Certain Form.*"

Henry Freeman Stecker, B. S. (Univ. of Wis.), in Mathematics—*Thesis:* "*The Gebilde* $(x-a)^2+(y-b)^2=r^2$."

MASTER OF PHARMACY.

Leo C. Urban, Ph. G. (Univ. of Wis.), in Pharmaceutical Chemistry. *Thesis:* "*Hydrocymenes and Derivatives.*"

CIVIL ENGINEER.

William Gray Potter, B. C. E. (Univ. of Wis.)—*Thesis: "Machine Methods of Rock Excavation on the Chicago Drainage Canal."*

DOCTOR OF PHILOSOPHY.

Adelbert Grant Fradenburg, A. B. (Alleghany Coll.), in Economics, History, and Jurisprudence—*Thesis: "The Petroleum Industry in the United States."*

HONORARY DEGREES.

Doctors of Law.

Rt. Rev. Samuel Fallows, A. M., D. D., . . .	Chicago, Ills.
Hon. James L. High, A. M., LL. B., ...	Chicago, Ills.
Supt. George W. Peckham, ...	Milwaukee.
Hon. John C. Spooner, A. M., ...	Madison.

HONORS IN SPECIAL STUDIES.

Paul A. Biefeld, in Electrical Engineering—*Thesis: "An Investigation of the Electrolytic Effects of the Return Currents of Electric Railways on Subterranean Iron Pipes."*

Regina Rosetta Bold, in Rhetoric—*Thesis: "The Teaching of English in the Secondary Schools of Wisconsin."*

Fred DeForest Heald, in Botany—*Thesis: "A Contribution in the Comparative Histology of Pulvini, and Their Photœolic Movements."*

Grace Louise Hopkins, in Latin—*Thesis: "Horace as a Literary Critic."*

Helen Julia Kellogg, in French—*Thesis: "Victor Hugo's Theory of the Drama."*

Joseph Shafer, in History—*Thesis: "Suffrage and Representation in Virginia Prior to 1830."*

Herman Schlundt, in Chemistry—*Thesis: "On the Speed of the Liberation of Iodine in Mixtures of Potassium Chlorate, Potassium Iodide, and Hydrochloric Acid."*

Arthur Romeyn Seymour, in French—*Thesis: "Chanson de Roland."*

Fred David Silber, in Electrical Engineering—*Thesis: "An Investigation of the Electrolytic Effects of the Return Current of Electric Railways on Subterranean Iron Pipes."*

Samuel Weidman, in Geology—*Thesis: "On the Quartz Keratophyre of the North Range of the Baraboo Bluffs."*

Caroline Morris Young, in Latin—*Thesis: "Life and Character of Horace, as Revealed in His Works,"*

GRADUATES.

Number of University Graduates, 1854–1894,	2,544	1894,	220
Ancient Classical Course,	316		12
Modern Classical Course,	301		26
English Course,	170		20
Civic-Historical Course,	51		25
General Science Course,	435		26
Normal Course (1865–68),	25		—
Engineering Courses,	174		17
Law Course,	937		81
Pharmacy Course,	124		12
Agricultural Course,	11		1

STUDENTS.

GRADUATES.

FELLOWS.

Allen, Katherine, M. L., ... 228 Langdon St.
Honorary Fellow in Latin.
Bullock, Charles J., A. B., ... 703 State St.
Fellow in Economics, Law Building.
Doudna, Pearl E., A. B., ... 1112 W. Johnson St.
Fellow in Applied Mathematics, Room 27, South Hall.
Gerdtzen, G. Adolph, B. S., ... 403 W. Mifflin St.
Alumni Fellow in Engineering.
Griffith, Jessie, B. L., ... 616 Lake St.
Fellow in German, Room 6, North Hall.
Heald, Fred D., B. S., ... 705 W. Dayton St.
Fellow in Botany, Room 41, Science Hall.
Hunkel, Carl G., Ph. G., ... 301 Murray St.
Fellow in Pharmaceutical Chemistry, Room 12, North Hall.
Libby, Orin G., M. L., ... 205 Lake St.
Fellow in History, Room 11, University Hall.
Mead, John L., M. S., ... 424 Francis St.
Honorary Fellow in Pharmaceutical Chemistry,
Room 12, North Hall.
Robinson, Florence P., M. A., ... 221 Langdon St.
Fellow in Latin, Room 12, University Hall.
Smith, Theodore C., M. A., ... 250 Langdon St.
Fellow in History, Room 12, University Hall.
Stecker, Henry F., M. S., ... 435 Park St.
Fellow in Pure Mathematics, Room 7, University Hall.

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UNIVERSITY SCHOLAR.

Bates, Nellie P., ... 519 Lake St.
B. A. Wellesley College, Economics.

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RESIDENT GRADUATES.

Abbott, Belle, B. L., Univ. of Wis., *Madison.*
History.
Baker, Myron E., B. L., Uni. of Wis.; A. M.,
Harvard University, *Kenosha.*
English Literature.

Barnes, Roscoe A., B. S., Nebr. Wesleyan, Economics. *Lincoln, Neb.*

Brown, Sarah E., B. S., Univ. of Wis., German and Mathematics. *Madison.*

Carlton, Edward P., B. S., Univ. of Wis., Histology and Botany. *Madison.*

Chynoweth, William H., A. M., Lawrence University, Hebrew and New Testament Greek. *McFarland.*

Cornelius, Florence A., B. L., Univ. of Wis., Latin and Greek. *Madison.*

De Cou, Edgar E., B. S., Univ. of Wis., Mathematics. *Madison.*

Dougan, Wesson J., B. S., Univ. of Wis., Hebrew, N. T. Greek, and Philosophy. *Madison.*

Dudley, William H., A. B., Univ. of Wis , History. *Madison.*

Eaton, Abbie F., B. L., Univ. of Wis. Anglo-Saxon and German. *Beloit.*

Farrington, Horace P., M. E., Maine State College, Dairy Husbandry. *Portland, Maine.*

Gale, G. Candee, A. B., Knox College, History and Economics. *Galesburg, Ill.*

Gibbs, William D., M. S., University of Illinois, Agricultural Physics. *Winchester, Ill.*

Hanson, James C., A. B., Cornell Univ., Spanish. *Madison.*

Holbrook, Carlton W., A. B., Upper Iowa University, French, Economics, English Literature. *Merrill.*

Hoverstad, Torger A., B. Agr., University of Minnesota, Animal Husbandry. *St. Anthony Park, Minn.*

Jacobs, Herbert H., A. B., Univ. of Wis., Philosophy. *Whitewater.*

Jennrich, Antony G., A. B., Northwestern University, Pedagogy, French, and Norse. *Milwaukee.*

Johnson, Christian N., A. B., Univ. of Wis., Philosophy and Pedagogy. *Sumner.*

Jonas, Johannes B. E., A. B., Univ. of Wis., Germanic Philology. *Beaver Dam.*

Jones, Edward D., B. S., Ohio Wesleyan University, *Antigo.*
Economics.

Kelley, Frederick T., B. S., Univ. of Wis., *Mineral Point.*
Hebrew, N. T. Greek, Arabic.

Kellogg, Helen J., B. L., Univ. of Wis., *Madison.*
French.

Kræge, Frederick G., B. L., Univ. of Wis., *Madison.*
Philosophy and Economics.

Lerco, Robert, C.E., Polytechnic School, Zurich. *Aoste, Italy.*
Electrical Engineering.

Lyman, Theron U., A. B., Iowa College, and
LL. B., Univ. of Wis., *Madison.*
Law.

Moldstad, Johannes, A. B., Luther College. *De Forest.*
Economics.

Morse, Joseph F., B. A. Amherst, and B. D.,
Yale University. *Madison.*
Economics.

Mossman, Frederick W., B. S., Massachusetts
Agricultural College, *Westminster, Mass.*
Dairy Husbandry.

Nauman, George P., B. S., Northwestern Univ., *Mendota, Ill.*
French and German.

Pyre, James F. A., B. L., Univ. of Wis., *Madison.*
English Literature.

Powers, Will A., B. S., Univ. of Illinois, *Champaign, Ill.*
Dairy Husbandry.

Richtmann, William O., Ph. G., Univ. of Wis., *Arcadia.*
Pharmaceutical Chemistry.

Rogers, Charles B., B. L., Univ. of Wis., *Fort Atkinson.*
Economics.

Sawyer, Arthur R., A. B., Stanford University. *Bunker Hill, Ill.*
Electrical Engineering.

Schlundt, Herman, B. S., Univ. of Wis., *Two Rivers.*
Chemistry.

Seymour, Arthur R., B. L., Univ. of Wis., *Reedsburg.*
French, Latin, Sanskrit.

Sheldon, Sidney R., B. S., Univ. of Wis., *Madison.*
Electrical Engineering.

Strong, Edgar F., B. L., Univ. of Wis., *Madison.*
Economics, History, Sociology.

Vivian, Alfred, Ph. G., Univ. of Wis., Pharmacognosy. *Mineral Point.*
White, Harry K., B. L., Univ. of Wis., History, Hebrew Literature. *Sparta.*
Wasson, James T., A. B., Knox College. Economics. *Galesburg, Ill.*
Yates, Lawrence, Ph. B., Yale University. Biology, Chemistry. *Milwaukee.*

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GRADUATES STUDYING IN ABSENTIA.

Allen, Andrews, B. C. E., Civil Engineering. *Wilmington, Del.*
Angle, Edward John, B. S., M. D., Vertebrate Anatomy. *Philadelphia, Pa.*
Baily, Alice Crawford, B. S., English Literature. *Des Moines, Iowa.*
Baily, William Henry, Ph. B., English Literature. *Des Moines, Iowa.*
Balch, William Monroe, B. L., B. D., Economics. *Mauston.*
Banning, Clara Belle, B. S., Economics. *Willoughby, O.*
Bliss, George Walker, B. L., English and History. *Dallas City, Ill.*
Bristol, Elsie L., B. L., English Literature and History. *Madison.*
Carter, Byron Beach, B. M. E., Mechanical Engineering. *Chicago, Ill.*
Chandler, Mary Saxe, B. L., English Literature. *Chicago, Ill.*
Christie, Ruth Annie, B. L., English Literature. *De Pere.*
Cline, W. T., A. M., Ph. D., Economics. *Exeter, Neb.*
Ela, Mary Hazeltine, B. L., English Literature. *Rochester.*
Green, Howard, B. L., History. *Milwaukee.*
Hall, Frank W., A. B., English Literature. *Madison.*
Hatherell, Rosalia, B. S., Zoology. *River Falls.*
Hopkins, William Henry, B. L., Hebrew. *Chicago, Ill.*

Lardner, Henry Ackley, B. S., *Oconomowoc.*
Electrical Engineering.
Marshall, Ruth, B. S., *Fond du Lac.*
Zoology.
Miller, Charles S., A. B., *Madison.*
English Literature.
Nelson, Milton Orlup, B. L., *Minneapolis, Minn.*
Economics.
Powell, Gregory John, A. B., B. D., *Omaha, Neb.*
Economics.
Raymond, Jerome Hall, A. B., *Chicago, Ill.*
Economics and History.
Richards, Walter Joseph, B. S., *Pittsburgh, Pa.*
Electrical Engineering.
Steere, Eugene A., B. S., *Helena, Mont.*
Geology.
Sterling, Charles Gordon, A. B., Ph. D., *Omaha, Neb.*
Hebrew.
Ramsey, George S., M. A., *Albuquerque, New Mexico.*
Economics.
Swain, Henry Huntington, M. A., *Yankton, S. D.*
Economics.
Swenson, Anna Dinsdale, B. L., *Chicago, Ill.*
English Literature.
Swenson, Magnus, B. M. E., *Chicago, Ill.*
Mechanical Engineering.
Thomas, Edward Kirby, B. L. (Eng.), *West Superior.*
English Literature.
Trousdale, Samuel Whitney, A. M., B. D., Ph. D., *La Crosse.*
Economics.
Updyke, Frank A., A. B., *Atlanta, Ga.*
Economics.
Whitton, Frederick Harvey, A. B., *Detroit, Mich.*
History.

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UNDERGRADUATES.

COLLEGE OF LETTERS AND SCIENCE.

Senior Class.

Allen, Cora,	*Madison,*	Eng.
Allen, Harry Eugene,	*Madison,*	G. S.
Armstrong, Mary,	*Portage,*	G. S.
Baker, Helen Augusta,	*Madison,*	A. C.

Ball, Farlin Herbert,	*Oak Park, Ill.*,	A. C.
Ball, Wilbur Laing,	*Madison*,	A. C.
Barber, Frank William,	*Christie*,	Eng.
Bassett, Agnes Stone,	*Madison*,	M. C.
Beffel, John Marshall,	*Racine*,	G. S. (Zool. Group).
Bolton, Herbert Eugene,	*Tomah*,	C. H.
Brown, Helen Lucy,	*Rhinelander*,	M. C.
Buckley, Ernest Robertson,	*Madison*,	G. S. (Geol. Group).
Bulfinch, Arthur Fletcher,	*Juda*,	Eng. (Phil. Group).
Bunting, Alice Isabella,	*La Crosse*,	A. C.
Burton, George,	*Annaton*,	G. S.
Cady, Samuel Howard,	*Madison*,	M. C. (Phil. Group).
Callecod, Ole Larson,	*Paxton, Ill.*,	C. H.
Campbell, Mary,	*Milwaukee*,	Eng.
Carhart, George Arthur,	*Milwaukee*,	G. S.
Cassels, Edwin Henry,	*Tomah*,	A. C.
Chynoweth, Edna Ruth,	*Madison*,	M. C. (Hist. Group).
Cramer, Mary Allison,	*Madison*,	M. C.
Cunningham, Wilson,	*Cobb*,	G. S.
Ellsworth, Laura,	*Barron*,	G. S.
Everett, Mary Louise,	*Oshkosh*,	M. C.
Fairchild, Albert Turner,	*Marinette*,	A. C.
Falvey, Katherine Mary,	*Baraboo*,	Eng.
Ferris, Will Chester,	*Waupaca*,	C. H.
Flint, Anna Katherine,	*Menomonie*,	Eng.
Ford, Guy Stanton,	*Plainfield, Ia.*,	C. H.
Foster, Guy Leroy,	*Madison*,	Eng. Sp.
Frazier, Charles Ross,	*Sparta*,	C. H.
Fulton, Grace,	*Hudson*,	C. H.
Gale, Zona,	*Portage*,	M. C.
Gittins, Elmer Elsworth,	*Racine*,	C. H.
Gollmar, Arthur Howard,	*Baraboo*,	A. C.
Goodell, Richard Albert,	*Ipswich*,	C. H.
Graves, William Roswell,	*Boscobel*,	C. H.
Gray, Alfred William,	*Milwaukee*,	A. C.
Green, Grace Nellie,	*Monroe*,	M. C.
Greenbank, George Herbert,	*Madison*,	M. C.
Griffith, Anna Cecilia,	*Madison*,	A. C.
Hallowes, Clara Louise,	*Madison*,	G. S.
Hand, Jessie Louise,	*Racine*,	M. C.
Harder, Herman Peter,	*New Holstein*,	G. S. (Zool. Group).
Harris, J. Earl,	*Reedsburg*,	G. S.
Harris, Juliet Parker,	*Reedsburg*,	Eng.
Henderson, Bertina,	*Cambridge*,	Eng. Sp.

