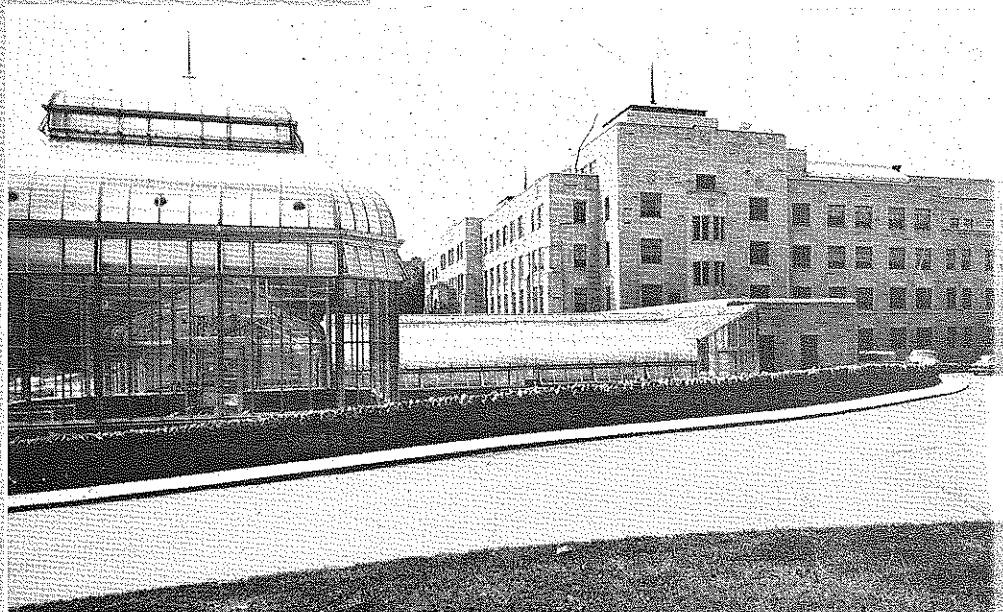


INDIANA UNIVERSITY



Jordan Hall of Biology

THE
DEPARTMENTS OF
Bacteriology
Botany
Zoology



A CLASS IN THE AUDITORIUM, WITH PROFESSOR T. W. TORREY, ZOOLOGY, LECTURING.

LIBRARY READING ROOM.



Jordan Hall of Biology

Jordan Hall of Biology, named in honor of David Starr Jordan, former Professor of Natural History and President of Indiana University, brings under one roof the various activities of the Departments of Bacteriology, Botany, and Zoology, which until recently have been scattered among several different buildings. For the first time in many years, biological teaching and research can be carried on under conditions which permit co-operative, efficient utilization of common facilities, and which afford the advantage of daily contact between members of the several departments.

Built of Indiana limestone, Jordan Hall cost, with its equipment, \$5,750,000. The frame is of reinforced concrete faced with Indiana limestone. In the five and one half floors there are more than 207,000 sq. ft. Every effort has been made to impart flexibility, and to provide quiet, efficient, and easily maintained quarters. Wherever possible the partitions are so constructed that they can be easily moved. Many of them are steel and most of the remainder are constructed of Haydite block lined completely on the lower half with semi-glazed tile. The corridors and some of the rooms are completely walled with tile. Both the tile and the steel panels provide a permanent finish which eliminates much of the maintenance inherent in painted walls. Ceilings in both rooms and corridors are acoustically treated. Floors are of concrete covered with asphalt tile in most cases. Fluorescent lighting is used throughout. Despite low ceilings, the rooms are light, well-ventilated, and quiet; all air is humidity-, temperature-, and dust-controlled. A variety of color schemes and the natural birch or oak furniture add to the attractiveness of the building.

The principal entrance opens into a foyer trimmed in natural oak paneling and plaster. This area can be locked off from the remainder of the building permitting entrance to the library, the faculty lounge, or the auditorium without exposing the laboratory areas. The main auditorium seats 350 in amphitheater style and is equipped with all necessary services. The chalkboards can be raised or lowered by push-button controls and lights may be dimmed to any degree by a control at the speaker's table. This table is provided with the usual laboratory services and, in addition, a public address system and signal to the projection booth. There are also four smaller lecture rooms, seating from 50 to 150.

