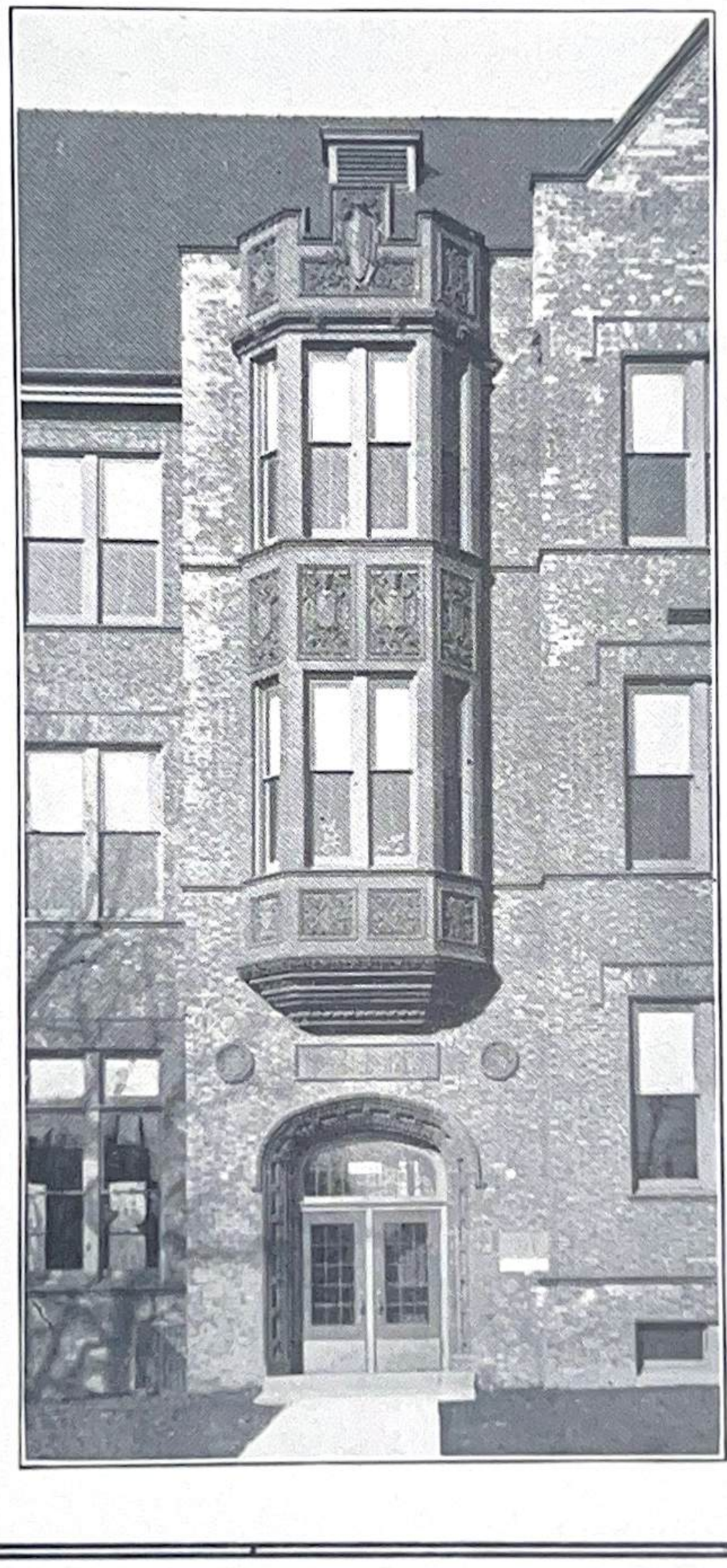
MILWAUKEE-DOWNER COLLEGE



ELLEN C. SABIN SCIENCE HALL

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SCIENCE IN MILWAUKEE-DOWNER COLLEGE

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THE HISTORY AND DEVELOPMENT OF SCIENCE IN MILWAUKEE-DOWNER COLLEGE

Man has investigated the natural forces about him and has informed us of the laws and the generally orderly procedure of these forces. A vast amount of information relating to them has been applied to mechanics, production, health conditions, and has resulted in benefit to all. Science also has supplied a rich cultural background, which alone would justify its place in a college curriculum.

Recognition of its value was acknowledged early by educational institutions. They tried to satisfy the natural honest curiosity of students and to offer them the opportunity to learn the methods whereby the natural laws of the universe had been discovered; to train them to solve new problems; to appreciate the scientific achievements of others; and to stimulate them to take their turn in attacking problems directed towards human betterment.