Herrmann, Charles,	*Sterling, Ill.*,	G. S.
Hicks, Ernest Levi,	*Oshkosh*,	G. S.
Hodges, Frank Lewis,	*Monroe*,	G. S.
Holt, Robert Lincoln,	*Waukesha*,	C. H.
Hough, Alexander George,	*Racine*,	G. S. (Phil. Group).
Jones, Charles Wickham,	*Dodgeville*,	C. H.
Judge, Ina,	*Darlington*,	Eng.
Kimball, Bertha Clough,	*Madison*,	G. S.
Kimball, Edna Gertrude,	*Madison*,	M. C.
Kingsley, George Almon,	*Madison*,	A. C.
Knapp, George Nelson,	*Madison*,	G. S. (Geol. Group).
Luetscher, John Arthur,	*Sauk City*,	G. S.
Lyle, Edith K.,	*Madison*,	C. H.
Lyon, Edith Adel,	*Sioux City, Ia.*,	M. C.
MacGregor, Nellie Bly,	*Eau Claire*,	M. C.
Mandt, Clara Josephine,	*Stoughton*,	Eng.
Marshall, Victor Fred,	*Appleton*,	G. S.
Mason, Vroman,	*Madison*,	C. H.
Maynard, Myra Edith,	*Hawarden, Ia.*,	M. C.
McGregor, Margaret Elizabeth,	*Stevens Point*,	M. C.
McMinn, Amelia,	*Chicago, Ill.*,	G. S.
McVicar, Mary Christiana,	*Madison*,	M. C.
McWhorter, John Scott,	*Buckhannon, W. Va.*,	Eng. (Phil. Group).
Meinhardt, Antoinette Marie,	*Burlington*,	G. S. (Math. Group).
Menke, Henry,	*De Witt, Neb.*,	Eng. (Phil. Group).
Mills, Elizabeth Bennett,	*Madison*,	G. S.
Norton, Irene Celia,	*Elkhorn*,	M. C.
Obenhaus, Herman F. A.,	*Prescott*,	M. C. (Heb. Group).
O'Connor, Leonora Francis,	*Madison*,	M. C.
Olson, Oscar Alexander,	*Chicago, Ill.*,	G. S. (Zool. Group).
O'Neil, George Edwin,	*Milwaukee*,	C. H.
Palmer, Elizabeth Marshall,	*Madison*,	Eng. Sp.
Parker, Barton Lessey,	*De Pere*,	C. H. (Hist. Group).
Parman, Ida Lillian,	*Mazomanie*,	M. C.
Pendleton, Mary Lucy,	*Sioux City, Ia.*,	M. C.
Peterson, Fred William,	*Bonduel*,	A. C.
Pierce, Frank Ellis,	*Madison*,	G. S. Sp.
Pomeroy, Flavia Marie,	*Edgerton*,	Eng. (Phil. Group).
Pretts, William Walter,	*Madison*,	G. S.
Prevey, Commodore E.,	*Elroy*,	C. H.
Raish, Edward Lester,	*Akron, Ia.*,	M. C.
Richardson, Helen Cornelia,	*Sparta*,	M. C. (Math. Group).
Richardson, Julia Baker,	*Davenport, Ia.*,	M. C.
Roberts, Frederick Charles,	*Dodgeville*,	G. S.

Rohn, Oscar,	*Jackson*,	G. S. (Min. Group).
Ross, Gertrude Clark,	*Sioux City, Ia.*,	M.C. (Phil. Group).
Ryan, John Elbert,	*Andover*,	C. H. Sp.
Salisbury, Oliver Maxson,	*Whitewater*,	G. S.
Schaper, William August,	*St. Joseph*,	C. H.
Scheibel, Martha Clare,	*Madison*,	M. C.
Schuette, Albert B.,	*Manitowoc*,	C. H.
Sheldon, George Matthew,	*Brandon*,	C. H.
Shepherd, Jessie,	*Madison*,	M. C.
Simons, Algie Martin,	*Baraboo*,	C. H. (Econ. Group).
Smith, Marietta Baldwin,	*Racine*,	C. H.
Smith, Ralph Elbert,	*Waupun*,	C. H. (Hist. Group).
Spiegelberg, Elizabeth,	*Boscobel*,	Eng. (German Group).
Steenberg, Bessie,	*Waupaca*,	M. C.
Steensland, Halbert Severin,	*Madison*,	G. S.
Swiler, George Christopher,	*Delavan*,	A. C.
Tarnutzer, Anna Elizabeth,	*Madison*,	G. S.
Ten Eyck, Lena Amelia,	*Brodhead*,	C. H.
Thomas, Caroline Eames,	*Green Bay*,	M. C.
Thomas, Frederick Willis,	*Eau Claire*,	C. H.
Thorp, Mary Isabella,	*Madison*,	M. C.
Tilden, Charles Stephen,	*Madison*,	G. S.
Tillotson, Roy Delancy,	*Waupun*,	C. H. (Math. Group).
Tormey, James Albert,	*Richland Center*,	C. H.
Urness, Peter Henry,	*Madison*,	Eng.
Van Vleet, Albert H.,	*Nickerson, Kan.*,	G. S.
Vernon, Florence Eugenia,	*Madison*,	M. C.
Walbridge, Fannie Rose,	*Madison*,	Eng.
Warren, Clyde La Fayette,	*Green Bay*,	M. C.
Welles, Frances Bradley,	*Milwaukee*,	G. S.
Winter, Herman,	*Madison*,	M. C.
Wolcott, John Dorsey,	*Penn Yan, N. Y.*,	A. C.

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Junior Class.

Aasen, Andrew,	*Deerfield*,	Eng. Sp.
Alsted, Lewis Losey,	*Milwaukee*,	C. H.
Amazeen, John Brown,	*Milwaukee*,	A. C.
Arndt, Walter Tallmage,	*West Superior*,	C. H.
Barton, Albert,	*Mt. Vernon*,	Eng. Sp.
Becker, C. Lotus,	*Waterloo, Ia.*,	C. H.
Beebe, Paul Arthur,	*Marshall*,	G. S. Sp.
Bleyer, Willard Grosvenor,	*Milwaukee*.	M. C.
Blomgren, Charles Edwin,	*Chicago, Ill.*,	G. S.
Bolton, William Lawrence,	*Racine*,	C. H. (Hist. Group).

Bostwick, Eva Huling,	*Janesville,*	M. C.
Brazeau, Theodore Walter,	*Grand Rapids,*	Eng. Sp.
Bucey, Caro Louise,	*Madison,*	M. C.
Burgess, Ezra Ray,	*Racine,*	C. H.
Bushnell, Ida May,	*Burlington,*	M. C. Sp.
Carlton, Mary Louise,	*Madison,*	C. H.
Conway, William James,	*Rudolph,*	Eng. Sp.
Copeland, Herbert Bingham,	*Monroe,*	C. H.
Copeland, Louis Albert,	*Shullsburg,*	Eng. Sp.
Cornish, Francis Vincent,	*Myra, Minn.,*	C. H.
Craig, Jessie Catharine,	*Russell, Ontario,*	Eng. Sp.
Crooker, Orin Edson,	*Helena, Mont.,*	G. S. Sp.
Daniells, Ralph Peabody,	*Madison,*	G. S. Sp.
Devlin, Sarah Rosetta,	*Woodworth,*	C. H.
Dolph, Cyrus,	*Brookfield,*	C. H.
Eager, Gertrude,	*Evansville,*	M. C. Sp.
Edgren, Carrie J.,	*Madison,*	M. C.
Esterley, Burton H.,	*Minneapolis, Minn.,*	G. S. (Phil. Group).
Fehr, Henry,	*Milwaukee,*	G. S.
Fehr, Jacob, Jr.,	*Milwaukee,*	C. H.
Frame, William Somerville,	*Waukesha,*	C. H.
Freeman, Charlotte Brockway,	*Madison,*	M. C.
Gallagher, Sadie Ellen,	*Madison,*	Eng.
Gile, Durante Carlyle,	*Madison,*	A. C.
Gillen, Martin James,	*Racine,*	C. H.
Goetsch, Hattie Louise,	*Watertown,*	Eng.
Gordon, James Curtiss,	*Madison,*	G. S.
Gray, Oliver,	*Platteville,*	G. S.
Grosvenor, Thomas Howard,	*St. Cloud, Minn.,*	C. H.
Guile, Ella May,	*Wauwatosa,*	G. S.
Gunther, Laura Marion,	*Madison,*	Eng.
Hager, Albert Ralph,	*Sterling, Ill.,*	G. S.
Hambrecht, George Phillip,	*Lake Geneva,*	C. H.
Harding, Harry Alexis,	*Chicago, Ill.,*	G. S.
Harmon, Winifred Eleanor,	*Oshkosh.*	C. H.
Haviland, Dora Luella,	*Janesville,*	M. C.
Hayden, Georgia H.,	*Eau Claire,*	M. C.
Healy, James Thomas,	*Beaver Dam,*	Eng.
Hedler, Albert,	*Milwaukee,*	C. H.
Hocking, William Joseph,	*Darlington,*	C. H.
Holcombe, Fanny Jewell,	*Whitewater,*	Eng.
Hood, Gertrude Bethel,	*Ripon,*	C. H.
Hoover, Eugenia,	*Shullsburg,*	C. H.
Iwert, Alvin Henry,	*Milwaukee,*	M. C.

Jackson, Russell,	*Madison,*	A. C. Sp.
James, Victoria,	*Eau Claire,*	M. C. Sp.
Johns, William Henry,	*Dodgeville,*	Eng. Sp.
Johnson, Ellen,	*McFarland,*	Eng.
Johnson, Fred Gordon,	*Oregon,*	G. S. Sp.
Johnson, Reginald Hall,	*Watertown,*	A. C.
Jones, David R.,	*Waterville,*	A. C.
Jones, Lillian,	*Racine,*	M. C. (Math. Group).
Jones, Thomas John,	*Dodgeville,*	Eng.
Jones, Thomas R. Lloyd,	*Hillside,*	G. S.
Kalaher, Michael William,	*Lake Geneva,*	C. H.
Katzenstein, George,	*Milwaukee,*	G. S.
Kennicott, Belle,	*Madison,*	M. C. Sp.
Kingsford, Albert Samuel,	*Rushford, Minn.,*	C. H.
Kinsman, Delos Oscar,	*Platteville,*	C. H.
Kittell, John Albert,	*De Pere,*	C. H.
Kuhnhenn, Amelia Wilhelmina,	*Mineral Point,*	Eng.
Lanphier, Phœbe Anne,	*Janesville,*	M. C.
Leith, Charles Kenneth,	*Madison,*	G. S. Sp.
Liegler, John Henry,	*Racine,*	C. H.
Lowell, Frances Adams,	*Waupaca,*	G. S.
Lucas, Frank Warren,	*Brodhead,*	M. C.
Lyon, Judd Stuart,	*Sioux City, Ia.,*	M. C. Sp.
Maine, Ellen Lucy,	*Stevens Point,*	M. C. Sp.
Maloney, David William,	*Elk Creek,*	C. H.
Maybury, James Henry,	*St. Cloud, Minn.,*	C. H.
McCard, Harry Stanton,	*Rockford, Ill.,*	G. S.
McCoy, Mabel,	*Lancaster,*	C. H.
McNab, Joseph Lowe,	*Evanston, Ill.,*	C. H.
Medbury, Fannie Knapp,	*Oshkosh,*	Eng.
Miller, Florence Emaretta,	*Madison,*	Eng. Sp.
Miller, George Harry,	*Winneconne,*	A. C.
Moody, George Scott,	*Yuba,*	C. H.
Moore, Anna Louise,	*Madison,*	C. H.
Nichols, Augusta Mae,	*Madison,*	M. C.
Noyes, Harry Jennings,	*Milwaukee,*	C. H.
Ochsner, Benjamin James,	*Milwaukee,*	G. S. (Zool. Group).
Page, Harlan Kingsbury,	*New York, N. Y.,*	A. C. Sp.
Paul, Alexander,	*La Crosse,*	Eng. Sp.
Peters, Susie Mary,	*Milwaukee,*	Eng.
Peterson, Isaac Peter,	*Alderly,*	C. H.
Phelps, Charles Austin,	*Madison,*	M. C. (Hist. Group).
Pitman, Anna Marie,	*Madison,*	A. C.
Porter, Susan Melvina,	*Janesville,*	Eng.

Reel, Irma,	*Milwaukee*,	Eng.
Reindahl, Amund Kittelsen,	*Madison*,	M. C. Sp.
Reynolds, Everett Adelbert,	*Bassett*,	Eng.
Rice, Oliver Eugene,	*Downing*,	G. S.
Richards, John Robertson,	*Lake Geneva*,	C. H.
Robinson, Edith Porter,	*Milwaukee*,	M. C. Sp.
Rowan, Emma Frances,	*Sparta*,	C. H.
Ruddick, Richard Albert,	*Ingersoll, Ont.*,	A. C. (Heb. Group).
Sanborn, John Bell,	*Madison*,	M. C. Sp.
Sawyer, Hiram Arthur,	*Hartford*,	Eng.
Schmidt, Albert Henry,	*Manitowoc*,	C. H.
Shearer, Blanche,	*Green Bay*,	M. C. Sp.
Sheldon, Walter Hodge,	*Madison*,	A. C.
Sheppard, William Henry, Jr.,	*Montford*,	C. H.
Shockley, Harlow Orville,	*Lamont*,	G. S.
Showerman, Grant,	*Brookfield*,	A. C.
Shuart, Charles Day,	*Kenosha*,	G. S.
Sikes, George Reuben,	*Sharon*,	A. C.
Skinner, Frank Norborne,	*Madison*,	G. S. Sp.
Smith, Carrie Frederica,	*Madison*,	M. C.
Smith, Charles Marquis,	*Racine*,	G. S.
Smith, Elizabeth Church,	*Madison*,	Eng. (Phil. Group).
Smithyman, William Lincoln,	*Platteville*,	C. H.
Spence, Mary,	*Fond du Lac*,	A. C.
Suydam, Vernon Andrew,	*Towne*,	G. S. Sp.
Tallman, William Duane,	*Madison*,	G. S. (Math. Group).
Tarrant, Shirley Brooks,	*Durand*,	C. H.
Thomas, James E.,	*Delafield*,	A. C. (Heb. Group).
Thompson, George,	*Oconto*,	G. S.
Thompson, Thomas S.,	*Mt. Horeb*,	C. H.
Torgerson, Martha Florence,	*Madison*,	M. C.
Urdahl, Margerethe,	*Madison*,	M. C.
Utendorfer, William Elmer,	*Reedsburg*,	G. S.
Virgin, Georgie Irene,	*Platteville*,	M. C.
Walsh, James Alexander,	*Centralia*,	Eng.
Ward, Louis Merrick,	*Milwaukee*,	C. H. (Hist. Group).
Warning, Anna,	*Elkhorn*,	M. C.
Webster, Thomas,	*Elk Grove*,	G. S.
Wehmhoff, Emma Clara F.,	*Burlington*,	M. C.
Weinzirl, John,	*Eau Galle*,	G. S.
Welsh, Iva Alice,	*Madison*,	C. H.
Westover, Calla Phœbe,	*Madison*,	G. S. (Math. Group).
Wilder, George Walker,	*Cooksville*,	G. S. (Physics Group).
Witter, Isaac Phelps,	*Grand Rapids*,	C. H.
Wootton, Addimay,	*Madison*,	M. C.

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Sophomore Class.

Atwell, Rawlins,	*Milwaukee,*	C. H.
Atwood, Augusta,	*Madison,*	Eng.
Atwood, David,	*Madison,*	M. C. Sp.
Bacon, John Harwood,	*La Crosse,*	M. C.
Barker, Mary Rogers,	*Janesville,*	C. H.
Barling, Ada May,	*Milwaukee,*	Eng. Sp.
Benson, Gideon,	*Richland Center,*	G. S. Sp.
Berryman, Clara Maude,	*Madison,*	M. C.
Bertles, Mary Ione,	*Green Bay,*	M. C.
Blackburn, Thomas Brodgen,	*Omro,*	C. H.
Blynd, George Theophilus,	*Weywauwega,*	A. C.
Brand, Bessie Goodrich,	*Madison,*	M. C.
Brewer, Chester Leland,	*Evansville,*	M. C.
Briesen, Elizabeth J. von,	*Columbus,*	M. C.
Briesen, Julia Hattie von,	*Columbus,*	M. C.
Broughton, William Simmons,	*Dwight, Ill.,*	C. H.
Butt, Cyrus Marion, Jr.,	*Viroqua,*	C. H.
Cantwell, Joseph Michael,	*Madison,*	C. H.
Case, Henry Cadby,	*Milwaukee,*	C. H.
Chandler, Albert James,	*Ladoga,*	C. H.
Chapman, Bertha Estelle,	*Plainfield,*	Eng.
Chase, Albert Guy,	*Ladoga,*	Eng. Sp.
Clawsen, Fred Harold,	*Fox Lake,*	C. H.
Clawson, Sadie Marie,	*Brodhead,*	C. H.
Cochems, Henry,	*Sturgeon Bay,*	C. H.
Coe, Joseph Spaulding,	*Whitewater,*	M. C.
Comstock, Elizabeth,	*Madison,*	G. S.
Connor, Sarah,	*Token Creek,*	M. C. Sp.
Corscot, Catherine May,	*Madison,*	A. C.
Cushing, Alice Gertrude,	*Wauwatosa,*	C. H.
Denglar, Rose,	*Madison,*	C. H.
Dern, Henry,	*Wausau,*	G. S. Sp.
Dorr, Frank Berry,	*Shullsburg,*	C. H.
Downer, George Ford,	*Lake Geneva,*	C. H.
Doyon, Bertrand Herrick,	*Madison,*	C. H.
Edwards, Clarence Bushnell,	*Lancaster,*	C. H.
Evans, Evan Alfred,	*Spring Green,*	Eng.
Fairchild, Arthur Wilson,	*Marinette,*	M. C.
Fish, Victoria,	*Madison,*	M. C. Sp.
Ferguson, Herbert Thomas,	*Waupun,*	C. H.
Ford, William Brown,	*Sparta,*	G. S. Sp.
Gannon, Walter Scott,	*Cedarburg,*	C. H.
Gault, John Henry,	*Poynette,*	C. H.