The library, which opens off the foyer, seats ninety-six in its spacious reading room and has stack space for 75,000 volumes. Over 600 journals are currently received. There are a number of carrels for students and staff and reading rooms associated with the reprint collection. Adjacent to the library is a graduate student lounge furnished with comfortable modern furniture and across the foyer from the library is a faculty lounge also attractively furnished and equipped with a kitchenette to enable serving refreshments after seminars and similar gatherings.

Services provided throughout the building are hot, cold, and distilled water, gas, electricity (110 v. and 220 v.), compressed air, and steam. Hot water faucets are supplied with softened water and deionized water is available from the units which service the greenhouses. The building is served by two spacious elevators.

Bacteriology

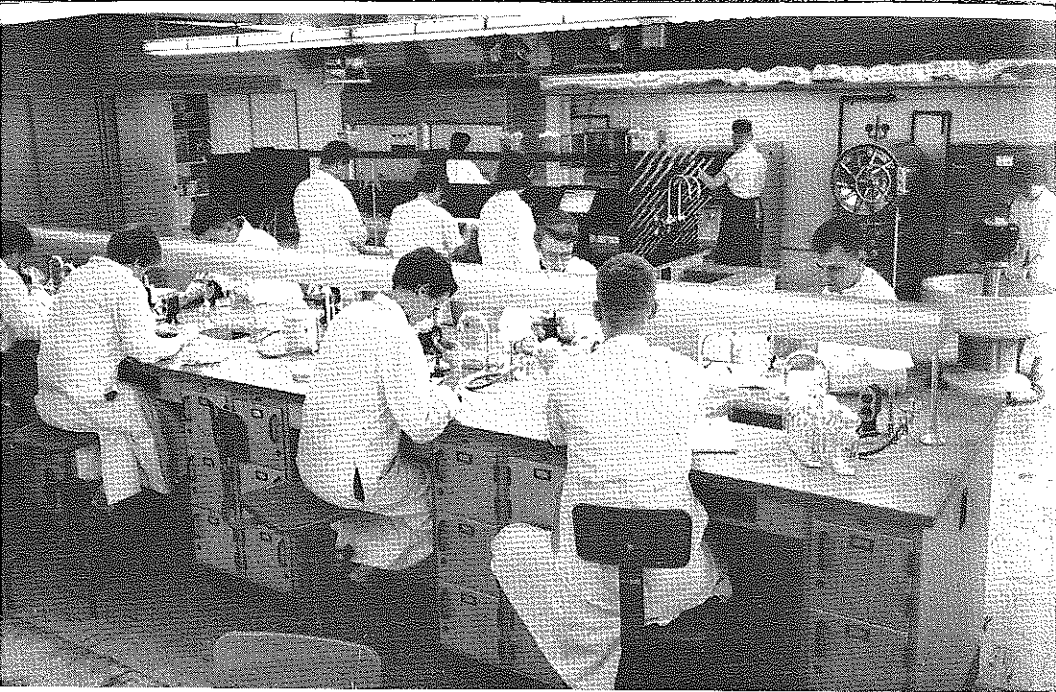
The area for bacteriology is located primarily on the fourth floor and the east wing of the third floor. On the fourth floor, two class laboratories are separated by, and commonly served by, three walk-in constant temperature rooms (25°, 30°, and 37°C) for incubation of experimental cultures. Two of these rooms are provided with light cabinets for growth of photosynthetic bacteria. In each of these laboratories the student-tables with soap stone tops are 37 inches high and each student has an easily adjustable laboratory stool with back and foot rests. Six lockers and one book space are provided at each station as is water, gas, and 110 volt AC electricity. The student tables are equipped with a fluorescent light fixture, so mounted that ideal illumination is available for the microscope and other procedures requiring critical lighting. The level of the fixture is sufficiently low that the student has an unobstructed view of the instructor's desk which is used for demonstrations and as the storage cabinet for student microscopes. A specially designed "discard truck" receives the used glassware from these laboratories and from all research rooms.

Both of these laboratories may be darkened for daytime slide projection or for experimental work. Each room is equipped with emergency fire showers, titration bench, chemical hoods, distilled water, storage cabinets, and two circular 54-inch sinks for hand washing. The elementary laboratory has forty-two student stations. The available work area for each student is slightly larger in the advanced laboratory which has thirty-two stations. In addition, this room is provided with a chemical bench, hot air and steam sterilizers, and incubators for temperatures not available in the walk-in rooms.