The history of the development of science at Milwaukee-Downer College has been much the same as elsewhere. It has been parallel with the development of the sciences themselves, unfolding and growing as facilities and new methods permitted. Previous to 1895 both Milwaukee College (founded 1851, Milwaukee), and Downer College (chartered 1855, Fox Lake), offered B. A. or B. L. degrees; each had certain requirements in science for the degrees, and definite years prescribed for the different branches of it. In the earlier years the work in science was largely historical and descriptive. The catalogue of 1889 of Downer College listed all of our present branches of

science and by 1894-1895 it had enough chemical apparatus, dissecting instruments and material for systematic work in biology, to offer a Latin-Science Course.

As far back as 1855 Milwaukee College possessed a "Cabinet of Natural History" and some "philosophical" (physical) apparatus. Mr. I. J. Lapham, President of the Board of Trustees at that time, was a most enthusiastic scientist. By 1872 Milwaukee College had a separate laboratory for chemistry and physics; in 1877 it housed a telescope in its observatory, the former given by Hiram Barber and the latter by William P. McLaren. Other generous friends had added rare ores from Michigan and Wisconsin to the cabinets of geology; a "superb cabinet of models for use by students in Physiology had been imported and presented"; and five cabinets for Natural History were furnished in 1878 by Professor Henry G. Ward of New York.

In 1891 students of Natural Science did work with a microscope, prepared herbaria, and dissected specimens in Physiology. About this time, Mrs. Wade Richardson gave an herbarium collection of 800 specimens to the College.

Shortly after 1895 (Downer and Milwaukee merged in 1895) a Science course replaced the old Latin-Science one; the degree of B. S. was offered; and laboratory work supplemented the textbook study. In 1898 Chemistry was a required course in the Sophomore year with five hours of laboratory and four of recitation each week; "all but the most difficult experiments were performed by each student and a record kept in a notebook." Drawings also were required in Botany, and Biology.

A great impetus was given to the growth of science in 1899 when Merrill Hall was opened. On the third floor it housed Chemistry, Physics, and Biology, each with a laboratory. There was also a lecture room and a museum, but the three subjects were included in the one "Department of Science." Astronomy had its own department and offered a year's course, with the use of the observatory, which met twice a week.

By 1901-1902 a year of Biology or Chemistry was required of all students for graduation. Domestic Science first appeared in the College catalogue at this time. Bacteriology as a laboratory science for one quarter supplemented by Sanitation and General Hygiene for three-quarters was first offered in 1903-1904. For the A. B. degree in 1906 students had to present six credits chosen from some science; in Home Economics eighteen were required and in addition four credits in Psychology.

A stereopticon lantern with microscopic attachment soon increased the equipment, as did also a noteworthy collection of Wisconsin and Mexican antiquities given to the Museum by the Wisconsin Archeological Society.

In 1909 the two branches, Chemistry and Biology, became separate departments. In 1909, because of greater facilities for study and of many new courses introduced, Milwaukee-Downer College conferred the B. S. degree upon students in Home Economics of four years' standing. By 1910 it was possible for a student to elect Chemistry during all four years of her college course.

A gift of paramount importance to Geology was the Thomas Green Memorial Museum in 1913 with a rare collection of 75,000 minerals and 100,000 fossils.

This established a nucleus from which the Department of Geology and Geography developed, thus balancing those of Chemistry and Biology.

Botany and Zoology became separate departments in 1914. Since 1914 requirements for the B. S. degree in science have been frequently increased and many courses introduced have tended toward applied science and vocational training. In 1916 the B. S. degree was extended to the arts with six credits in science required. Occupational Therapy, introduced in 1918, needed certain science courses for background; in 1919 the B. S. degree in Nursing required fifteen credits in science in addition to three in Psychology; special courses in Bacteriology and Chemistry were designed to meet the need of war work in government laboratories.