Gilbertson, Julius,	*Eau Claire*,	C. H.
Giss, August John,	*Sauk City*,	C. H.
Goodwin, Iva Frances,	*Madison*,	Eng. Sp.
Goodyear, Alva Stewart,	*Tomah*,	C. H.
Graham, John Gray,	*Tomah*,	M. C.
Greenwood, Charles Sheen,	*Lake Mills*,	C. H.
Griffiths, Mayme Edna,	*Madison*,	M. C.
Hanson, Edward Smith,	*Monroe*,	M. C. Sp.
Hase, William Frederick,	*Milwaukee*,	C. H. Sp.
Harvey, William Thomas,	*Racine*,	G. S. Sp.
Hastreiter, Rolland Frederick,	*Madison*,	G. S.
Helm, Ida E.,	*Madison*,	Eng.
Heyn, Bernard Goldsmith,	*Milwaukee*,	C. H.
Higgins, Allen Fitch,	*Sturgeon Bay*,	G. S.
Houghton, Anna Pauline,	*Racine*,	Eng, Sp.
Hoyt, Heber Bishop,	*Waterloo*,	C. H.
Hughes, Walter Wellington,	*New Lisbon*,	C. H.
Jackman, Ralph Wilmerth,	*Janesville*,	C. H.
Jackson, Reginald Henry,	*Madison*,	G. S. Sp.
Jones, Clara,	*West Bend*,	C. H.
Jones, Nettie,	*Arena*,	Eng.
King, Elizabeth,	*Spring Green*,	C. H.
Laflin, Mamie Luella,	*Milwaukee*,	M. C.
Laube, Frank Joseph,	*Brodhead*,	Eng.
Lea, Charles Winthrop,	*Waupaca*,	C. H.
Libbey, Charles Arthur,	*Oshkosh*,	C. H.
Liebenberg, Hermann Henry,	*Waumandee*,	G. S. Sp.
Link, George Martin,	*Leon*,	C. H.
Lockney, Henry,	*Waukesha*,	C. H.
Loomis, Grace,	*La Crosse*,	G. S. Sp.
Luby, Clarence Joseph,	*Hurley*,	C. H.
Lynch, John Kinney,	*Oshkosh*,	C. H.
Mabbett, Leora Esther,	*Edgerton*,	Eng.
Mann, William Henry,	*Marinette*,	M. C.
Marlow, John Anthony,	*Decorah, Ia.*,	M. C.
McCulloch, Isabella Jane,	*Janesville*,	C. H.
McFetridge, Georgiana,	*Baraboo*,	M. C. Sp.
McGilvra, Avis Aurelia,	*Baraboo*,	M. C.
McLenegan, Annie S.,	*Beloit*,	Eng.
McVicar, Agnes Edna,	*Madison*,	M. C. Sp.
McVicar, Katharine Eunice,	*Madison*,	M. C. Sp.
Melville, Naomi Earhart,	*Davenport, Ia.*,	M. C.
*Meyer, George William,	*Paoli*,	C. H.
Middlekauff, Luella,	*Polo, Ill.*,	Eng. Sp.

* Died, March 28, 1895.

Miller, John Oscar,	*Marinette,*	A. C.
Mitchell, Howard Edwin,	*Milwaukee,*	C. H.
Monahan, Barney Andrew,	*East Troy,*	Eng.
Montgomery, Charles Carroll,	*Omaha, Neb.,*	A. C.
Murat, Leroy John,	*Stevens Point,*	C. H.
Nash, Guy,	*Centralia,*	G. S.
Nash, Nellie Irene,	*Centralia,*	C. H.
Norton, William Clarence,	*Elkhorn,*	C. H.
O'Brien, Rose Anna,	*Elkhorn,*	M. C.
Oestreich, Otto August,	*Kewaunee,*	C. H.
Osborne, Laura Alma,	*La Crosse,*	M. C.
Palmer, Helen,	*Madison,*	M. C. Sp.
Park, Ernest Sprague,	*Des Moines, Ia.,*	G. S. Sp.
Parkinson, Eva,	*Madison,*	A. C.
Parkinson, Fay,	*Madison,*	M. C.
Parkinson, Maude,	*Madison*	A. C.
Parsons, Frederick Francis,	*Berlin,*	C. H.
Pengra, Charlotte Elvira,	*Madison,*	Eng.
Perkins, Henry Addison,	*Sioux City, Ia.,*	M. C. Sp.
Pittman, Matthias Bovee, Jr.,	*Boscobel,*	C. H.
Pound, Martha Edith,	*Madison,*	M. C.
Powell, William Anson,	*La Crosse,*	C. H. Sp.
Proctor, Ino,	*Madison,*	Eng. Sp.
Pyre, Walton Hawkins,	*Madison,*	M. C.
Rehn, Valentine Lawrence,	*Marshall,*	C. H.
Rickfort, William Otto,	*Lake Mills,*	G. S.
Risjord, Gullick Nelson,	*Mount Horeb,*	C. H.
Rogers, John Jay,	*Milwaukee,*	G. S.
Sames, Ellen Daisy,	*Rockford, Ill.,*	Eng. Sp.
Sawyer, Philetus Horace,	*Oshkosh,*	C. H.
Schreiber, Lucile Howard,	*Milwaukee,*	A. C.
Serl, Elmer Willis,	*Delavan,*	Eng. Sp.
Smelker, Roy C.,	*Dodgeville,*	Eng.
Smieding, George,	*Racine,*	G. S.
Smith, Edna E.,	*Amherst,*	Eng.
Smith, Ernest Bradford,	*Madison,*	M. C.
Smith, Mary Emily,	*Wausau,*	G. S.
Smith, William Noble,	*Cresco, Ia.,*	C. H.
Spence, Caroline Devereaux,	*Fond du Lac,*	A. C.
Spence, Gertrude,	*Milwaukee,*	G. S.
Stavrum, Ernst Arthur,	*La Crosse,*	M. C.
Stowe, Willard Arthur Lovel,	*Neenah,*	G. S. Sp.
Strock, Linius Lehmann,	*Sterling, Ill.,*	A. C. Sp.
Thomas, Sarah Jennie,	*Waukesha,*	M. C.

Thorp, Maud Louisa,	*Madison*,	M. C. Sp.
Tillotson, Earle Clarence,	*Baraboo*,	M. C.
Torbe, Leo,	*Milwaukee*,	C. H. Sp.
Waite, Ossian Thomas,	*Oshkosh*,	C. H.
Whitmore, Eugene Rodolph,	*Fennimore*,	G. S.
Wigdale, Norman Amos,	*Ft. Atkinson*,	Eng. Sp.
Wild, Robert,	*Milwaukee*,	A. C.
Willson, Ernest Martin,	*Madison*,	C. H.
Woodard, Morrison C.,	*Clinton*,	M. C. Sp.
Wright, Albert Orville, Jr.,	*Madison*,	M. C. Sp.
Wright, David Howard, Jr.,	*Madison*,	G. S. Sp.
Wright, Grace Anna,	*Janesville*,	M. C. Sp.
Zweifel, Arabella V.,	*Calumetville*,	M. C.
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Freshman Class.

Ableiter, Theodore Louis,	*Boscobel*,	A. C. Sp.
Alexander, Albert Fred,	*Menomonie*,	G. S.
Allen, Florence Eliza,	*Madison*,	C. H.
Anderson, Earle Steele,	*Madison*,	Eng. Sp.
Bailey, Grace Ethel,	*Sun Prairie*,	C. H.
Baldwin, Floyd McKannon,	*Kendall*,	G. S. Sp.
Bartram, William Henry, Jr.,	*Fort Howard*,	C. H.
Berg, Theodore,	*Appleton*,	Eng.
Binzel, Anna Marie,	*Oconomowoc*,	Eng.
Bird, Louise Marie,	*Madison*,	M. C.
Blachly, Ada Estelle,	*North Freedom*,	Eng. Sp.
Bliss, Eleanor Beattie,	*Madison*,	Eng. Sp.
Bliss, Ida M.,	*Baraboo*,	M. C.
Blumer, Edward,	*Farmer's Grove*,	G. S.
Blyman, J. Charles,	*Oshkosh*,	M. C.
Bobb, Clement Luesther,	*Madison*,	G. S.
Bolton, Ernest LeRoy,	*Tomah*,	G. S.
Borgers, Albert Lewis,	*Neillsville*,	Eng.
Bosshard, Otto,	*La Crosse*,	C. H.
Bowers, Ray,	*Delavan*,	G. S.
Bradley, Mabelle Helen,	*Beloit*,	Eng. Sp.
Bright, Benjamin Herbert,	*Black River Falls*,	C. H.
Bump, Mary Evelyn,	*Wausau*,	C. H.
Bunge, William Henry,	*Eitzen, Minn.*,	C. H.
Burns, Leslie Rush,	*Oakfield*,	Eng.
Burnton, Harriot,	*Fond du Lac*,	M. C.
Burton, Helen Mary,	*La Crosse*,	M. C. Sp.
Bush, Nellie Martha,	*Sparta*,	M. C.
Cairns, Rolla Ullin,	*Ellsworth*,	G. S. Sp.

Carver, Jessie A.,	*Reedsburg,*	Eng. Sp.
Cary, Irving Boyd,	*Milwaukee,*	A. C.
Case, Jessie Marvin,	*North Greenfield,*	G. S.
Chapman, Agnes,	*Watertown,*	M. C.
Charleton, Fannie,	*Madison,*	Eng.
Church, May Elizabeth,	*Milwaukee,*	C. H.
Colver, Harley Ross,	*New Lisbon,*	C. H.
Compton, Frank Elbert,	*Grand Rapids,*	C. H.
Copp, Helen L.,	*Madison,*	M. C. Sp.
Cory, Walter Bennett,	*Viroqua,*	C. H.
Cronk, Fanny Elsie,	*Oregon,*	G. S. Sp.
Dacy, Alice Beatrice,	*Woodstock, Ill.,*	Eng.
Damuth, Libby M.,	*Fort Atkinson,*	M. C. Sp.
Dangers, Lillie Louise,	*Neillsville,*	M. C.
Davies, Joseph Edward,	*Watertown,*	M. C.
Davis, David John,	*Racine,*	G. S.
Day, Alice Beatrice,	*Woodstock, Ill.,*	Eng.
Day, John Francis,	*Janesville,*	C. H.
Denniston, Rollin Henry,	*Burlington,*	G. S.
Donovan, Mary Elizabeth,	*Madison,*	Eng. Sp.
Dow, Ethel,	*Stoughton,*	Eng. Sp.
Dudley, George,	*Canastota, S. D.,*	Eng. Sp.
Duke, Hugo Sylvester,	*Milwaukee,*	A. C. Sp.
Edgren, Jessie Lewis,	*Madison,*	C. H.
Ela, Emerson,	*Rochester,*	M. C.
Elser, Robert Charles,	*Milwaukee,*	G. S.
Elver, Elmore Theodore,	*Madison,*	C. H.
Engeset, Emma,	*De Forest,*	Eng.
Enteman, Karl Ernest,	*Hartland,*	C. H.
Evert, Fred V.,	*Middleton,*	Eng. Sp.
Fabrick, Glen Roy,	*Harlem, Ill.,*	G. S.
Farrish, Catharine Edna,	*Grand Rapids,*	Eng.
Forrest, Harry Gustavus,	*Manitowoc,*	C. H.
Fortier, Camille Alphonse H.,	*Florence,*	G. S.
Fowler, Roy Edward,	*Wauwatosa,*	G. S.
Frame, Harvey Jay,	*Waukesha,*	C. H.
Freeborne, Simon Arthur,	*Richland Center,*	Eng.
Freeman, Mary Louise,	*Madison,*	M. C.
Gay, Robert James,	*Madison,*	G. S. Sp.
Geilfuss, George Bremer,	*Milwaukee,*	Eng. Sp.
Gibbons, Florence R.,	*Sun Prairie,*	C. H.
Gierhart, Harry Shockley,	*Argyle,*	Eng.
Glenn, Clara Abigail,	*Viroqua,*	Eng.
Goodell, Kate Louise,	*Viroqua,*	M. C.

Gordon, Esther,	*Brodhead,*	G. S.
Gratiot, Leon Pedreauville,	*Shullsburg,*	C. H.
Greenbank, Grace,	*Madison,*	M. C.
Gregg, John Parker,	*Madison,*	M. C.
Griffin, Hattie Josephine,	*Madison,*	M. C.
Grover, Arlene Edna,	*Madison,*	M. C.
Grover, Edna Mary,	*Amherst,*	Eng. Sp.
Gugel, Frank Henry Christopher,	*Madison,*	Eng.
Gunthrop, Pauline Priscilla,	*Austin, Ill.,*	C. H.
Hagemann, Charles Frederick,	*Mauston,*	A. C. Sp.
Hanks, David Arthur,	*Madison,*	M. C.
Hardy, Horace Whitney,	*Grand Rapids, Mich.,*	C. H.
Hart, Katherine Beatrice,	*Madison,*	C. H.
Harvey, Richard Guille,	*Racine,*	A. C. Sp.
Hassell, Editha M.,	*Lancaster,*	M. C. Sp.
Hay, William Henry, Jr.,	*Oshkosh,*	C. H.
Hegg, Clara Ellida,	*Decorah, Ia.,*	Eng. Sp.
Helm, Lougene,	*Baraboo,*	Eng.
Hendricks, Claude Joseph,	*Evansville,*	M. C. Sp.
Hewitt, Morgan Francis,	*Menasha,*	C. H.
Hill, Emily Janet,	*Chicago, Ill.,*	Eng. Sp.
Hirschberg, Joseph Gustave,	*Milwaukee,*	C. H.
Hollister, Ray Asa,	*Oshkosh,*	C. H.
Hopkins, George Allan,	*New York, N. Y.,*	C. H.
Hubbard, Charles Wesley,	*Miller, S. D.,*	C. H.
Hughes, Avis Ethel,	*New Lisbon,*	C. H.
Hughes, William Charles,	*Dodgeville,*	Eng. Sp.
Huntington, Amelia Ecklor,	*Durand,*	Eng.
Huntley, Maude,	*Elroy,*	A. C. Sp.
Ingersoll, Charlotte,	*Beloit,*	M. C.
Irish, James William,	*Baraboo,*	Eng.
Jewett, Maude Ione,	*Sparta,*	M. C.
Joannes, Eugene Charles,	*Green Bay,*	M. C.
Jones, Alvin Bingham,	*Black River Falls,*	C. H.
Jones, Richard Lloyd,	*Chicago, Ill.,*	C. H.
Keech, Bessie Margaret,	*Waupun,*	C. H.
Keefe, Thomas Francis,	*Appleton,*	C. H.
Kelley, Edward Leo,	*Manitowoc,*	C. H.
Kinnaird, Lawrence,	*McGregor, Ia.,*	A. C. Sp.
Knight, Lucile Josephine,	*Beloit, Kans.,*	M. C. Sp.
Krogh, Clarence Alford,	*Mt. Horeb,*	G. S. Sp.
Kronshage, Ernst Hildebrand,	*Boscobel,*	A. C. Sp.
Kunz, Edessa Luella,	*Poynette,*	C. H.
Lamberson, Mabel Zarifa,	*Madison,*	M. C.