A third teaching laboratory is designed for sixteen students and is used primarily for graduate or other advanced classes requiring considerable specialized equipment. The center of the room is provided with floor-level electrical outlets to permit special equipment to be moved to the arca as needed. A feature of this laboratory is a conference table to permit small group discussions and calculation of experimental data.

Each faculty member is provided with a private office and an adjoining research laboratory. A second laboratory is adjacent or near the faculty laboratory to provide space for graduate students or research project personnel. Although the exact layout of the research laboratories varies with the room size, location, and intended use, the majority are provided with the following: chemical bench, equipment table, bench for microscopic or other work in which the investigator is seated, emergency fire shower, wall cabinets, atmospheric pressure steam sterilizer, and an inoculation cubicle with ultraviolet light for air sterilization. Study desks are included in the research laboratories for graduate students.

Three adjacent rooms, each with terrazzo tile floor, make up the important service unit of storeroom, principal media preparation room, and glassware washing and sterilization room. The storeroom contains a number of dust-free wood cabinets with adjustable shelves for storage of precision glassware, chemicals, minor items of apparatus, etc. Additional storage area is available on the basement floor as is also a receiving room. The principal media preparation room, staffed by full-time personnel, is used for the production of media and other supplies for the classroom laboratories and certain items for the research programs. The room contains recessed autoclaves, an atmospheric pressure sterilizer, and a 10



A TEACHING LABORATORY IN BACTERIOLOGY.

gal. steam kettle for large batches of culture media. An inoculation cubicle is available.

In the glassware room large and small recessed autoclaves are available for the sterilization of used glassware prior to washing. Following sterilization the trays of glassware are removed to large trucks and sorted at an L-shaped sink-table at convenient height. The glassware is washed in a specially built hot water-jet washer. The clean glassware is placed in forced hot air dryers for rapid drying before being packaged for hot air sterilizers. Recessed electric hot air ovens are used for dry heat sterilization. The glassware room also contains a small double sink and a large deep sink with the latter being used for carbons and other large items. All sinks, drainboards, and shelving in this area are of stainless steel and the sinks are provided with knee-controlled drains. An acid cleaning bath for pipettes and other glassware is fabricated entirely of heavy lead.

The furnishings of the seminar-conference room, adjacent to the departmental office, include a twelve-foot conference table (six feet wide at one end and three feet wide at the other) and matching chairs of softone oak. In addition, a number of comfortable folding chairs are housed, when not in use, in an attractive wood cabinet in the room. The room is equipped with darkening shades and a permanent screen.

Adjacent to the animal quarters for zoology, on the west wing of the fourth floor, the bacteriology unit consists of several rooms some of which are individually air conditioned. Two of the rooms have doors to outside runways to permit, if needed, exercise of experimental animals. An alarm system indicates temperature fluctuations of more than 2°C from a predetermined level. Throughout this area the tile walls and terrazzo floors with drains permit frequent washing. No effort has been spared to provide animal quarters of the most modern design to