ELLEN C. SABIN SCIENCE HALL

Science has now reached its greatest opportunity for growth by the opening of the Ellen C. Sabin Science Hall, erected at a cost of $290,000 with additional $35,000 for equipment, and dedicated in 1928. It meets the present demands of a broad training in science and anticipates future development. All the small beginnings have culminated in the great opportunity offered within its laboratories. It is built of reinforced concrete with brick finish, contains large laboratories and classrooms for all sciences (Astronomy has its observatory in Merrill Hall, and Geology, its large collection in Greene Museum). Sabin Hall, a modern fireproof building, consists of five floors. Terraza is the flooring of corridors and some laboratories; of other laboratories it is linoleum or insulite; and of the offices it is wood. Its well-lighted corridors and stairways lead from the basement, with classrooms, and laboratories planned for experimental work

in Psychology to the fourth floor where three animal rooms and several storerooms are located. Laboratories, classroom, offices of the Home Economics Department are on the first floor; Botany and Zoology on the second; Chemistry, Physics, and Geology on the third. Eleanor Pillsbury Hall, a large lecture room in Sabin Hall, accommodating two hundred and forty students, is equipped with a fine desk suited to the demonstration work of all branches of science. At the back of this room there is a raised platform and there are electric connections for lantern and moving picture apparatus. An electrically run elevator carries supplies from basement to top floor; cloak rooms are on every floor. A central power plant furnishes heat, which (piped to the sub-basement), automatically controlled in all rooms by thermostats, regulates the ventilation by the "Heatovent" system. The same central plant supplies artificial lighting for the whole building and power for the refrigerators installed in several laboratories; it also pumps deep well water to all rooms needing it. A supply of city water is also piped to the building. All plumbing is of the modern open type.

THE DEPARTMENT OF ASTRONOMY

General Astronomy

The only course offered in this department is one in descriptive astronomy, extending throughout the year, devoted to a study of the heavenly bodies and their various phenomena. It is designed to give the student some general acquaintance with the universe in which he lives, and does not presuppose a mathematical preparation, though it is open only to students who have completed their freshman year. The work of the course includes classroom lectures, supplementary reading, solution of problems relating to such subjects as the motion of heavenly bodies, eclipses and

time systems, as well as constellation study and observations with the telescope.

The astronomical observatory, located in the northeast tower of Merrill Hall, is equipped with a refracting telescope of five-inch aperture, equatorially mounted, which is available for observations upon the moon, stars and planets. The department also makes use of a celestial globe and other small apparatus.

This brief study of astronomy not only contributes to general culture but is a valuable supplement to the scientific knowledge of a teacher in any branch of science or mathematics, and to the preparation of an observatory assistant.

THE DEPARTMENT OF BOTANY

General Botany
Plant Physiology
Plant Ecology
Bacteriology
Sanitation
Microbiology in Hygiene
Sanitary Science for Occupational Therapy
Teachers' Course in Botany

Courses in Botany are designed to give students the facts of plant structure, of plant activities, their evolution, and their distribution. With such information gained, they are fitted to appreciate plants as **living** things, to care for them in house or garden, and to understand the need of wise choice for artistic effect in park or on an estate. Therefore the work of these courses consists of microscopic and experimental study in the laboratory, and field trips for recognition of the different native local and cultivated introduced species.

Work in Bacteriology is also planned for a better understanding and appreciation of active microscopic plant forms and emphasis in discussion is directed largely to the application of bacteriology to daily life of the individual and to public health and hygiene. Certain laboratory work enables students to get practice in technique for diagnosis of pathogenic forms in city, hospital, or private laboratories.

Work in general botany is carried on in a laboratory for twenty-four students. There are six tables fitted with electric connections for lighting. A demonstration table supplies locker space for microscopes below, and because of gas and water connections above, serves as a desk for experimental work. Some of the common plants needed for laboratory work are grown in a large "germinating table." A dark room (shared with Zoology) offers a space for plant experiments needing this condition.

Another laboratory is partly equipped for other strictly botanical courses. A large desk having gas, electricity, hot and cold water, and vacuum connections offers working space for twelve students and three smaller desks accommodate them at microscopic or other study. The bacteriology laboratory is planned for a group of twenty students only. It has electricity, water, gas, and locker space at each desk. Incubator, sterilizers, refrigerator are placed in this same room for the convenience of all.

Graduates from this department are fitted to teach elementary botany in public schools or to become assistant laboratory technicians. At the present time a half dozen young women are employed in the latter type of activity where they do only bacteriological work or combine it with work in Chemistry.

A CHEMISTRY LABORATORY

THE DEPARTMENT OF CHEMISTRY

General Chemistry
Qualitative Analysis
Quantitative Analysis
Organic Chemistry
Food Analysis
Physiological Chemistry
Teachers' Course

The courses listed above as General Chemistry and Organic Chemistry are both fundamental surveys of two of the large fields into which the science of Chemistry is divided. The former is designed to teach the student the underlying principles of Chemistry and their applications to the composition and behavior of the familiar and useful inorganic substances. The

course in Organic Chemistry gives the student a knowledge of the structure and reactions of the simpler organic compounds, of substances used as food or used in life processes, as well as those used in dyes or having other important industrial applications. These courses are essential to any further work in Chemistry, and are a desirable prerequisite for advanced work in other sciences.