Lewis, Albert Miles,	*Omro*,	C. H.
Linde, Clarissa Augusta,	*Oshkosh*,	M. C.
Lindsay, Roy Bernard,	*Whitewater*,	G. S. Sp.
Lipe, Olive,	*Sharon*,	Eng.
Lyons, Clare Beatrice,	*Appleton*,	Eng. Sp.
Main, John Smith,	*Madison*,	A. C.
Manchester, John Darwin,	*Waupaca*,	G. S. Sp.
Markham, Henry Stewart,	*Milwaukee*,	G. S.
Marshall, John Walter,	*West Superior*,	C. H.
Mashek, Anna,	*Kewaunee*,	Eng.
Mason, Max,	*Madison*,	C. H.
Matson, Andrea Rasmina,	*Poynette*,	Eng. Sp.
May, Earl Chapin,	*Rochelle, Ill.*,	G. S. Sp.
McGee, Charles Anson Augustus,	*Milwaukee*,	C. H.
McGlachlin, Thomas Lawrence,	*Stevens Point*,	C. H.
McGregor, Elisabeth Bowman,	*Platteville*,	A. C. Sp.
McKowen, Hattie Estelle,	*North Greenfield*,	Eng.
McMillan, Beatrice Marie,	*Neillsville*,	C. H.
McNair, Grace Elizabeth,	*Brodhead*,	C. H.
Melass, Nellie Josephine,	*Stoughton*,	Eng. Sp.
Merrill, Grace,	*Ashland*,	M. C.
Metcalf, Frank Woodward,	*Dodgeville*,	G. S. Sp.
Michel, Carl Fred,	*La Crosse*,	C. H.
Miller, Augusta Dorothea,	*Green Bay*,	Eng. Sp.
Miller, Howard Clark,	*Whitewater*,	C. H.
Mœssner, Lillie Elda,	*Madison*,	Eng.
Monteith, Jessie,	*Madison*,	M. C. Sp.
Montgomery, Milton Gray,	*Omaha, Neb.*,	C. H.
Moore, William Washburn,	*Glendale*,	Eng. Sp.
Morley, Ralsa Fred,	*Baraboo*,	C. H.
Moses, Howard Nelson,	*Geneseo*,	G. S. Sp.
Muenzner, Richard John,	*West Bend*,	G. S.
Mulrenin, Bernard,	*Sparta*,	C. H.
Munsell, William Andrew,	*Madison*,	C. H.
Murrish, Maud Grace,	*Mazomanie*,	Eng.
Nash, Archie Lyman,	*Manitowoc*,	M. C.
Nelson, George Bliss,	*Amherst*,	C. H.
Nelson, Jessie Louise,	*Sturgeon Bay*,	C. H.
Newell, Maude Berenice,	*Baraboo*,	A. C. Sp.
Newton, Charles McKenzie,	*Bangor*,	A. C.
Norton, Emily Morse,	*Burlington*,	M. C. Sp.
Noyes, Katherine,	*Oshkosh*,	M. C.
Ochsner, Henry William,	*Waumandee*,	G. S.
Oliver, James Frederick,	*Montrose*,	C. H.

Olsen, Minnie Amanda,	*Madison,*	M. C.
O'Neill, Ernest Andrew,	*Neillsville,*	M. C.
Osborne, Theresa T. R.,	*Shullsburg,*	Eng. Sp.
Page, Harlan Kingsbury,	*New York, N. Y.,*	A. C. Sp.
Parkinson, Stanley Barber,	*Madison,*	M. C. Sp.
Patterson, James Roy,	*Madison,*	G. S. Sp.
Patzer, Otto,	*Wausau,*	C. H.
Pearce, Joseph Elmer,	*Lake Linden, Mich.,*	G. S. Sp.
Peck, Porter Caskey,	*Sioux Falls, S. D.,*	C. H.
Pendleton, Genevieve,	*Sioux City, Ia.,*	M. C.
Penniston, Dora Luella,	*Argyle,*	Eng.
Perkins, Frances Gay,	*Fond du Lac,*	M. C.
Perry, Agnes Arlette,	*Woodstock, Ill.,*	Eng.
Peterson, Frederick Burns,	*Madison,*	Eng. Sp.
Pingree, Edith Besse,	*Chicago, Ill.,*	Eng. Sp.
Pinkum, Anna Shaw,	*Eau Claire,*	C. H.
Pollard, Eliza Alwilda,	*Madison,*	M. C. Sp.
Ramage, Joseph A.,	*McGregor, Ia.,*	C. H.
Reber, Anna Catherine,	*Neillsville,*	C. H.
Reedal, George Banks,	*Dekorra,*	G. S. Sp.
Riel, Nellie,	*Burlington,*	M. C. Sp.
Riley, Mabel Victoria,	*Chippewa Falls,*	G. S.
Riordan, Jeremiah Patrick,	*Myra,*	Eng.
Rogers, Seldon Wallace,	*Portage,*	C. H.
Rosenstengel, Hattie,	*Madison,*	Eng.
Royce, Theodore Byron,	*Fort Atkinson,*	C. H.
Ruebhausen, Julia,	*Watertown,*	G. S.
Ryan, Herbert Harry E.,	*Wauwatosa,*	C. H.
Sanborn, Dwight Alexander,	*Milwaukee,*	C. H.
Sauthoff, August,	*Madison,*	G. S.
Schmidt, Edward Alexander,	*West Depere,*	G. S.
Schmidtman, John Christian,	*Manitowoc,*	C. H.
Schreiber, Amelia Maude,	*Madison,*	M. C.
Schumann, Meta Emelie,	*Portage,*	M. C.
Scribner, Annie Nyham,	*La Grange, Ill.,*	A. C.
Secker, Charles Mitchel,	*Baraboo,*	M. C.
Shapiro, Rebecca,	*Medford,*	Eng.
Shearer, Louise,	*Janesville,*	C. H.
Sheldon, Shepard L.,	*Janesville,*	M. C.
Sheldon, Stuart Harris,	*Madison,*	G. S.
Shinnick, Thomas Francis,	*Watertown,*	G. S. Sp.
Shong, Albert Clifton,	*West Superior,*	C. H.
Short, Nathan Green,	*Dodgeville,*	C. H.
Sias, Jessie Josephine,	*Sparta,*	M. C.

Slatter, Frances,	*Sun Prairie,*	G. S. Sp.
Smith, Genevieve Church,	*Madison,*	Eng. Sp.
Smith, Lloyd Dean,	*Amherst,*	Eng.
Smith, Mae Pearl,	*Madison,*	M. C.
Smith, Sidney William,	*Rockford, Ill.,*	Eng. Sp.
Spiegelberg, Fred Fitzgerald,	*Boscobel,*	A. C. Sp.
Spindler, Max Henry,	*Dale,*	G. S.
Sprague, Henry Robinson,	*Verona,*	A. C.
Squire, Charles Albert,	*Sheboygan,*	G. S. Sp.
Stearns, John Burroughs,	*Chicago, Ill.,*	A. C.
Stephenson, Harriet Frances,	*Madison,*	M. C.
Stetson, Emily Merriam,	*Los Gatos, Cal.,*	Eng.
Suhr, Edmund,	*Madison,*	C. H.
Sullivan, Eugene,	*Madison,*	G. S. Sp.
Sutherland, Adda I.,	*Madison,*	Eng. Sp.
Sweeney, David Bernard,	*Howell, Mich.,*	G. S. Sp.
Tallman, George Kemp,	*Janesville,*	C. H.
Thomas, Herbert Henry,	*Darlington,*	C. H.
Tompkins, Lucy S. Estella,	*Madison,*	M. C.
Van Kirk, Frank Walter,	*Janesville,*	G. S.
Van Vorhis, James Harrison,	*Shullsburg,*	G. S. Sp.
Varney, George Andrew,	*Babcock,*	C. H.
Vilas, Elizabeth,	*Madison,*	M. C. Sp.
Vogel, Guido Charles,	*Milwaukee,*	G. S.
Wadsworth, Timothy Benjamin,	*Milwaukee,*	A. C.
Walters, Nellie,	*Oregon,*	Eng. Sp.
Webster, Edward Fairchild,	*Wellington, O.,*	C. H.
Webster, Leverett Francis,	*Wellington, O.,*	C. H.
Weter, James Parsons,	*Depere,*	M. C.
Wheelihan, Nellie,	*Necedah,*	Eng. Sp.
White, Eva Bridges,	*Beatrice, Neb.,*	A. C. Sp.
Wilkinson, Frank,	*Chicago, Ill.,*	G. S. Sp.
Willets, Ray Jesse,	*Milwaukee,*	C. H.
Williams, Charles Ihrie,	*Fox Lake,*	G. S.
Williams, Mabel Margaret,	*Neenah,*	Eng.
Wolfe, Albert Christian,	*Greenville,*	Eng.
Wolff, Albert,	*Racine,*	C. H.
Wood, Augusta Daggy,	*Madison,*	M. C. Sp.
Woy, Maude,	*Madison,*	M. C.
Wright, Christian Ramsay,	*Babaroo,*	M. C.
Young, John Howard,	*Madison,*	C. H.

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ADULT SPECIAL STUDENTS.

Allen, Joseph Henry,	*Madison.*
ApRoberts, Percy,	*River Falls.*
Berg, William Carl,	*Amherst.*
Berryman, Myrtle,	*Mazomanie.*
Blachly, Maude Alma,	*North Freedom.*
Blewett, Dennis Francis,	*El Dorado.*
Bohrer, Rosalia,	*Washburn.*
Crawford, Bertha,	*Madison.*
Crawford, Fannie Matilda,	*Madison.*
Crocker, Levi Archibald,	*Madison.*
Dawson, William,	*Marshall.*
Dunning, Nelson Max,	*Madison.*
Dutcher, Adelaide,	*Madison.*
Eddy, Ernest Wilder,	*Janesville.*
Evans, David J.,	*Cambria.*
Fish, Florence,	*Florence, O.*
Fisher, John Lincoln,	*Janesville.*
Gibbs, Emma Jane,	*Genoa Junction.*
Goddard, Louis Allen,	*Madison.*
Griswold, Edith Margaret,	*Columbus.*
Haagensen, Herman Alfred,	*Madison.*
Hagan, Milo Charles,	*Madison.*
Heffernan, John Joseph,	*Glenmore.*
Hobbins, Louis McLane,	*Madison.*
Howe, Jennie Alida,	*Madison.*
Irish, James W.,	*Madison.*
James, Fannie Louise,	*Delavan.*
Kennedy, Bessie,	*Oshkosh.*
Kimball, Mary Belle,	*Green Bay.*
Lowell, Mary Manchester,	*Waupaca.*
Mathie, John Ferdinand,	*Wausau.*
Moran, John, Jr.,	*De Forest.*
More, Russel Andrew,	*Fountain City.*
Morris, Thomas Sherman,	*Madison.*
Nicodemus, Grace Marie,	*Madison.*
Noyes, Eugene Clement,	*Janesville.*
Petteys, Susie Belle,	*North Freedom.*
Phœnix, Charles Edward,	*Baraboo.*
Radford, Anne Elmsley,	*Oshkosh.*
Reilly, James Patrick,	*Fond du Lac.*
Reilly, Mary Ellen,	*Fond du Lac.*
Richardson, Robert Emmons,	*Wilmot.*
Rogers, Margaret Fuller,	*Milwaukee.*

Rowan, Frank Joseph,	*Oak Creek.*
Sauthoff, Harriet Rosetta,	*Madison.*
Schoenfield, William David,	*Monroe.*
Simpson, John Millard,	*South Osborn.*
Sutherland, Walter Alexander,	*Ashland.*
Thomas, Le Roy,	*West Superior.*
Van Deusen, Walter Suiter,	*Madison.*
Van Dusen, Nellie,	*Madison.*
Virgin, Daisy Dean,	*Fairbury, Ill.*
Warner, Louise Badger,	*Milwaukee.*
Winden, Nora Amanda,	*Madison.*
Wilson, John Frank,	*Sharon.*
Zimmermann, Nell,	*Madison.*
Zollinger, Etta May,	*Waldwick.*

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COLLEGE OF MECHANICS AND ENGINEERING.

Senior Class.

Ahara, George Victor,	*Evansville,*	M. E.
Bertraud, Philip Adolphus,	*West Superior,*	E. E.
Bohan, William James,	*Woodman,*	E. E.
Boorse, Jesse Milton,	*Milwaukee,*	E. E.
Brown, Thane Ross,	*Topeka, Kas.,*	C. E.
Bucey, Jonathan Henry,	*Madison,*	C. E.
Burgess, Charles Frederick,	*Oshkosh,*	E. E.
Burgess, George Heckman,	*Oshkosh,*	C. E.
Cosgrove, James Francis,	*Madison,*	E. E.
Crane, Edgar Willis,	*Riverside, Cal.,*	E. E.
Crenshaw, Thomas Pemberton,	*Richmond, Va.,*	E. E. Sp.
Falconer, Robert Clemens,	*Madison,*	C. E.
Ford, Arthur Hillyer,	*Madison,*	E. E.
Fowle, Harry Herbert,	*Milwaukee,*	E. E.
Frankenfield, Budd Doble,	*Los Angeles, Cal.,*	E. E.
Golder, Lloyd William,	*Rock Falls, Ill.,*	M. E.
Gregerson, Lewis Theodore,	*Stoughton,*	C. E.
Grover Allison Sanford,	*Oak Creek,*	M. E.
Hanson, Walter Sewell,	*Clinton,*	M. E.
Hartwell, Frank Isham,	*Elkhorn,*	M. E.
Kümmel, Carl Henry,	*Milwakuee,*	C. E.
McCulloch, Alfred Langdon,	*Janesville,*	C. E.
Mead, George Alvin,	*Racine,*	E. E.
Meyer, Edward William,	*Milwaukee,*	M. E.
Rendtorff, Edmund Joseph,	*Chicago, Ill.,*	E. E.
Richards, Jere Turner,	*Viroqua,*	C. E.

Schumann, Theodore Paul,	*Prairie du Chien,*	E. E.
Trautman, George Henry,	*Whitewater,*	M. E. Sp.
Vaughn, Frank Arthur,	*Madison,*	E. E.
Warner, Martyn Finch,	*Milwaukee,*	E. E.
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Junior Class.

Bacon, William Thomas,	*Baraboo,*	M. E. Sp.
Barnes, Joseph Porter,	*Rockford, Ill.,*	M. E. Sp.
Bebb, Edward Crosby,	*Rockford, Ill.,*	C. E.
Bennett, Alexander George,	*Mineral Point,*	C. E.
Birkholz, Julius William,	*Milwaukee,*	E. E.
Burkholder, Charles Irvine,	*Sterling, Ill.,*	E. E.
Carlsen, Charles John,	*Janesville,*	M. E.
Conlee, Fred Monroe,	*Oshkosh,*	E. E.
Dickey, Glen Deane,	*Racine,*	E. E.
Dillon, Ellis Ellsworth,	*Normal, Ill.,*	E. E. Sp.
Ela, Edwin Stanton,	*Rochester,*	C. E.
Goddard, Arthur Lawrence,	*Beloit,*	M. E.
Hargrave, Russell William,	*Madison,*	M. E.
Hart, Charles Walter,	*Charles City, Ia.,*	M. E.
Hayden, Charles Beecham,	*Sun Prairie,*	E. E.
Kennedy, William Montgomery,	*Highland,*	C. E.
Lamoreaux, Don Percy,	*Washington, D. C.,*	C. E.
Lemon, Luther Erwin,	*East Plato, Ill.,*	E. E. Sp.
Lloyd, Conrad Collipp,	*Milwaukee,*	E. E.
Maldaner, Arthur,	*Watertown,*	C. E.
Niedermann, Henry John,	*Milwaukee,*	M. E. Sp.
Palmer, Allen Harry,	*Escanaba, Mich.,*	E. E.
Parr, Charles Henry,	*Wyoming,*	M. E.
Perkins, Jay Hugh,	*Madison,*	E. E.
Powrie, William Robert,	*Waukesha,*	M. E. Sp.
Ramien, Carl Henry,	*Milwaukee,*	M. E.
Reedal, Peter Eugene,	*Dekorra,*	E. E.
Robinson, George Porter,	*Milwaukee,*	E. E.
Ross, Harry Harson,	*Columbus,*	E. E.
Ruka, Fred William,	*Boscobel,*	E. E.
Scott, Henry Holton,	*Ashland,*	E. E.
Trippe, Henry Montague,	*Whitewater,*	C. E.
True, Ernest Beede,	*Baraboo,*	E. E.
Van Ness, Leonard George,	*Lodi,*	E. E.
Warner, Fred Dauchy,	*Canaan, N. Y.,*	M. E.
Williams, Charles Henry,	*Baraboo,*	M. E.
Williams, William Henry,	*Madison,*	E. E.
Zimmermann, Oliver Brunner,	*Milwaukee,*	M. E.
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Sophomore Class.