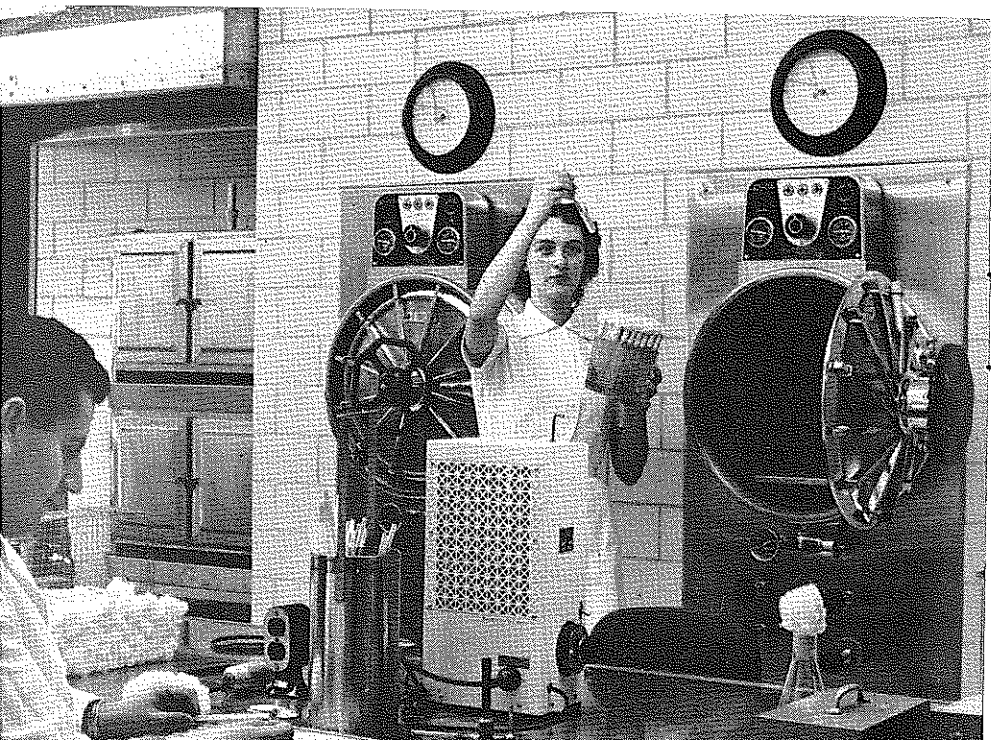
permit the animals to be housed in sanitary quarters.

In addition to the research laboratories mentioned above, additional rooms have been provided for special purposes. These include laboratories for radioactive chemical work, a laboratory (basement level) for sensitive apparatus requiring vibration-free supports, special instrument room, darkrooms, and a laboratory for tissue cultures. In addition, two rooms contain hot air and steam sterilizers, ice flake machine, continuous flow centrifuge, and other special equipment for use by graduate students and research personnel. There are also two walk-in refrigerators, a deep-freeze (-20°C) room, and a small cold ($+2^{\circ}\text{C}$) laboratory with chemical bench.

The greenhouse for the Department is located on the roof of the west wing and is used for plant virus and other plant studies.

It should be obvious from the above description of the facilities in the Department of Bacteriology that provision has been made for fundamental research on a wide variety of problems. In addition to the built-in equipment there are available several units of special research equipment necessary for modern investigations. The present research program of the Department emphasizes such areas as physiology, metabolism and taxonomy of bacteria, mode of action of antibiotic agents, and the biology and biochemistry of the bacterial viruses.

BACTERIOLOGY MEDIA PREPARATION ROOM.



Botany

The Department of Botany is situated in the east half of the building, occupying most of the basement, first and second floors, and part of the third floor. It also occupies the east pent-house area and has extensive greenhouses on the roof. Attached to the east end of the building is a large "headhouse" wing, from which the ground level greenhouses extend. The headhouse wing includes a finished basement level and the area under the greenhouses, though unfinished, is excavated to serve for storage or future expansion.

In the building proper, the Department has a seminar room, seven teaching laboratories, and two central research laboratories for graduate students. Each of the teaching laboratories has been specifically designed and equipped for a group of related courses. Each has an adjacent preparation room with ample storage space and facilities for preparing materials used in the classroom. In addition, there are strategically placed media kitchens, balance rooms, and transfer rooms. Insofar as possible, related subject areas have been grouped into units which lie close together and close to the appropriate service areas.

At the basement level are two teaching laboratories designed primarily for elementary work including nature study and horticulture. These are close to the ground-level greenhouses and to the auditorium. At this level, besides extensive stockroom and storage facilities and a dishwashing room, the Department has metal and wood-working shops, a glassblowing room, a fully equipped X-ray room, and space for an electron microscope with accessories, all of which are available to all departments. There is also a special radiobiology laboratory to which is appended a series of "caves" for the storage of radioactive materials.

The counter room and balance room for radiobiological work are located in the basement of the headhouse wing. This wing also includes, besides a storage space and work room, a series of four large rooms which are to be developed as plant culture areas with controlled light, temperature, and humidity.

Near the greenhouses on the first floor of the main building are grouped laboratories assigned to plant physiology. These include a teaching laboratory, graduate research laboratories, preparation room, balance room, and transfer room. All are equipped with stone-topped chemical benches and ample hood space.