The courses in Qualitative and Quantitative Analysis, as the names suggest, give training in the separation and identification of inorganic substances and in the determination of the composition of various typical compounds. These courses, and also those in Food and Physiological Chemistry, aim to give students thorough training in the standard methods of analysis and in the principles involved, and to teach them to appreciate the value of careful and accurate laboratory work.

The Teachers' Course in Chemistry is designed for those students wishing to teach. It includes a brief survey of the history of Chemistry and of some of the problems connected with chemistry teaching. Practice teaching in the laboratory is required.

The new laboratories and classrooms in Sabin Hall are adequately equipped to meet the needs of the department. The laboratory for the beginning course will accommodate ninety-six students in sections of sixteen students to one instructor. The Organic laboratory is equipped with new desks and will accommodate thirty-six students working in two sections. The analytical laboratory is used the first semester by the Qualitative and Food Chemistry classes, and the second semester by those in Quantitative and Physiological Chemistry, each class meeting on different days. The desks in this laboratory are also new

and are of special construction for quantitative work. Sixteen students in each class can be accommodated here. A side shelf is provided for special electrical equipment used in these courses. An adjoining room is equipped as a weighing room, in order that the sensitive balances may not be affected by the fumes which are always present in a chemical laboratory. Each laboratory is provided with hoods which are ventilated by a powerful fan. Near the three laboratories is a storeroom, which contains a work table where all the reagents can be prepared. In here is also the new electric still and storage tank for distilled water. An office shared by all members of the department and used occasionally by students as a reading room adjoins the storeroom. A classroom for forty students with a special demonstration desk for the instructor is located nearby.

The positions open after graduation to our students majoring in Chemistry are largely laboratory positions. At present there are several recent graduates who are in hospital laboratories or in clinics doing routine analysis. The experience gained is exceedingly valuable, and should lead eventually to positions of greater responsibility, if the student is accurate and conscientious. There are a few openings in public health laboratories for students who have had some post-graduate training or experience.

The best teaching positions in Chemistry for women are in the women's colleges. For these positions advanced degrees and experience are necessary. There are a good many fellowships and part-time assistantships offered in the colleges and universities which enable a capable student to get her master's degree and valuable experience in two years. A graduate of last year holds such a fellowship at Mt. Holyoke College this year, and a student in the present

senior class has been accepted at Wellesley College as a graduate assistant.

THE DEPARTMENT OF GEOLOGY AND GEOGRAPHY

Physiography
Historical Geology
Meteorology and Climatology
Economic Mineralogy
Economic Geography of the United States
Economic and Political Geography of South America
Geography of Europe
Geography of Asia

The Department of Geology came into being in 1913, with the gift of a large collection of fossils and minerals and with the building of a museum on the college campus soon afterwards, to contain it. The collection was made by Mr. T. A. Greene of Milwaukee, and contains a large number of fossils and minerals of exceptionally fine quality. Some of the minerals are used by chemistry students from time to time, and in 1929-1930 a course in Mineralogy will be offered for the first time for students doing their major work in the Department of Geology. These students will have an unusual opportunity in the chance to avail themselves of such material. The collection of fossils was made largely from Wisconsin rocks and consists of many rare and perfect specimens. Well-known geologists have studied parts of it and recognize it as one of the finest in the country.

With the opening of Sabin Hall, Geology and Geography classes have been removed from the Museum to their more commodious new quarters. Classes making use of the collections will still be held in the Museum, however, where there is space and facility for mineralogical work.

The geology laboratory of the new building is equipped with tables designed especially for the department, with tops which may be elevated to the most convenient angle for study of detailed maps. Special lighting is also provided for this work. The laboratory is equipped for the study of rocks and contains casts of prehistoric animals studied in Historical Geology. There is accommodation for twenty-four students.

The courses in Geography are designed to acquaint students with the physical conditions and resources of the continents, and to give them an understanding of people and points of view in different parts of the world.

Students majoring in this department are equipped to teach Geography or Physical Geography in high schools, and many of them find their geography courses a valuable aid for work in history.