Ahara, Theodore Henry,	*Evansville,*	M. E.
Alexander, Walter,	*Milwaukee,*	M. E. Sp.
Allen, John Samuel,	*Genoa Juncton,*	E. E.
Beebe, Murray Charles,	*Racine,*	E. E.
Bergenthal, Victor William,	*Milwaukee,*	E. E.
Bickley, George Elvin,	*Waterloo, Ia,*	E. E. Sp.
Broenniman, Arnold Emil,	*Watertown,*	C. E.
Brown, Percy Fisher,	*Janesville,*	C. E. Sp.
Clausen, Leon Raymond,	*Fox Lake,*	E. E.
Cockrane, Robert Boyd,	*Antrim, N. H.,*	M. E. Sp.
Comstock, Elting Houghtaling,	*Milwaukee,*	E. E.
Comstock, Nathan,	*Madison,*	M. E.
Coombs, Edward Christopher,	*Madison,*	C. E. Sp.
Cornish, Ross Carlton,	*Oshkosh,*	C. E.
Dixon, Fred,	*New London,*	C. E.
Dutcher, John Edwin,	*Madison,*	E. E. Sp.
Fowle, Arthur Neves,	*Milwaukee,*	E. E.
Fowle, Henry Christian,	*Milwaukee,*	C. E.
Fowle, Irving Horace,	*Milwaukee,*	M. E.
Froding, Charles Lewis,	*Oconomowoc,*	M. E.
Fuldner, Henry Christian,	*Milwaukee,*	C. E.
Hawley, George Prince,	*Madison,*	C. E. Sp.
Hayes, Harry Spoor,	*Milwaukee,*	E. E.
Howe, Leonard Burton,	*Madison,*	M. E.
James, Benjamin Winfield,	*Rhinelander,*	M. E.
Jones, George Harvey,	*Fond du Lac,*	E. E.
Kennedy, Sidney Lawrence,	*New Lisbon,*	C. E. Sp.
Keyser, Charles Frederick,	*Baraboo,*	C. E.
Kiehl, Wallace Phillip,	*Oconomowoc,*	E. E.
Kratsch, William Hermann,	*Milwaukee,*	M. E. Sp.
Kurtz, Charles Means,	*Milwaukee,*	C. E.
Lachmund, Herman,	*Sauk City,*	M. E.
Lademan, Otto Thilo,	*Milwaukee,*	E. E.
Lueth, Emil Samuel,	*Baraboo,*	M. E.
McDonald, Clinton,	*Waupun,*	C. E.
McGregor, Wallace Francis,	*Janesville,*	M. E.
Monahan, John Joseph,	*East Troy,*	C. E.
Nelson, Fred William,	*Ishpeming, Mich.,*	M. E.
Nelson, Oscar Martin,	*Boscobel,*	M. E. Sp.
Olson, August Edward,	*Cambridge,*	E. E.
Owen, Llewellyn,	*Milwaukee,*	E. E.
Patchin, Melvin Taggart,	*New London,*	M. E. Sp.
Petley, Benjamin Henry,	*Milwaukee,*	E. E.

Petley, James Rebbeck,	*Milwaukee,*	C. E.
Reilly, Harry Winne,	*Milwaukee,*	E. E.
Rider, Carlos Bangs,	*Racine,*	E. E.
Rowell, Lewis D.,	*Madison,*	M. E.
Ruger, William, Jr.,	*Janesville,*	E. E. Sp.
Rumsey, Spencer Smith,	*Berlin,*	C. E.
Schildhauer, Edward,	*New Holstein,*	E. E. Sp.
Schmidt, Charles John,	*Milwaukee,*	E. E.
Schneider, Carl,	*Madison,*	M. E.
Schuchardt, Rudolph Frederic,	*Milwaukee,*	E. E.
Short, Frank James,	*Elkhorn,*	E. E.
Snashall, Bert Loyall,	*Evansville,*	M. E.
Solon, James,	*Ridgewood,*	E. E. Sp.
Sovereign, Charles Leslie,	*Rockford, Ill.,*	E. E.
Tilton, Benjamin Elsworth,	*Oshkosh,*	C. E.
Voth, William Benjamin,	*Milwaukee,*	E. E.
Walker, George Parrott,	*Madison,*	M. E.
Webber, Merton Lamont,	*New London,*	C. E. Sp.
Williams, Glenn Herbert,	*Grand Rapids,*	E. E.
Winger, Oscar,	*Grand Rapids,*	M. E.
Wolff, Henry Charles,	*Evansville,*	M. E.
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Freshman Class.

Allen, Eldrith Gordon,	*Oregon,*	M. E. Sp.
Angel, William D.,	*Milwaukee,*	M. E. Sp.
Aston, James,	*Milwaukee,*	E. E.
Austin, Lee Frank,	*Danville,*	E. E. Sp.
Barnes, Everitte Kedzie,	*Chicago, Ill.,*	E. E. Sp.
Barrows, Frederick Shearer,	*Tomah,*	E. E.
Bentley, Fred William,	*Oregon,*	M. E.
Best, Frederick Charles,	*Milwaukee,*	M. E.
Bliss, Orville James,	*Janesville,*	E. E.
Boynton, Clarence William,	*Clark's Mills,*	M. E.
Brand, Clarence Ingram,	*Madison,*	M. E.
Brownell, George Holmer,	*Janesville.*	E. E.
Burr, Arthur James,	*Wasco, Ill.,*	E. E.
Campbell, Bert,	*Evansville,*	C. E.
Chittenden, Thomas George,	*Ripon,*	C. E.
Cole, Ira Lewis,	*Colby,*	C. E.
Crandall, Henry Roy,	*Milwaukee,*	M. E.
Cron, Carlton F.,	*Prairie du Chien,*	M. E.
Darrenougue, Forest August,	*Reedsburg.*	E. E.
DeLay, Cyril Scott,	*Madison,*	C. E.
Elston, Henry Lane,	*Muscoda,*	E. E. Sp.

Farrish, Ray Andrew,	*Grand Rapids,*	M. E.
Foster, Carl Francis,	*Sparta,*	C. E.
Fugina, Arthur Rudolph,	*Fountain City,*	C. E.
Fuller, Chester Wagner,	*Neenah,*	C. E.
Geisse, Walter William,	*Chilton,*	E. E.
Geist, Edwin Stanton,	*Waterloo, Ia.,*	E. E.
Gerlach, Thomas Anton,	*Theresa,*	C. E.
Goldschmidt, Walter Norman,	*Milwaukee,*	E. E.
Gould, Milton Roy,	*Sparta,*	E. E.
Hancock, Edwin Lee,	*Shullsburg,*	E. E. Sp.
Hanks, Marshall Wilfred,	*Madison,*	E. E. Sp.
Harloff, Paul Frederick,	*Madison,*	M. E. Sp.
Heine, Rudolph Ernst,	*Milwaukee,*	E. E.
Hinkley, Earl Langdon,	*Milwaukee,*	E. E.
Hunner, Earl Emmet,	*Madison,*	E. E.
Jackson, Jean Albert,	*Dodges Corners,*	E. E.
Jenne, Robert Daniel,	*Berlin,*	E. E.
Klug, Lebrecht Julius,	*Milwaukee,*	C. E.
Knight, Clark Miles,	*Madison,*	E. E.
Koch, Albert Charles August,	*Milwaukee,*	M. E.
Kremers, John,	*Milwaukee,*	E. E.
Landgraf, Fred Karl,	*Ft. Atkinson,*	M. E.
Leich, Oscar Martin,	*Jackson,*	E. E.
Lueth, Paul Frederick,	*Baraboo,*	M. E.
Macnish, Ralph Benjamin,	*Baraboo,*	M. E.
Main, Royal Cottrell,	*Madison,*	E. E.
Malec, Anton,	*Madison,*	M. E.
McConville, Curran Collins,	*La Crosse,*	M. E.
McNulty, Arthur Loyd,	*Ashland,*	C. E.
Merriam, Hugh Nelson,	*Waupun,*	C. E.
Murley, Hal,	*Shullsburg,*	E. E.
Newell, Martin William,	*New Richmond,*	E. E.
Newell, Thomas Ralph,	*New Richmond,*	E. E. Sp.
Newman, Frederick Jacob,	*Milwaukee,*	E. E.
Olin, William Hamilton,	*Stevens Point,*	E. E. Sp.
Oswald, Frederick Arthur,	*Chicago, Ill.,*	E. E. Sp.
Pope, George William,	*Waupun,*	M. E.
Quentin, Hans Christian Eugene,	*Milwaukee,*	E. E.
Radtke, Albert Augustus,	*Milwaukee,*	E. E.
Raymond, Louis Gilman,	*Peru, Ind.,*	M. E.
Riley, Frank Morris,	*Madison,*	C. E.
Schafer, Otto,	*Muscoda,*	C. E.
Scheiber, Arthur Valentine,	*Milwaukee,*	E. E.
Schneider, Henry Charles,	*Appleton,*	M. E.

Schriber, Carl Edward,	*Oshkosh*,	E. E.
Seymour, Marshall Ehle,	*Beloit*,	M. E.
Shepard, George Van Renselaer,	*Beaver Dam*,	C. E.
Smith, Allard,	*Eau Claire*,	E. E.
Smith, Harry Arthur,	*Brodhead*,	E. E. Sp.
Smith, James Gordon,	*Kansas City, Mo.*,	M. E.
Smith, Philip Sheridan,	*Dodgeville*,	E. E.
Spence, Harry,	*La Crosse*,	E. E.
Street, Lester Chapin,	*Dixon, Ill.*,	C. E.
Swaty, David Youngs,	*Milwaukee*,	E. E.
Thaller, Lawrence John,	*Fountain City*,	C. E.
Thorkelson, Halsten Joseph B.,	*Racine*,	M. E.
Tower, Harry Doolan,	*Milwaukee*,	M. E. Sp.
Tullar, Chester W.,	*Neenah*,	C. E.
Tuttle, Arthur Chaffee,	*Oconomowoc*,	E. E.
Warner, Horace Roy,	*Whitewater*,	M. E.
Wheeler, Clarence Warren,	*La Crosse*,	E. E.
Zabel, Max William,	*Milwaukee*,	E. E.
Zinn, Walter Adolph,	*Milwaukee*,	M. E.

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COLLEGE OF AGRICULTURE.

Long Course.

Bizzelle, Samuel Franklin,	*Tuskegee, Ala.*,	Junior Class.
Dietrich, William,	*Black River Falls*,	Freshman Class.
Greene, Fred Duguid,	*Reading, Penn.*,	Sophomore Class.
Jeffery, Joseph Alexander,	*Madison, Wis.*,	Junior Class.
Rice, Henry Burgett,	*Lewiston, Ill.*,	Junior Class.

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Short Course.

Second Year.

Bennett, Herman James,	*Belvidere, Ill.*
Bixby, John Elon,	*South Haven, Mich.*
Brandt, Louis,	*Johnsonville.*
Butzke, August William,	*Beechwood.*
Butler, George Charles,	*Sussex.*
Davenport, Elmer,	*Auroraville.*
Edgerton, De Witt Clinton,	*Fond du Lac.*
Everson, Frank,	*Lake Mills.*
Greenland, William Henry,	*Sussex.*
Hamlyn, William Winsor,	*West Bend.*
Isom, Albert,	*Madison.*
Jewell, William Frederick,	*Dodgeville.*

Maynard, Hazen White,	*Waukesha.*
Mead, Robert,	*New Lisbon.*
Merrill, Nathan Hull,	*Alma Center.*
Pearsall, Merton Thomas,	*Waterloo.*
Philips, Charles Slawson,	*West Salem.*
Sayles, Arthur Bishop,	*Genesee.*
Stevenson, James Wilson,	*Poynette.*

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First Year.

Ash, Manfred,	*Ripon.*
Baker, Edgar Damon,	*Whitehall, Ill.*
Beaumont, Will,	*Hartland.*
Biddick, Homer Clyde,	*Livingston.*
Blonien, Michel,	*Johnsburg.*
Blumer, Fred,	*Farmers' Grove.*
Bonnell, Alfred Llewellyn,	*Point Bluff.*
Butters, Ernest Eugene,	*Waldo.*
Cowles, Eddie Martin,	*Oakfield.*
Denton, Charles Neff,	*Oconomowoc.*
Dobson, George Edwin,	*Cerro Gordo, Ill.*
Dodge, James Edward,	*Orfordville.*
Douglas, George Elmer,	*Elgin, Ill.*
Downs, George Wallingford,	*Delavan.*
Dowd, Charles,	*Monticello.*
Ellefs, Thomas,	*Montrose.*
Elkinton, William Henry,	*Brownsville.*
Evans, John Edward,	*Berlin.*
Fischer, Rudolph,	*Johnson's Creek.*
Gansel, John Ernest,	*Darrow.*
Ganske, Albert,	*Beaver Dam.*
Gorman, Michael,	*Thorpe.*
Hatz, John George,	*Bangor.*
Haugen, Albert,	*Orfordville.*
Heberlein, Louis Albert,	*Liberty Ridge.*
Helmbolt, Thomas Ellsworth,	*Orfordville.*
Hildemann, Edward John,	*Belle Plaine.*
Howie, David William, Jr.,	*Milwaukee.*
Hood, Charles Philson,	*Shinnston, W. Va.*
Hobart, Burr Eugene,	*Fall River.*
Hughes, Fred Davis,	*Waushara.*
Hurd, Walter Scott,	*Cerro Gordo, Ill.*
Jackson, Theron Joseph,	*Ripon.*
Jenkins, John Protheroe,	*Bangor.*
Jensen, Torwell Adolph,	*Denmark.*

Jensen, Frederick James,	*Waupaca.*
Jewett, Harry Marcus,	*West Salem.*
Jones, Albert Paul,	*Mineral Point.*
Jones, William Harvey,	*Neenah.*
Judd, Leroy Francis,	*Lancaster.*
Karlen, Herman,	*Monticello.*
Kosso, Charles,	*Ahnapee.*
Lawrence, John Sweet,	*Belvidere, Ill.*
Lawrence, George Daunie,	*Petersburg.*
Laub, William Frederick,	*Madison.*
Leuthold, John Henry.	*Iola.*
Lockridge, Albert Cullen,	*Roachdale, Ind.*
Marshall, William,	*Hebron.*
McClintock, Clifton,	*Mindoro.*
McNeil, Henry Augustus,	*Monona, Ia.*
Miller, Fred Robert,	*Madison.*
Morf, John Henry,	*Richfield, Ia.*
Morgan, William Henry,	*Retreat.*
Morton, Lewis Arnold,	*Omro.*
Nicolaus, Charles Albert,	*Troy Center.*
Ovitt, James Samuel,	*Binghamton.*
Ovitt, Norman,	*Binghamton.*
Owen, Grant Edward,	*Portage.*
Parks, Albon,	*Pickett.*
Palmer, Levi Philander,	*Verona.*
Pelton, Alva,	*Dallas.*
Peterson John Scott,	*Denmark.*
Phillips, Francis Nicholas,	*Wyocena.*
Pratt, William Calvin,	*Earlville, Ill.*
Pruden, Robert Lee,	*Marion, Ia.,*
Raisler, Charles Ludwig,	*Bear Creek.*
Reddelien, Carl Bernheart,	*Stone Bank.*
Rittenhouse. Edward Franklin,	*Chicago, Ill.*
Roehrs, Martin Carl Christoph,	*Clinton.*
Shockley, Henry Irving,	*Lamont.*
Steil, George,	*Highland.*
Stratman, Charles,	*West Salem.*
Thoreson, Alfred Byron,	*Holman.*
Walters, Henry,	*Barre Mills.*
Wall, Joseph Elmer,	*Holman,*
Wallace, Paul,	*Fitchburg.*
Weber, Elmer,	*Madison.*
Werth, August,	*Neenah.*
Whitmore, Charles Henry,	*Center.*

Williams, Henry Taylor,	*Waukesha.*	
Wilke, Leander Daniel,	*West Bend.*	
Wilson, William,	*Evansville.*	
Zenz, Andrew,	*Hurricane.*	—83.

Dairy Class.