On the same floor are the facilities for taxonomy which include a teaching laboratory, an herbarium, and associated work room. The herbarium is of library stack construction in three levels and has a capacity of 250,000 specimens. It houses among other collections the Deam Herbarium, which is the most complete collection in existence of the plants of a single state. The departmental office is also on the first floor.

Teaching laboratories on the second floor are devoted to courses dealing with algae and fungi, and the research facilities required for work with these groups are also in this area. Included in this unit are a media kitchen, two preparation rooms, and several transfer rooms. Two of the constant temperature rooms nearby have been provided with special illumination and humidity controls necessary for the maintenance of the algae culture collection. This collection now includes over 650 strains in uni-algal culture and is the largest such collection in the country.

On the third floor the Department has two laboratories used for courses in cytology, morphology, anatomy, micro-technique, and paleobotany. The similar



BOTANY GREENHOUSE AREA.

facilities demanded by these courses and the allied research programs are centralized in the embedding room and sectioning room which lie between the two laboratories. Special saws and laps required for work in palcobotany as well as storage cases for the collection of finished specimens are located in the basement.

The greenhouses, half of which are at ground level, half on the roof, cover an area of 13,689 sq. ft. They are of aluminum construction and are equipped with automatic heat and ventilator controls. Tap water is available for cleaning operations, deionized water for watering the plants. A recirculating watercooling system provides a curtain of softened water over the glass during the summer. Preliminary tests indicate that the water absorbs sufficient infrared radiation to lower the inside temperature by about 10° F. on a hot day. The ground greenhouses, which include a large palm house, are designed primarily for teaching pur-

poses, those on the roof for research programs. The first floor of the headhouse wing contains work and storage areas for greenhouse operations, an office for the greenhouse manager, and a combined museum and workroom for students in horticulture and nature study. This unit is connected by a dumb-waiter to another room on the roof level for greenhouse work and storage. A small chemistry laboratory in the penthouse is allocated for use in connection with the greenhouse.

Associated with the various specialized areas, the Department has fifteen constant temperature rooms capable of operating in overlapping temperature ranges. Several of these also have humidity controls. Three darkrooms are available for photographic work, each equipped with stainless steel sinks and devices for maintaining constant regulated temperature of the water supply. There are offices for about twenty-five graduate students, a visiting professor's laboratory, and eight faculty suites, each con-

sisting of an office and private research laboratory fully equipped with the various services.

In the facilities provided, the Department offers instruction and carries on research in the following fields: anatomy, morphology and paleobotany, taxonomy and biosystematics, cellular and plant physiology, radiobiology, mycology, phycology, agrastology, cytology, and cytogenetics. Instruction is also offered in biology, horticulture, nature study, and economic botany.