THE DEPARTMENT OF HOME ECONOMICS

Foods
Nutrition and Dietetics
Food Survey
Nutrition Readings and Special Problems
History of Food
Diet of Children
Evolution of the Home
House Management
Child Care
Institutional Management
Teachers' Course in Methods of Teaching Home Economics

Home Economics studies have developed along the following four lines: scientific, artistic, economic, and

social. At Milwaukee-Downer we have classified our courses under three headings: (1) Foods and Nutrition; (2) The Home; Its Social and Economic Problems; and (3) Textiles and Clothing. The courses in the fields of food and nutrition and in the social and economic problems of the home have been given in Sabin Hall since it opened in September, while Kimberly Hall, our old Home Economics building, houses the courses in clothing and textiles.

The Home Economics unit is on the first floor, and consists of a Freshman foods laboratory with the unit arrangement of equipment, in which each group of four students has its own work table, range, sink and supply cabinet; also, a large laboratory for nutrition and dietetics classes with the tables arranged in parallel lines and with space at one end for a long table for the laying out and calculating of dietaries. There is a supply room with a frigidaire connecting these laboratories. In addition to these large working centers, there is a group of homemaking rooms, consisting of kitchen, butler's pantry, dining room, and reception room, all of which are an integral and important part of the students' equipment for gaining experience in handling special dietary problems, cooking in large quantities, serving meals, or extending hospitality in a variety of ways. These rooms have been largely furnished and equipped through the generosity of friends of the College. Across the corridor from these units are two offices, and at the end of the corridor is a recitation room. On the floor below is a laundry, and on the fifth floor is an animal room for special nutrition problems.

Students majoring in Home Economics are required to take two years in chemistry, one year in zoology and one semester in bacteriology, and in physics, if it has not been taken in high school. Many take addi-

tional courses in science, and a large number of students majoring in Home Economics have a second major in chemistry. Six courses are offered under the heading Foods and Nutrition: (1) Foods for Freshmen; (2) Nutrition and Dietetics for Juniors; (3) Diet of Children with the nursery school as a laboratory for Seniors; (4) Nutrition Readings for Seniors; (5) a Survey Course in Food Study for students who are not majoring in Home Economics; and (6) History of Food.

Students who are particularly interested in the scientific studies in Home Economics, upon graduation, find positions as dietitians in hospitals, hotels, school lunch rooms and cafeterias; as laboratorians in doctors' offices, research and industrial laboratories, and hospitals. The home service departments of commercial organizations offer increasingly interesting opportunities for girls who can demonstrate, write, lecture, give radio programs, or do experimental laboratory work. The nutrition service of the Red Cross, university extension departments, nutrition clinics, nursery schools, social service, scientific investigations in household equipment and management all need finely trained Home Economics workers with one or more years of previous experience. Teaching still remains for many women the most satisfying avenue of work, and with increased Federal funds for research, extension and vocational work, there is a greater need than ever before for good Home Economics teachers.

THE DEPARTMENT OF PHYSICS

General Experimental Physics.
General Principles of Physics.

The Department of Physics occupies several rooms in Sabin Hall. The laboratory and storeroom are be-

ing equipped. The apparatus is ample for the students now working in the department. Much new apparatus has already been added since the new building has been open, and many accurate experiments have been made possible for the elementary classes. There is a dark room on the same floor for the use of Chemistry and Physics students in photographic work and experiments with light.

Of the two courses at present offered in the department, one is a general course given for the Home Economics students and the other a full elementary course in experimental Physics. The latter is of value to students majoring in the departments of Chemistry and Mathematics. There is prospect of offering further work in this department soon. The laboratory will accommodate twelve students.

THE DEPARTMENT OF PSYCHOLOGY

General Psychology
Child Psychology
Educational Psychology
Social Psychology
Abnormal Psychology

Courses in Psychology are of benefit to the student who is planning to do any kind of work wherein a knowledge of human nature is required. Prospective teachers, and workers in Occupational Therapy, must take a certain amount of Psychology in order to meet professional requirements.

General Psychology is a foundation course, introducing the student to a scientific conception and interpretation of human activity and thought. Child Psychology is designed to give an understanding of the development of the human mind. It is both a

cultural and a professional course. Child observation adds great value to classroom discussion and outside reading. Educational Psychology is required of all students expecting to teach. It shows the various ways in which the principles of General Psychology can be applied to the field of education. Laboratory work supplements classroom discussion and outside reading.

Social Psychology deals with man in his social environment. This course relates the field of Psychology proper to the field of Sociology and is of especial importance to those who are interested in any form of social work. Of great value also to Occupational Therapy students and to those interested in social work is the course in Abnormal Psychology; for it introduces the student to the study of various types of abnormal mental phenomena, with emphasis upon their relation to normal mental life.