Alberg, Anthony,	*Neenah.*	
Anderson, Andrew,	*Ridgeway.*	
Anderson, Andrew H.,	*Star Prairie.*	
Anderson, George Edward,	*Towerville.*	
Assmann, Fred William,	*Marshall, Minnesota.*	
Baker, Fred Dow,	*Macedon, New York.*	
Bemis, Frank Marshall,	*Trempealeau.*	
Bentz, Walter George,	*Iron Ridge.*	
Bird, Clint Blair,	*Verona.*	
Bogie, Benjamin Franklin,	*Waupun.*	
Bohren, Albert,	*Orihula.*	
Brownell, Chester Eugene,	*Ellenborough.*	
Brimmer, Otto,	*White Creek.*	
Brunswick, Arnold Walter,	*Newburgh.*	
Bush, Charles Edwin,	*Augusta.*	
Chalupnik, John,	*Sheboygan Falls.*	
Charlier, Ernest,	*Schiller.*	
Cook, Curtis Harold,	*Richland City.*	
Cox, Charles Hallock,	*Waldwick.*	
Dames, Otto Herman,	*Ixonia.*	
Dessloch, Lewis,	*Elkhart Lake.*	
Dooley, Peter,	*Stephensville.*	
Doane, Edgar Willis,	*Louisville, Kasasn.*	
Donner, Henry,	*Richland City.*	
Durkee, Asa Monroe,	*Pulcifer.*	
Esker, Ole,	*Blue Mounds.*	
Flannery, James Stephen,	*Avoca.*	
Fortiner, John Cooper, Jr.,	*Chicago, Ill.*	
Gilbert, Benjamin Palmer,	*Cassville.*	
Gilstad, Nels Christian,	*Clinton.*	
Glass, William Lawrence,	*Beechwood.*	
Grimm, Arnold,	*Clemansville.*	
Guller, Gilbert,	*Smithboro, Ill.*	
Halder, Jacob,	*Paoli.*	
Hauser, Frank,	*Cashton.*	
Harder, Louis,	*Chilton.*	Died March 5, 1895.
Hough, Martin,	*Gilman.*	Died March 9, 1895.
Holzhausen, Herman,	*Reeseburg.*	

Hubbard, Osmond M.,	*Evansville.*
Ihde, William,	*Neenah.*
Johnson, John Burge,	*Clark's Mills.*
Jones, Fred Arthur,	*Brandon.*
Koenig, George,	*Centralia.*
Keopke, Amil,	*Fond du Lac.*
Kolbeck, Frank,	*Whitelaw.*
Kung, Rudolph,	*Monroe.*
Kleine, William Henry,	*Sheboygan.*
Knuppel, Frank,	*Reeseville.*
Krause, Edward,	*Watertown.*
Kuhn, Edward,	*Tustin.*
Lee, John Martin,	*Utica.*
Lean, Philip Roberts,	*Palmyra.*
Lewis, William Theodore,	*New Lisbon.*
Lyon, George Schyler,	*Brandon.*
Main, Louis Leland,	*Albion.*
Matejovitz, Anton Frank,	*Kossuth.*
McKinstry, Harry Carleton,	*Winnebago City, Minn.*
McPherson, James Percy,	*Veefkind.*
Michel, Oscar Ernest,	*Pittsburgh, Penn.*
Mills, Wallace Ray,	*Hortonville.*
Mossholder, Bert D.,	*Minerva, Ohio.*
Mulvey, James Patrick,	*Hingham.*
Nelson, John,	*Kaukauna.*
Nisbet, William,	*Ingersoll, Can.*
O'Brien, Joseph Francis,	*Stephensville.*
Phelps, Stephen D.,	*Briggsville.*
Pierce, William Henry,	*Mineral Point.*
Piek, Joseph Engelbert,	*Thompson.*
Potter, Charles Elmer,	*Cambridge.*
Puls, Henry,	*Louisburg.*
Remington, Frank Earnest,	*Marston.*
Sage, Morris Hesekiah,	*Doniphan, Neb.*
Sampson, George,	*Otsego.*
Schaffner, John,	*Oshkosh.*
Schmidt, William Fred,	*Sturgeon Bay.*
Schmocker, Gottlieb,	*Brownsville.*
Schulze, William,	*Bungert.*
Severin, Johannes Henry,	*New Holstein.*
Silver, Leon Eugene,	*Dayton.*
Simons, Roy,	*Viola.*
Simpson, Sam,	*Arcadia.*
Smith, Mark, Jr.,	*Madison.*

Solvsberg, Martin Martinus,	*Sioux City, Ia.*
Spartz, John Peter,	*Union Grove.*
Stone, William Daniel,	*Wellington, O.*
Strong, Benjamin, Jr.,	*Ripon.*
Teman, Thomas Henry,	*Blue Mounds.*
Thompson, James Edwin,	*Waldwick.*
Tschudy, John Jacob,	*Monroe.*
Trigg, Charlie Malvin,	*Downing.*
Trossen, Hub Nicholas,	*Manitowoc.*
Vipond, John William,	*Shullsburg.*
Vosknil, Anthony,	*Cedar Grove.*
Walvoord, Henry Edward,	*Cedar Grove.*
Washburn, Burton Audy,	*Prairie Farm.*
Waterstreet, William,	*Kewaunee.*
Wells, Willis Charles,	*Neillsville.*
Wittig, Thomas,	*Tarrant.*
Wittner, Gottlieb,	*Monroe.*
Wohld, Jacob,	*Neenah.*
Zumbrunner, Henry,	*Monroe.*

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COLLEGE OF LAW.

Senior Class.

Aarons, Charles Lehman,	*Milwaukee.*
Baker, Norman Louis,	*Kenosha.*
Benfey, Theodore,	*Sheboygan.*
Blatchley, Albert Harlow,	*Princeton.*
Bolzendahl, Ferdinand William,	*Milwaukee.*
Buckheit, Gustave,	*Watertown.*
Bunge, George William,	*Eitzen, Minn.*
Bunn, John Marshall,	*Madison.*
Campbell, Clyde,	*Hudson.*
Carpenter, Frederick James,	*Stevens Point.*
Case, Charles Chester,	*Prairie du Chien.*
Chloupek, Erwin Ladislap,	*Manitowoc.*
Christianson, Robert,	*Ettrick.*
Clark, Harvey,	*Madison.*
Cleveland, Chester Dwight,	*Oshkosh.*
Coffman, Bert,	*Wausau.*
Coghlan, Fred J.,	*Madison.*
Constance, Lewis Llewellyn,	*Waupaca.*
Conway, Dennis D.,	*Grand Rapids.*
Conway, Edward Aloysius,	*Milwaukee.*
Cook, Dayton Eugene,	*Bath, S. D.*
Cook, Willis Clifford,	*Gratiot.*

Dillon, Michael Edward,	*Hammond.*
Doherty, John Francis,	*Baraboo.*
Dudgeon, M. Simpson,	*Madison.*
Elliott, George Theodore,	*Milwaukee.*
Elward, Rodney Abbott,	*Peoria, Ill.*
Emmons, William Marion,	*Waupaca.*
Feeney, Fred Jerome,	*Madison.*
Field, Samuel Martin,	*Racine.*
Foley, John Ernest,	*River Falls.*
Fontaine, Arthur Benjamin,	*Green Bay.*
Foster, Fred Albert,	*Port Washington.*
Fordyce, Elizabeth Helen,	*Phillips.*
Freeman, Henry Warren,	*Chicago, Ill.*
Fugina, Martin Louis,	*Mountain City.*
Goodrick, Arthur Balch,	*Oshkosh.*
Griffin, James Francis,	*East Troy.*
Hanson, David B.,	*Madison.*
Hammond, Ansel Vickery,	*Durand.*
Haven, Spencer,	*Amherst.*
Hartwell, William Gersham,	*Germania.*
Hebberd, Charles,	*La Crosse.*
Heim, Franz Emil Carl,	*Milwaukee.*
Hilbert, Charles Emil,	*Milwaukee.*
Hodges, Gilbert Temet, Jr.,	*Monroe.*
Hopkins, Nelson Sanford,	*Milwaukee.*
Karel, John Colonel,	*Kewaunee.*
Katz, George Henry,	*Milwaukee.*
Kelly, George Thomas,	*Eau Claire.*
King, Thomas Weston,	*Spring Green.*
Kroncke, George,	*Wilmot.*
Larson, Lewis Martin,	*Holmen.*
Lees, Andrew,	*Alma.*
Mahoney, Daniel Oliver,	*Viroqua.*
McClure, Charles Floyd,	*Sparta.*
Meyers, Louis Wescott,	*Lake Mills.*
Nohl, Max William,	*Milwaukee.*
Nugent, Charles H.,	*Jacksonport.*
O'Leary, James,	*Madison.*
Oleson, Oliver,	*Wisner, Neb.*
Orvis, Justin K.,	*Salem.*
Pannier, John Earnest,	*Chippewa Falls.*
Paine, Byron Dixon,	*Madison.*
Parker, Barton Lessey,	*De Pere.*
Pellage, George William,	*Madison.*

Pitkin, Pearly,	*Milwaukee.*
Pollard, Levi Wilbur,	*Linden.*
Reed, Frank De White,	*Madison.*
Reilly, Michael Kiernan,	*Fond du Lac.*
Richmond, Benjamin Franklin,	*Arcadia.*
Rogers, Alfred Thomas,	*Plankinton, S. D.*
Rogers, Charles Britton,	*Fort Atkinson.*
Russel, John Cantwell,	*Thompson.*
Sawyer, Elmer Wilson,	*Hartford.*
Sedgwick, Alexander Kirkwood,	*Houghton, Mich.*
Sheldon, Henry Tillinghast,	*Madison.*
Shimunok, George Thomas,	*Milwaukee.*
Simon, Solomon Russel,	*Milwaukee.*
Smith, Alonzo Roswell,	*Sparta.*
Stevens, Edmund Ray,	*Janesville.*
Swenson, William S ,	*Menominee.*
Thomas, David Darius,	*Barneveld.*
Tierney, Michael,	*Waunakee.*
Waite, Henry Cole,	*Waukesha.*
Walker, Mortimer Eugene,	*Racine.*
Walker, Samuel Thomas,	*Fond du Lac.*
Wartner, Aloys,	*Okee.*
Watrous, William George,	*Madison.*
Wheelihan, Frank Antes,	*Necedah.*
Whitman, Platt,	*Dodgeville.*
Williams, George Edgar,	*Columbus.*
Woolsey, Theodore Dwight,	*Polo, Ill.*

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Junior Class.

Adamson, Charles Albert,	*Eldorado.*
Alexander, Joseph Bullen,	*Eau Claire.*
Allen, William Ware,	*Madison.*
Anderson, Christian Herman,	*Forward.*
Anderson, George Edgar,	*Milwaukee.*
Anderson, William John,	*Milwaukee.*
Angwick, Martin M.,	*Eau Claire.*
Arthur, Frederick William,	*Madison.*
Belland, Amund,	*Viroqua.*
Bird, Hobart Stanley,	*Madison.*
Bischel, Lawrence Joseph,	*Chippewa Falls.*
Booth, Max Gardner,	*Monroe.*
Borchsenius, George Valdemar,	*Baldwin.*
Bowler, Edward R.,	*Sparta.*

Bowler, Timothy M.,	*Sparta.*
Bross, Charles Edmondston,	*Madison.*
Buchanan, Hubert Daniel,	*Rio.*
Buckley, Martin Arthur,	*Black Hawk.*
Bump, Franklin Elisha,	*Wausau.*
Carroll, George Joseph,	*Milwaukee.*
Carroll, William Joseph,	*Milwaukee.*
Casey, John Terance,	*West Superior.*
Chambers, John Ralph,	*Union Grove.*
Clifford, John Melvin,	*Madison.*
Coin, Charles Asa,	*Madison.*
Collins, William Penn,	*Mukwanago.*
Crane, Charles Francis,	*Weyauwega.*
Dahl, Gerhard Melvin,	*Stoughton.*
Dahlman, Louis Anthony,	*Milwaukee.*
Daly, Patrick,	*Reedsburg.*
Dawson, Richard John,	*Tomahawk.*
De Bower, Edward Wallace,	*Dane.*
De Bower, Herbert Francis,	*Dane.*
Dickinson, Harry Fellows,	*Rockford, Ill.*
Dodge, Guy Phelps,	*Madison.*
Dolan, James,	*Platteville.*
Donovan, William Charles,	*Madison.*
Dow, Charles M.,	*Madison.*
Dow, Herbert Ninian,	*Madison.*
Drew, Alva Frank,	*Lodi.*
Drought, James Thomas,	*Milwaukee.*
Edgren, Jesse,	*Madison.*
Egleston, Willis Jones,	*Spring Valley, Minn.*
Ellingsen, Peter Martin,	*Amos.*
Elwell, Percy Spencer,	*La Crosse.*
Erickson, Halford,	*Superior.*
Everett, John Winter,	*Milwaukee.*
Eyerly, Frank David,	*Neillsville.*
Fairchild, David Luce,	*West Superior.*
Falk, Nelson Hadley,	*Stoughton.*
Fish, Percy Titus,	*West Superior.*
Florin, Josias Edwin,	*Menominee.*
Freeman, Charles Fisher,	*Milwaukee.*
Freeman, Charles Nathan,	*Oshkosh.*
Fricke, William A.,	*Milwaukee.*
Gale, George Candee,	*Galesburg, Ill.*
George, Charles Henry,	*Milwaukee.*
Gettle, Lewis Elmer,	*Evansville.*

Green, John Sherman,	*Milwaukee.*
Green, John Verner,	*Madison.*
Grism, Gilbert Cyrus,	*Madison.*
Hagen, Oscar S.,	*Lisbon, Ill.*
Halsey, Pierson Loveridge,	*Milwaukee.*
Hanks, Stanley Charles,	*Madison.*
Hanson, Avery Thomas,	*Milwaukee.*
Hardy, Charles Albert,	*La Crosse.*
Harper, Charles Lewis,	*Lancaster.*
Hart, John Charles,	*Eureka.*
Heineman, Gustavus Nathaniel,	*Wausau.*
Henning, Edward Julius,	*Iron Ridge.*
Heyl, Charles Wendell,	*Madison.*
Higby, Robert Mead,	*Ripon.*
Hill, Junious W.,	*Madison.*
Hoppman, August Charles,	*Madison.*
Huber, Henry Allen,	*Stoughton.*
Husting, Paul Oscar,	*Mayville.*
James, John William,	*Anaconda, Mont.*
Janes, Fred Lincoln,	*Evansville.*
Janssen, John,	*Milwaukee.*
Jefferson, Carl Smith,	*Madison.*
Johnston, Frank Henry,	*Waupun.*
Jones, John T.,	*Dodgeville.*
Karel, Louis Albert,	*Kewaunee.*
Kelsey, Charles Edwin,	*Montello.*
Keysor, Miles Hodgen, Jr.,	*Prairie du Sac.*
Kneckle, Ernst John Rudolph,	*Milwaukee.*
Knoell, Fred John,	*Paynesville.*
Konrad, Nicholas,	*Madison.*
Kull, Fred,	*Lake Geneva.*
Ladd, Nels Albert,	*Madison.*
Lebeis, Henry, Jr.,	*Madison.*
Leisenfeld, Joseph Henry,	*Milwaukee.*
Leitsch, William Charles,	*Columbus.*
Lincoln, Pearl,	*Richland Center.*
Loy. Ardath Waldo,	*Platteville.*
Lukes, Charles Lincoln,	*Racine.*
Major, Jo,	*Eureka, Ill.*
McCabe, Maurice Aloysius,	*Milwaukee.*
McClure, Elmer Perry,	*Assumption, Ill.*
McCully, John,	*Lodi.*
McDonald, John Wasson,	*Burlington.*
Minick, Lewis Charles,	*De Pere.*

Mock, Edward A.,	*Milwaukee.*
Mock, Samuel T.,	*Waukesha.*
Monohan, Nicholas Joseph,	*Wayside.*
Murlless, Arthur George,	*Milwaukee.*
Nelson, John Mand,	*Madison.*
Nelson, Thomas Paine,	*Madison.*
Oaks, John Alb,	*Milwaukee.*
O'Brien, Michael Andrew,	*Shullsburg.*
Onstad Erick John,	*Cambridge.*
Orth, Franklin Frederick,	*Milwaukee.*
Overson, Willard Bela,	*Cambridge.*
Peterson, Isaac,	*Madison.*
Phipps, Cranston George,	*Milwaukee.*
Pickarts, Lucien John,	*Madison.*
Potter, Harry Lee,	*Madison.*
Price, John, Jr.,	*Wonewoc.*
Ramien, Richard Bruno,	*Milwaukee.*
Reed, Carl Webster,	*Cresco, Ia.*
Rice, Edward Martin,	*Morrison.*
Riley, Charles Gilbert,	*Madison.*
Runkel, Louis William,	*Independence.*
Schwefel, Adolph George,	*Lebanon.*
Schildhauer, Henry,	*Neillsville.*
Schlotthauer, Oscar,	*Madison.*
Schmitz, Edward Simon,	*Timothy.*
Sexton, Andrew Reynolds,	*Madison.*
Silverwood, Thomas P.,	*Sumner.*
Smith, Albert Horace,	*Mauston.*
Smith, Fred James,	*Mauston.*
Spenceley, Calvert Frederick,	*Mineral Point.*
Spencer, Frank Hugh,	*Edgerton.*
Spooner, Willett Main,	*Madison.*
Stauffacher, Isaiah Mathias,	*Monroe.*
Suhr, Frederick William,	*Madison.*
Suhr, John,	*Madison.*
Tempke, Arthur Austin,	*New Holstein.*
Tenney, Charles Homer,	*Madison.*
Thomas, William Oliver,	*Milwaukee.*
Torgerson, Andrew Theodore,	*Madison.*
Tucker, Frank Tyler,	*Omro.*
Urquhart, Kenneth James,	*Medford.*
Vandercook, Gilbert E.,	*Madison.*
Vernon, Ralph Charles,	*Madison.*
Walker, Ray D.,	*Lancaster.*

Walsh, Thomas Benjamin,	*Eagle River.*
Wasson, James Thomas,	*Galesburg, Ill.*
Weld, Amos Clarence,	*Rockford, Ill.*
Wilbur, Daniel Webster,	*La Crosse.*
Wilkie, William,	*Platteville.*
Wilkinson, Arthur Cleaver,	*Madison.*
Williams, Thomas Henry,	*Waukesha.*
Woodard, William Henry,	*Watertown.*
Woodward, William Leonard,	*Madison.*
Worden, Lucien Robinson,	*Milwaukee.*
Wyman, Egbert,	*Crandon.*

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Three Years' Course.