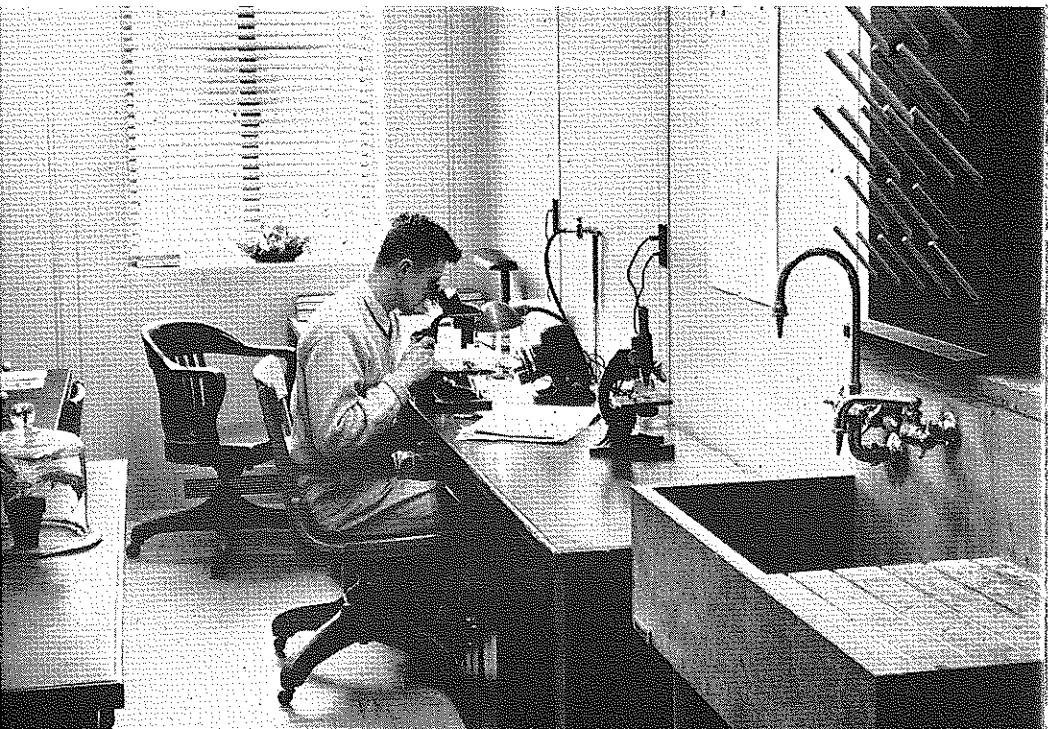
Zoology

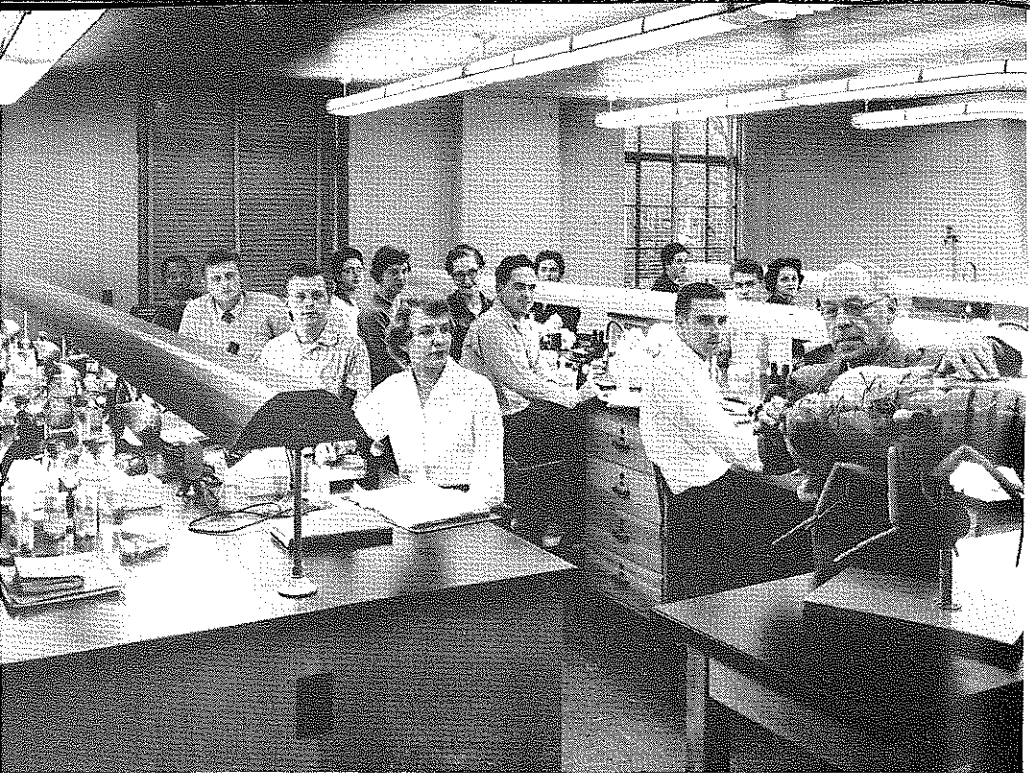
The Department of Zoology occupies the west wing and part of the central region of Jordan Hall. The distribution of this space is shown on the floor plans

of the building. As the Department emphasizes both teaching and research, the rooms and equipment have been planned accordingly.

For teaching purposes, there are ten laboratories, five for the use of elementary classes and five for students on more advanced levels. Three of the elementary laboratories are in the basement and two on the first floor. They are placed on these lower levels for the convenience of the large number of students who come and go and to lessen the disturbances to research activities and advanced classes on the upper floors. Each of these elementary laboratories accommodates forty students and has an adjoining stock and service room. All are provided with light-proof shades and projection screens and are equipped with all necessary lockers, storage and exhibit cases, and sinks. Two of the advanced

A TYPICAL LABORATORY AND STUDY ROOM FOR GRADUATE STUDENTS.