The Psychology lecture room is located on the first floor of Sabin Hall. The instructor's desk, on an elevated platform, is well planned to give demonstration experiments. Fifty students can be seated comfortably in this room. On the ground floor of Sabin Hall are located the main laboratory, smaller individual ones, and the audition room. The main laboratory, equipped with twelve desks, accommodates twenty-four students in a section. Large book-cases and enclosed shelves for apparatus are found in this room, as well as in the individual rooms.

A ZOOLOGY LABORATORY

THE DEPARTMENT OF ZOOLOGY

General Zoology
Comparative Anatomy of Vertebrates
Physiology
Genetics
Embryology
Histology
Ornithology
Elementary Hygiene

The Zoological Laboratories in Sabin Hall have been planned so as to permit as wide an adaptation in their use as possible that future needs as well as present ones may be adequately met. Certain fundamental requirements for the study of animals as living things, such as plenty of light, fresh air, temperature

regulation and an abundance of running water have been provided in three large laboratories with supplementary rooms consisting of special animal rooms, storerooms, preparation rooms, dark room, office and classroom. Most of the furniture for these rooms including work tables, aquarium tables, lockers, specimen and apparatus cases, and sinks has been installed. All are completely piped and wired. In addition to the city tap water, well water is supplied to the aquarium tables in the vivarium and physiological laboratories and to the large frog tank in the basement, thus insuring favorable conditions for maintaining the many living forms necessary for study in connection with the various courses.

The courses given in the department are organized with three classes of students in view; general students who are concerned primarily with the cultural side of the subject; special students who choose Zoology as the field of their major interest; and students who wish to enter the applied fields of Home Economics, Physical Education, Occupational Therapy, Nursing, or Medicine, and who need work in Zoology as a part of their preliminary training.

Probably the most vital function of the study of Zoology is to give all of its students that broad acquaintance with living things which will lead to a deeper understanding of their own place in nature. The dominating biological note in much of the recent literature shows how important are the facts of Zoology to straight philosophical thinking. The subject has, however, a more obvious personal and practical side in its application to healthful living. All of these aspects are stressed in the introductory course which is planned for all three groups of students.

The other courses contribute naturally to the same ends but each has its own specialized function. The more advanced courses in vertebrate anatomy and physiology are useful to students of Occupational Therapy and Dietetics. These courses with Histology and Embryology in addition are also valuable prerequisites to the study of either Nursing or Medicine, the hospital training of the prospective nurse being shortened by such preliminary work in College. The microscopical technique which is a part of the work of many laboratory technicians and research assistants is given in connection with the courses in Histology and Embryology. Genetics, dealing as it does with human heredity, has an important place in the preparation of social service workers.

Most of the positions open to students of Zoology require some graduate study and experience. This, in the case of capable students, can usually be had through the graduate scholarships and assistantships offered by the departments of Zoology of the larger universities and colleges. With this preparation the student is fitted for the more responsible and more remunerative teaching or research positions.

GENERAL FACILITIES

Besides the science laboratories and the College Library, which has 2,600 volumes of pure and applied science and about 35 current scientific periodicals, Milwaukee itself furnishes many opportunities for study. City parks, the Conservatory of Mitchell Park and the Zoo of Washington Park, the Public Museum itself and its loan collections, are all a great aid. The shelves of scientific books and papers of the Milwaukee Public Library are available to both students and faculty, as are also the valuable journals of the Milwaukee County Medical Society.

INTEREST IN SCIENCE

Enthusiastic students of all branches of science have had an organized Science Club for many years. They outline and conduct the programs of its monthly meetings. Frequently, guests from outside lecture before the group and some evenings are of an entirely social nature.

From time to time students and alumnae have added valuable gifts to the departments of science. Most generously also have trustees and friends contributed toward the erection and equipment of Sabin Hall.

DEGREES

At the present time the College requires 120 credits for all degrees. For the degree of B. S., 30 credits must be offered in Science (which may include Mathematics) twenty in one and ten in another, provided one year of Physics is offered for entrance to College; if Physics is not offered for entrance, 36 credits,—twenty in one science and sixteen in other sciences including six in Physics.

Within the last few years twenty or more of our Alumnae, who made science their major in College, have done graduate work at universities or other colleges and have obtained their Master's degree in Science. Usually this work has been done in one year, but some with scholarship duties have taken two years for it.