First Year.

Bell, Thomas Sloan,	*Milwaukee.*
Buckholtz, George Otto,	*Janesville.*
Cavanaugh, William Edward,	*Princeton.*
Coe, Joseph Spaulding,	*Whitewater.*
Fehr, Jacob, Jr.,	*Milwaukee.*
Frambach, Frank Augustus,	*Kaukauna.*
Hase, William Frederick,	*Milwaukee.*
Heffernan, John Joseph,	*De Pere.*
Hein, William Henry,	*Milwaukee.*
Kaeppel, Victor Edward,	*Milwaukee.*
Kelley, Edward Leo,	*Manitowoc.*
Manson, Herbert Hayes,	*Wausau.*
Mill, Alfred William,	*Kaukauna.*
Powell, Will Anson,	*La Crosse.*
Ruger, William, Jr.,	*Janesville.*
Torbe, Leo,	*Milwaukee.*

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SCHOOL OF PHARMACY.

Four Years' Course.

Barth, George Peter,	*Milwaukee,*	Senior.
Bennett, Lepha May,	*Madison,*	Freshman.
Ferris, William Stewart,	*Whitewater,*	Freshman.
Finney, William H.,	*Clintonville,*	Freshman Sp.
Gage, Florence Meta,	*Madison,*	Freshman.
Iverson, Edward Alvin,	*Chicago, Ill.,*	Junior.
Ladwig, Edwin Robert,	*Milwaukee,*	Junior.
Stephens, Harry Elmo,	*Fennimore,*	Freshman.

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Three Years' Course.

Anderson, Joseph Alvin,	*Argyle,*	Sophomore.
Bilstad, Gunerius,	*Cambridge,*	Junior.
Brewster, Fred,	*Springfield,*	Sophomore.
Ihk, Otto William,	*Ashland,*	Sophomore.
James, Martha Morris,	*Oshkosh,*	Junior.
Jones, Alford J.,	*Iron Mountain,*	Sophomore.
Jones, Laura Miriam,	*Sun Prairie,*	Senior.
Lauterbach, Rudolph J.,	*Gratiot,*	Sophomore.
Melzner, Edward John,	*Ft. Atkinson,*	Sophomore.
Palmer, Fred Everett,	*Sparta,*	Junior.
Peterson, William Matthew,	*Milwaukee,*	Sophomore.
Schempf, John William,	*Watertown,*	Junior.
Schumann, William Robert,	*Prairie du Chien,*	Sophomore.

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Two Years' Course.

Senior Class.

Allen, Louis Henry,	*Genoa Junction.*
Bossingham, Arthur Ernest,	*Oregon.*
Brennan, John Jerome,	*Cato.*
Correll, Washington,	*Cobb.*
Haswell, Edwin Lewis,	*Windsor.*
Miles, Alvah Harry,	*West Salem.*
Nash, Frank Lester,	*Hudson.*

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Junior Class.

Billings, Charles Sumner,	*McGregor, Ia.*
Ellis, Marshall Francis,	*Lancaster.*
Elsner, George,	*Milwaukee.*
Freytag, Ernest F.,	*Milwaukee.*
Holderness, Lester Henry,	*Kenosha.*
Muenich, Frank Conrad Otto,	*Madison.*
Rainey, Charles Francis,	*Arcadia.*
Seaman, Mary Eleanor,	*Kilbourn City.*
Woolston, Alvah Stevens,	*Clinton.*
Zinn, Charles Henry,	*East Troy.*

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WISCONSIN SUMMER SCHOOL.

Students 1894.

Adams, James G.,	*Waterloo,*	Prin., High School.
Allen, L. Kate,	*Berlin,*	Prin., Holland School, Minneapolis.
Amidon, Viola P.,	*West Bend,*	Ass't, High School.
Amy, Alice,	*Baraboo,*	Teacher, First Ward.

Anderson, Anna E.,	*Merrill,*	Prin., High School.
Austin, Ann Cora,	*Fort Howard,*	Ass't, High School.
Behling, Fred,	*Oakwood,*	Teacher, Common School.
Benjamin, Frank E.,	*Paoli,*	Teacher, Grammar Grade.
Bennett, Julia Cora,	*La Crosse,*	Ass't, Minneapolis High School.
Biefeld, Paul,	*Appleton,*	Ass't, High School.
Bird, John P.,	*La Crosse,*	Prin., 3d Dist. School.
Bird, Louise M.,	*Madison,*	Student, Univ. of Wisconsin.
Bohn, Byron L.,	*Wonewoc,*	Prin., High School, Pewaukee.
Bold, Regina R.,	*Bloomingdale,*	Ass't, Madison High School.
Bonfoy, Jennie P.,	*Milwaukee,*	Teacher, Seventh Grade.
Borden, James B.,	*Milton Junction,*	Prin., High School.
Bowman, Frank, F.,	*Madison,*	Student, Univ. of Wis.
Bradford, Mary D.,	*Stevens Point,*	Stevens Point Normal School.
Brainard, Alvin E.,	*Cumberland,*	Prin., High School.
Brown, Mary E.,	*Boscobel,*	Teacher, Grammar School.
Brown, Sarah E.,	*Madison,*	2d Primary, Mazomanie.
Brunn, Alexander,	*Stargard,*	Teacher, Common School.
Buell, Harry C.,	*Lake Geneva,*	Vice Prin., H. S., Janesville.
Carlton, Edward P.,	*Madison,*	Student, Univ. of Wisconsin.
Charnley, Ida F.,	*Marshfield,*	Ass't, Minneapolis H. S.
Christie, Ruth A.,	*Baraboo,*	Ass't Prin., H. S. West Depere.
Clark, Harriet E.,	*Oshkosh,*	Teacher, Oshkosh Normal School.
Cole, Jessie,	*Sheboygan Falls,*	Ass't, High School.
Collins, Mamie R.,	*Prairie du Chien,*	Teacher, Primary Dep't.
Conant, Jennie C.,	*Waupun,*	Ass't, High School, Weyauwega.
Congdon, James W.,	*La Crosse,*	Prin., District School.
Conway, Mary,	*Kilbourn City,*	Ass't, High School.
Corscot, Kate M.,	*Madison.*	
Cowdery, Edith A.,	*Elkhorn,*	Student, Univ. of Wisconsin.
Crocker, Levi A.,	*Tunnel City,*	Student, Univ. of Wisconsin.
Dafoe, George E.,	*Plainfield,*	Prin., High School.
Davis, Sophia E.,	*Winneconne,*	Teacher, District School.
Dignum, Jennie,	*Stevens Point,*	Ass't, Eighth Grade.
Dillon, Augustus R.,	*Chicago, Ill.,*	Prin., Public School.
Ellsworth, Fannie,	*Madison,*	Ass't. Prin., Cumberland H. S.
Emberson, Richard H.,	*Marshall, Mo.,*	Supt., Public Schools.
Fales, Louis H.,	*Madison,*	Student, Univ. of Chicago.
Feeney, Kate H.,	*Madison,*	Teacher, First Grammar School.
Felker, Gertrude,	*Rockford,*	Prof., Rockford College.
Ford, Nellie E.,	*Whitewater,*	Ass't, High School.
Fowlie, William,	*Marshall,*	Prin., High School.
Freehoff, Joseph C.,	*New London,*	Prin., High School.
Fulton, Agnes A.,	*Portage,*	Teacher, Grammar School.

Gallagher, Hugh,	*Cataract*,	Prin., High School, Friendship.
Gault, Etta R.,	*Fond du Lac*,	Prin., H. S., Rosendale.
Giese, Etta M.,	*Madison.*	
Goddard, Louis A.,	*Madison*,	Student, Univ. of Wisconsin.
Gregory, Eva S.,	*La Crosse*,	Teacher, Third Grade.
Green, Abbie A.,	*Basco*,	Teacher, District School.
Hallowes, Clara L.,	*Fort Atkinson*,	Student, Univ. of Wis.
Harder, Herman P.,	*New Holstein*,	Student, Univ. of Wis.
Hatherell, Rosalia A.,	*River Falls*,	Teacher, River Falls Normal.
Hazelton, William W.,	*Blanchardville*,	Prin., High School.
Heald, Lillian B.,	*Madison*,	Ass't, H. S., Two Rivers
Heideman, Lena,	*Waupun*,	Ass't, High School, Sheboygan.
Heinroth, Luella,	*Chicago, Ill.*,	Prin., Grammar School.
Hemmenway, Willard R.,	*La Crosse*,	Prin., High School.
Henderson, Bertina,	*Cambridge*,	Student, Univ. of Wisconsin.
Hesse, Henry D.,	*Milwaukee*,	Prin., District School.
Hicks, Ernest L.,	*Oshkosh*,	Student, Univ. of Wisconsin.
Hill, Charles L.,	*Olivet*,	Teacher, High School.
Hoermann, Rudolph B.,	*Watertown.*	
Hosmer, Charles G.,	*Muscoda*,	Prin., High School.
Hardy, Edward S.,	*Milwaukee*,	Ass't, South Side High School.
Ives, Guy,	*Black Earth*,	Student, Univ. of Wisconsin.
Iwert, Alvin H.,	*Milwaukee*,	Teach., Charles City Coll., Ia.
Jacobs, Etta,	*Boscobel*,	Teacher, Grammar School.
Jackson, Bennett B.,	*Bayfield*,	Prin., High School.
Jamison, Jennie A.,	*Neenah.*	
Johns, Lina May,	*Dodgeville*,	Ass't, High School.
Johnson, Caroline S.,	*Waukesha*,	Teacher, Carroll College.
Jones, Alfred T.,	*Berlin*,	Ass't, High School.
Jones, Margaretta,	*Springwater*,	Teacher, Grammar Grade.
Katzenstein, George,	*Milwaukee*,	Student, Univ. of Wisconsin.
Kaufman, Sarah A.,	*Kilbourn City*,	Teacher, Grammar Grade.
Ketcham, Florence J.,	*Madison.*	
Kimball, Carolyn,	*Janesville*,	Ass't, High School.
Knapp, Luella B.,	*Madison*,	Ass't, H. S., Black River Falls.
Kreiling, August H.,	*Omro*,	Prin., High School.
Kuepper, Julia,	*Milwaukee*,	Teacher, 16th District School.
Langley, William T.,	*West Superior*,	Prin., High School.
Lathe, Harriet L.,	*Elroy*,	Ass't, High School.
Lee, Grace E.,	*Sparta*,	Teacher, High School.
Luetscher, John A.,	*Sauk City*,	Student, Univ. of Wisconsin.
Mann, Hedwig,	*Milwaukee*,	Teacher, Fourth Dist. School.
Mayers, Maggie,	*Madison*,	Prin., Ward School.
McCall, James D.,	*Tuskegee, Ala.*,	Prof., Tuskegee Institute.

McGowan, Frank S.,	*Pewaukee,*	Prin., High School.
McGuire, Agnes J.,	*Merrill,*	Teacher.
McMinn, Amelia,	*Madison,*	Student, Univ. of Wisconsin.
Merk, Helen,	*Sauk City,*	Ass't, High School.
Merk, Josephine,	*Dodgeville,*	Ass't, High School.
Messerschmidt, Jos. E.,	*Madison.*	Prin., High School, De Forest.
Mickelsen, Kate,	*Fort Howard,*	Ass't, High School.
Mueller, Olga,	*La Crosse,*	Ass't, High School.
Munger, Gertrude B.,	*Chicago, Ill.,*	Teacher, Fourth Grade.
Murphy, Jennie G.,	*Boscobel,*	Teacher, Merrill.
Mylroie, Dora M.,	*Dodgeville,*	Teach., First Grammar Grade.
Nelson, Ingebor M.,	*Sturgeon Bay,*	Teacher, Sixth Grade.
Nelson, Thomas P.,	*Madison,*	Student, Univ. of Wisconsin.
Nind, Emmarette R.,	*Chicago, Ill.,*	Teacher, Haven School.
Obenhaus, H. F. A.,	*Prescott,*	Student, Univ. Wis.
O'Connor, Charles J.,	*Madison.*	Prin., H. S., Brandon.
O'Leary, Jessie L.,	*Tomah,*	Ass't, High School, Reedsburg.
Olsen, August J.,	*Belleville,*	Prin., High School.
Olson, Oscar A.,	*Chicago, Ill.,*	Student, Univ. of Wis.
Parlin, Charles C.,	*Brodhead,*	Prin., High School, West Depere.
Paton, Jessie,	*Armada, Mich.,*	Teacher, Lyons, Ill., H. S.
Paulson, Emma,	*Clinton,*	Ass't, High School, Janesville.
Peterson, Charles F.,	*Arcadia,*	Teacher, G. S., Independence.
Philbrook, Charles F.,	*Rochelle, Ill.,*	Superintendent Schools.
Pierce, Frank E.,	*Madison,*	Student, Univ. of Wis.
Pierce, William S.,	*Aurora, Ill.,*	Teacher, High School.
Pollock, James B.,	*Madison,*	Teacher, Orangeville, Ill.
Powers, Nellie G.,	*Ripon,*	Ass't, High School.
Pratt, Minnie,	*Stoughton,*	Ass't, High School.
Reul, Matilda E.,	*Baraboo,*	Ass't, High School.
Robinson, Eliza,	*Bangor,*	Ass't, High School, La Crosse.
Roets, John E.,	*South Milwaukee,*	Prin., High School.
Rygh, George T.,	*University, N. D ,*	Teacher.
Sabin, Kate L.,	*Windsor,*	County Superintendent.
Sabin, Ellen C.,	*Fox Lake,*	Prin., Downer College.
Sanborn, Ellie M.,	*Argyle,*	Ass't, High School, La Crosse.
Schildhauer, Edward,	*New Holstein,*	Student, Univ. of Wis.
Schuster, Clara O.,	*Middleton,*	Ass't, High School, Medford.
Sercombe, Winnifred,	*Milwaukee,*	Ass't, South Side H. S.
Shaw, Edwin,	*Milton,*	Instructor, Milton College.
Sheldon, Frances T.,	*Rockford, Ill.,*	Prof., Rockford College.
Smith, Albert W.,	*Wauwatosa,*	Superintendent of Schools.
Spencer, Anna E.	*Milwaukee,*	Teacher, 1st G., Public School.
Steinmann, Jennie A.,	*Sturgeon Bay,*	Ass't, High School.

Steele, Minnie G.,	*Rochelle, Ill.*,	Teacher, High School.
Steensland, Halbert S.,	*Madison*,	Student, Univ. of Wis.
Steensland, Martin,	*Madison*,	Student, Univ. of Wis.
Tarnutzer, Anna, E.,	*Madison*,	Student, Univ. of Wis.
Taugher, Francis J.,	*Manitowoc*,	Teacher, Dist. No. 5, Liberty.
Thompson, Mary E.,	*Waupun*,	Teacher, Interm., North Ward.
Tilden, Charles S.,	*Elm Grove*,	Student, Univ. of Wis.
Tomkins, Elizabeth M.,	*Milton*,	Ass't, High School, Merrill.
Van Reed, Edith M.,	*Freeport, Ill.*,	Teacher, Grammar Grade.
Varney, George A.,	*Babcock*,	Student, Univ. of Wis.
Vieth, Henry A.,	*Marinette*,	Teach., High School, Middleton.
Walbridge, Fannie R.,	*Madison*,	Student, Univ. of Wis.
Welsh, Mary R.,	*Milwaukee*,	Teacher, Seventh Grade.
Wilder, Mary E.,	*Kenosha*,	Teacher, Kemper Hall.
Williams, George G.,	*West Superior*,	County Supt. of Schools.
Wood, La France W.,	*Augusta*,	Prin., High School.
Zeiniger, Caroline F.,	*Janesville*,	Ass't, High School.