PROFESSOR MULLER, ZOOLOGY, LECTURING IN A GRADUATE LABORATORY IN GENETICS.

laboratories are on the first floor, one on the second, and two on the third floor. Four of the five are equipped to care for twenty-four students, the fifth for sixteen students. These laboratories feature furniture and equipment designed to serve the special needs of particular courses.

The research activities of the Department fall into several distinct categories. Rather than enumerate the details of rooms and general equipment, attention is drawn to the major areas in which research is now in progress and to the over-all space and special equipment available.

Ecology-Limnology. This area includes studies of lakes and streams, their history, their physical and chemical characteristics, and the productivity of the animals and plants that live therein. Equipment

for research in this area consists of an aquarium room with tanks and batteries of small aquaria, running water, aeration and dechlorination facilities, and a chemical laboratory for water chemistry. In a museum room is a working collection of Indiana fishes, and a large reference collection of reprints is available. The Biological Station, Winona Lake, Indiana, offers opportunities for both field and laboratory work in summer. Reports of research in the area appear as occasional volumes under the title, *Investigations of Indiana Lakes and Streams*. Laboratories and offices are in the basement and on the first floor.

Embryology. Research in embryology centers primarily about the experimental and biochemical approaches. Special equipment available consists of an ultracentrifuge, a refrigerated centrifuge, plus

ovens, incubators, deep-freeze refrigeration, autoclave, and other facilities for all types of biochemical work. Laboratories are on the third floor.

Endocrinology. Researches in endocrinology involve the hormones of the anterior pituitary, thyroid, and reproductive organs with special emphasis on their interrelationships. Laboratories and offices are on the first floor; animal quarters on the fourth. Special mention should be made of the animal rooms, some with special temperature controls, equipped for the care of chickens, rats, mice, and rabbits. Adjacent is an operating room and a chemical room. Terrazzo floors and tile walls contribute to

the ease of cleaning. An incinerator takes care of waste materials and a special room is provided for cleaning and sterilization of animal cages. The animal quarters also serve research interests other than endocrinology.

Entomology. Entomological studies within the Department are primarily taxonomic in character, although they may involve ecology and evolution. Available for research by graduate students is a collection of beetles and another more extensive collection of gall wasps. Both teaching and research laboratories are in the basement and include a comprehensive general collection of insects.

ONE OF THE ZOOLOGY ANIMAL ROOMS.



Human Sexual Behavior. Research in this area is carried on within the Institute for Sex Research. While the Institute is essentially an autonomous corporation deriving most of its financial support from outside sources, there is close association and co-operation between the Institute and the Department of Zoology. The director of the Institute, in fact, has been and still is a professor in the Department. Extensive studies on sexual behavior have been in progress for eighteen years. An enormous amount of data has been collected, two large volumes have already appeared and from fifteen to twenty more are projected. The special research library is one of the three best in the world. The Institute's quarters are on the third floor.

Genetics of Drosophila. The goal of experimentation with *Drosophila* is to add information relative to the potencies of different mutagenic agents in inducing different types of mutations in egg and sperm cells at different stages in their development. The mutagenic agents used are X rays, ultraviolet rays, electrons, neutrons, and chemicals. Laboratories and offices are on the second floor.

Genetics of Paramecium. Research in this field revolves around the problems of how chromosomes and genes interact with

the rest of the organism and the environment in controlling heredity and development. The chemicals or food needed by *Paramecium* to maintain life processes and how these materials are utilized are also being studied. Related to these basic problems and an outgrowth from them is a study of senility and death and the effects of parental age on the inheritance passed on to the offspring. This work is housed on the second floor in a series of rooms equipped with temperature controls for the maintenance of the hundreds of cultures of *Paramecium* and for chemical analyses.

In addition to rooms for general class use, for offices, and for research by the faculty, there are fourteen small laboratories for the use of graduate students. A few laboratories have also been provided for visiting or retired professors. These rooms are found on different floors, for the most part adjacent to research areas.

Special rooms which may be used for both teaching and research are: constant temperature rooms found on each floor; a seminar room on the first floor; a darkroom in the basement; a stock room in the basement; and a museum, primarily for teaching purposes, on the first floor.