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SUMMARY OF STUDENTS.

GRADUATES—90

Fellows	13
Resident Graduates	43
Graduates studying *in absentia*	34

COLLEGE OF LETTERS AND SCIENCE—785.

Fellows and Graduates	73

Senior Class—124

Ancient Classical Course	13
Modern Classical Course	33
English Course	15
Civic-Historical Course	26
General Science Course	32
Special Students: Eng., 3; C. H., 1; G. S., 1	5

Junior Class—143

Ancient Classical Course	13
Modern Classical Course	20
English Course	15
Civic-Historical Course	43
General Science Course	24
Special Students: A. C., 2; M. C., 10; Eng., 9; G. S., 7	28

Sophomore Class—144

Ancient Classical Course	9
Modern Classical Course	26
English Course	12
Civic-Historical Course	51
General Science Course	10
Special Students: A. C., 1; M. C., 13; Eng., 9; C. H., 3; G. S., 10	36

COLLEGE OF LETTERS AND SCIENCE—continued.

Freshman Class—244

Ancient Classical Course	7
Modern Classical Course	40
English Course	30
Civic-Historical Course	70
General Science Course	24
Special Students: A. C., 12; M. C., 13; Eng., 27; G. S., 21	73
Adult Special Students	57

COLLEGE OF MECHANICS AND ENGINEERING—225

Fellows and Graduates	9

Senior Class—30

Civil Engineering Course	8
Mechanical Engineering Course	6
Electrical Engineering Course	14
Special Students: M. E., 1; E. E., 1	2

Junior Class—38

Civil Engineering Course	7
Mechanical Engineering Course	9
Electrical Engineering Course	16
Special Students: M. E., 4; E. E., 2	6

Sophomore Class—64

Civil Engineering Course	12
Mechanical Engineering Course	16
Electrical Engineering Course	21
Special Students: C. E., 5; M. E., 5; E. E., 5	15

Freshman Class—84

Civil Engineering Course	17
Mechanical Engineering Course	20
Electrical Engineering Course	34
Special Students: M. E., 4; E. E., 9	13

COLLEGE OF AGRICULTURE—213

Graduates		5
Long Course		5
Short Course	Second Year	19
	First Year	83
Dairy Course,		101

COLLEGE OF LAW—266

Senior Class	93
Junior Class	157
Three Years' Course	16

SCHOOL OF PHARMACY—41

Fellows and Graduates		3
Four Years' Course		8
Three Years' Course		13
Two Years' Course	Senior Class	7
	Junior Class	10
TOTAL NUMBER OF STUDENTS		1530
Twice enumerated 10, leaving as actual number		1520

WISCONSIN SUMMER SCHOOL—151.

COLLEGE OF LETTERS AND SCIENCE.

Time-table of Elective Studies that Begin the First Semester.

	M	T	W	T	F	S
Dr. Austin:						
Physics 7	..	9	..	9	..	..
Prof. Barnes:						
Biology 1	3	..	3	..	..	..
Biology 1	..	3	..	3	..	
Prof. Birge:						
Biology 1	3		3	..	..	..
Biology 1	..	3	..	3	..	..
Physiology 4	8	..	8		8	..
Mr. Cheney:						
Morphology of Plants.	9	9	9	9	9	..
Prof. Coffin:						
European History 5	11	11	11	11	11	..
Prof. Daniells:						
Chemistry 1	2	2	2	2	2	..
Prof. Davies:						
Theory of Sound 8	2	..	2	..	2	..
Prof. Ely:						
American Charities 2	2	2	2		..	..
Dist. of Wealth 6	3	3	..	..	..	..
Public Adm'stration 1.	2	2	..	..	2	..
Public Finance 12.	4	4	4	..	..	..
Prof. Frankenburger:						
Philos. of Rhetoric 4	12	..	12	..	12	..
Dramatic Reading 6	..	12	.	12	..	..
Prof. Freeman:						
Eliz. Period 8	10	10	10	10	..	..
Epic; 3	11	11	11	11	..	..
Mr. Giese:						
French 3	10	10	10	10	10	..
French 3	..	11	11	11	11	..
French 3	..	12	12	12	12	..
Prof. Haskins:						
Hist. of Middle Ages 3.	..	..	11	..	11	..
English Const. Hist. 8.	..	12	..	..	12	..
Hist. of Institutions 10.	11	11	..	11	..	..
Prof. Hendrickson:						
Latin 5	8	..	8	..	8	..
Latin 7	..	8	..	8	..	..
Latin Seminary 9	..	..	9	..	9	..
Latin 10	..	12	..	12	..	..
Prof. Hobbs:						
Mineralogy 1	11	11	11	11	11	..
Mineralogy 2	..	12	.	12	..	..
Peterology 3.	8	8	8	8	8	..
Prof. Hubbard:						
Anglo Saxon 1	9	..	9	..	9	..
Beowulf 3	8	..	8	8	..	..
Chaucer 7.	10	..	10	..	10	..
Prof. Jastrow:						
General Psychology 1.	8	8	8	8	8	..
General Psychology 1.	9	9	9	9	9	..
General Psychology 1.	2	2	2	2	2	..
Comp. Psychology 4	10	.	10	..	10	..
Advanced Logic 17	..	10	..	10	..	..
Prof. Kerr:						
Greek 8	..	11	..	11	..	..
Prof. Knowlton:						
Rhetoric 5	..	11	..	11	..	..
Prof. Laird:						
Greek 4	11	..	..	..	11	..
Comp. Philology 2	..	9	..	9	..	..
Sanscript 4	9	..	9	..	..	..
Dr. Miller:						
Vert. Histology 6	9	9	9	9	9	..
Vert. Anatomy 2	11	11	11	11	11	..

	M	T	W	T	F	S
Prof. Olson:						
Beginning Norse 1	12	12		12	12	..
Norse 2	11	11	11	11	11	..
Norse 3	10	.	10		10	..
Icelandic 4	..	10	..	10	..	..
Prof. Owen:						
Advanced French 4	8	8	8	8	8	..
Spanish 1	..	..	..	..	..	..
Prof. Parker:						
Musical Theory 1	..	5	..	5	..	..
Elem'tary Harmony 2.	..	4	..	4	..	..
Advanced Harmony 3.	..	10	10	..	10	..
Prof. Parkinson:						
Elementary Law 1	..	10	..	10	..	..
Const. Law 2		9	..	9	..	..
Am. Const. Law 3	9	..	9	..	9	..
Roman Law 5	10	.	10	..	10	..
Comp. Const. Law 4	..	11	..	11	..	..
Mr. Pyre:						
Survey of Eng. Lit. 6	9	..	9	..	9	..
Survey of Eng. Lit. 6	11	..	11	..	11	..
English Literature 16.	..	12	..	12	..	..
English Literature 18.	10	..	10	..	10	..
Prof. Rosenstengel:						
German 5	9	..	9	..	9	..
German 6	11	..	11	..	11	..
German 20	11	..	..	11	12	..
Mr. Saunderson:						
Elocution 8	12	..	12	..	12	..
Prof. Scott:						
Elements of Pol. Econ.	8	8	8	..	..	..
Money and Banking 3.	9	9	9	..	..	..
Money and Banking 3.	10	10	10	..	..	..
Economics 8	..	12	..	12	..	..
Prof. Slichter:						
Analytic Mechanics 12	11	..	11	..	11	..
Potential Function 13.	..	4	..	4	..	..
Mathematics 18	..	11	..	11	..	..
Dr. Sharp:						
Psychology 1	9	9	9	9	9	..
Psychology 1.	2	2	2	2	2	..
Psychology 1	3	3	3	3	3	..
Prof. Smith:						
Greek 5	11	..	11	..	11	..
Greek Seminary 10	..	..	..	..	..	9
Prof. Snow:						
General Physics 1	..	12	..	12	..	..
General Physics 1	12	..	12	..	..	..
Mr. Sober:						
Latin 4	9	..	9	..	9	..
Latin 10	..	12	12	..	..	..
Prof. Stearns:						
History of Phil. 7	.	8	..	8	..	..
Aesthetics 15	8	..	8	..	8	..
Pedagogy 1	9	9	9	9	9	..
School Supervision 2.	..	10	..	10	..	..
Dr. Thwing:						
Physics 6	9	..	9	..	..	..
Prof. Turner:						
American History 4	..	11	..	11	..	..
Econ. & Soc. U. S His. 7	12	..	12	12	..	..
Con. & Pol. U. S. His. 12	2	..	2	2	..	..
Prof. Van Hise:						
General Geology 1	12	12	12	12	12	..
Prof. Van Velzer:						
Differential Eq's. 8, 9.	10	..	10	..	10	..
Anal. Geometry 11	9	9	9	9	9	..
Modern Algebra 20	..	10	..	10	..	..

COLLEGE OF LETTERS AND SCIENCE.

Time-table of Elective Studies that Begin the Second Semester.

	M	T	W	T	F	S
Prof. Birge:						
Physiology 4	..	8	..	8	..	..
Prof. Coffin:						
Hist. of 19th Century 6.	11	11	11	11	11	..
Prof. Ely:						
Hist. of Economics 7..	2	..	2	..	..	..
Public Adm'stration 2.	2	..	2	..	..	..
Administration 3....	..	..	..	..	2	..
Prof. Freeman:						
Literary Criticism 17..	10	..	10	..	10	..
Eng. Lyric Poetry 14..	11	11	11	11	..	..
Prof. Laird:						
Comp. Philology 1	..	..	..	..	9	..
Prof. Parker:						
Counterpoint 4.....	..	10	10	..	10	..
Prof. Parkinson:						
International Law 6 ..	10	..	10	..	10	..
Mr. Pyre:						
Eighteenth Century, 9.	10	..	10	..	10	..
Prof. Scott:						
Elem'ts of Pol. Econ. 1.	8	8	8	..	..	..
Mr. Bullock:						
Economics 4	8	8	8	..	..	..

	M	T	W	T	F	S
Dr. Sharp:						
Ethics 13.....	10	..	10	..	10	..
Hist. of Philosophy 7..	..	10	..	10	..	..
Prof. Clements:						
Applied Geology 2	12	12	12	12	12	..
Prof. Hubbard:						
Anglo Saxon 2	8	..	8	..	8	..
English Language 4 ..	10	..	10	..	10	..
Prof. Jastrow:						
Ex. Psychology 2.....	9	..	9	..	9	..
Abnormal Psyc'logy 5.	..	2	..	2	..	..
Elementary Logic 16 .	2	..	2	..	2	..
Anthro. Psychology 6.	..	10	..	10	..	..
Prof. Stearns:						
History of Philos 7*a* ..	10	..	10	..	10	..
Aesthetics 15*b*.	8	..	8	..	8	..
Phil. of Education 3 .	9	..	9	..	9	..
Pedagogy 5.....	..	9	..	9	..	..
Pedagogy 6.....	..	10	..	10	..	..
Mr. Sanderson:						
Elocution 12.....	9	..	9	..	9	..
Elocution 11.....	..	11	..	11	..	..

COLLEGE OF LETTERS AND SCIENCE.

Time-table of Required Studies of Freshman Year for 1895-6.

The figures following the subjects refer to the number of the courses. See pp. 74–120.

Hour.	Course.	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.	Saturday.
8 A. M...	C. H	¶Latin.	¶Latin.		¶Latin.	¶Latin.	
9 A. M..	A. C.... C. H... Eng... G. S...	Mathematics, 1, 2, 3 Mathematics, 1, 2, 3 English History, 2. Mathematics, 1, 2, 3	Anc. History, 1. Rhetoric, 2. Eng. History, 2. Mathematics,1,2,3	Mathematics, 1, 2, 3 Mathematics, 1, 2, 3 English History, 2.	Anc. History, 1. Rhetoric, 2. Eng. History, 2. Mathematics,1,2,3	Mathematics, 1, 2, 3 Mathematics, 1, 2, 3 English History, 2. Mathematics, 1, 2, 3	Mathematics,1,2,3 Mathematics,1,2,3
10 A. M.	A. C .. M. C... C. H.. Eng... G. S.	Greek, 5, 6. Latin, 2. Anc. History, 1. German, 1, 2. German, 9.	Greek, 5, 6. Latin, 2. Anc. History, 1. Rhetoric, 2. Rhetoric, 2.	Rhetoric, 2. Anc. History, 1. Anc. History, 1. German, 1, 2. German, 9,	Greek, 5, 6. Latin, 2. Anc. History, 1. German, 1, 2. German, 9.	Greek, 5, 6. Anc. History, 1. Anc. History, 1. Rhetoric, 2. Rhetoric, 2.	Rhetoric, 2. Latin, 2, German, 1, 2. German, 9.
11 A. M.	A. C ... M. C . C. H .. Eng...	Latin, 2. Mathematics, 1, 2, 3 Mathematics, 1, 2, 3	Latin, 2. Mathematics,1,2,3 ¶German, 1, 2.	Rhetoric, 2. ¶German, 1, 2. Mathematics, 1, 2, 3	Latin, 2. Mathematics,1,2,3 Mathematics,1,2,3	Latin, 2. Rhetoric, 2. ¶German, 1, 2.	Mathematics,1,2,3 ¶German, 1, 2. Mathematics,1,2,3
12 M ..	M. C...	German, 3.	German, 3.	German, 3.	German, 3.		
3 P. M..	G. S...	Biology, 1.	Biology, 1.	Biology, 1.	Biology, 1.	Biology, 1.	

Time-table of Required Studies of Sophomore Year for 1895-96.

Hour.	Course.	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.	Saturday.
8 A. M..	Eng....		German, 12.	German, 12.	German, 12.	German, 12.	
9 A. M..	A. C... M. C .. G. H .. G. S...	Ger., 8, or French, 2. French, 1. Rhetoric, 3. French, 3.	Latin, 3. Latin, 3. German, 12. French, 3.	Ger.. 8, or French, 2. French, 1. German, 12. Rhetoric, 3.	Latin, 3. Latin, 3. Rhetoric, 3. French, 3.	Ger., 8. or French, 2. French, 1. German, 12. French, 3.	Ger., 8, or French, 2. French, 1. German, 12. Rhetoric, 3.
10 A. M.	A. C... M. C .. C. H,.. Eng...	Greek, 5, 6. Rhetoric, 3.	Greek, 5, 6. German, 4. French, 1.	Rhetoric, 3. Rhetoric, 3. French, 1.	Greek, 5, 6. German, 4. Rhetoric, 3.	Greek, 5, 6. French, 1.	Rhetoric, 3. Rhetoric, 3. French, 1.
11 A. M.	Eng... G. S...	Eng. Literature, 5. ¶Mathematics, 4, 5.	¶Mathematics, 4, 5. French, 1.	Eng. Literature, 5. ¶Mathematics, 4, 5. French, 1.	¶Mathematics, 4, 5. French, 1.	Eng. Literature, 5. ¶Mathematics, 4, 5. French, 1.	
12 M....	A. C... M. C... C. H... Eng... G. S...	Physics, 2.	Physics, 1. Physics, 1. ‡‡Physics, 1. ‡Physics, 1. ‖German, 10. French, 1.	Physics, 2. French, 1.	Physics, 1. Physics, 1. ‡‡Physics 1. ‡Physics, 1. ‖German, 10. French, 1.	French, 1.	‖German, 10.
2 P. M..	C. H... Eng... G. S...	‡‡Chemistry, 1. ‡Chemistry, 1. ¶Chemistry, 1.	‡‡Chemistry, 1, ‡Chemistrv, 1. ¶Chemistry, 1.	‡‡Chemistry, 1. ‡Chemistry, 1. ¶Chemistry, 1.	‡‡Chemistry, 1. ‡Chemistry, 1. ¶Chemistry, 1.	‡‡Chemistry, 1. ‡Chemistry, 1. ¶Chemistry, 1.	
3 P. M..	C. H... Eng...	‡‡Biology, 1. ‡Biology, 1.	‡‡Biology, 1. ‡Biology, 1.	‡‡Biology, 1. ‡Biology, 1.	‡‡Biology, 1. ‡Biology.	‡‡Biology, 1. ‡Biology, 1.	

¶But one of these two subjects need be taken. ‡‡But one of these three subjects need be taken. ‖Elective.

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