

# HISTORY of ZOOLOGY-ENTOMOLOGY at AUBURN UNIVERSITY

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## EARLY PERIOD

COURSES IN ZOOLOGY and entomology were first taught in 1872 at Auburn University (then A and M College) in the department or area of Natural and World History. By 1875 the area of Natural Science was established and in 1877 zoology and entomology were taught along with other subjects by Professor Wm. C. Stubbs, A.M. Great emphasis was placed on museum collections and 26,000 specimens were catalogued by 1881 and 30,000 by 1885. The specimens were largely geological, zoological, and botanical. Skeletons of man and some wild and domestic mammals were added in 1886-87. All specimens were destroyed by fire in 1887.

Considerable reorganization took place following the destruction of the Main Building by fire. Botany-geology developed under the professorship of P. H. Mell, Ph.D. and biology under Geo. F. Atkinson, Ph.D. (1889-1892), who wrote a classic treatise on a plant nematode. By 1891, 13 microscopes were available in biology. In 1893-94, courses were being taught in zoology, entomology, and plant pathology by J. M. Steadman, B.S., Professor of Biology. From 1896 to 1901, biology and horticulture were together, and botany was still associated with geology. In 1902 biology and botany were combined and were separated from horticulture and geology. Biology courses included little zoology or entomology between 1896 and 1905. In 1906, entomology was recognized as a department, and courses were taught by Professor Warren T. Clarke, B.S., the first trained entomologist at Auburn. Clarke was succeeded in 1907 by Professor Warren Elmer Hinds, Ph.D. This area later became the Department of Entomology and Zoology (1916), then Zoology and Entomology (1919), and finally Zoology-Entomology (1930).

## LATER DEVELOPMENTS

The office of Experiment Station Entomologist was established by the Board of Trustees in 1896, and C. F. Baker, B.S., was appointed Entomologist. He served only 2 years. This office was vacant until Warren T. Clarke's appointment in 1906. Others who have served in this capacity, and concurrently as Head of the Department, include W. E. Hinds (1907 to 1923), F. L. Thomas (1924), J. M. Robinson (1924 to 1949), and F. S. Arant (1949 to date). In addition to his teaching and research activities, Dr. Hinds served as Entomologist for both the Extension Service and the State Board of Horticulture from 1920 to 1923. Responsibility for their own entomological services was then assumed by the respective agencies. W. A. Ruffin became the first full-time Extension Entomologist in 1924, and he was closely associated with the Department until his retirement in 1961.

<sup>1</sup> Professor and Head, Department of Zoology-Entomology.

F. E. Guyton joined the staff in 1921 and H. G. Good in 1924. They served 42 and 40 years, respectively, and taught more students than any other faculty member in the history of the Department.

## COURSES AND CURRICULA

Although emphasis was on natural history, taxonomy, and museum work between 1877 and 1905, the earliest course descriptions also refer to control of insects destructive to vegetation. From 1907 to 1918 major emphasis was on entomology. Three courses in entomology and one in zoology were offered in the 1918-19 school year. By 1920-21, 5 courses were offered in entomology and 3 in zoology, and course offerings increased to 10 in entomology and 8 in zoology in 1930-31. The scope of training was broadened in 1937-38 (with a total of 33 courses) to include wildlife and again in 1944-45 to include fish culture. The Zoological Sciences curriculum was established in 1952-53 with a total of 63 courses to serve students in other curricula as well as majors in zoology, entomology, fisheries management, and game management. These four areas were reorganized in 1959-60 and placed in the Biological Sciences curriculum as a major in Zoological Sciences with options in entomology, fisheries, wildlife, and zoology. The fisheries program was organized into a separate department, July 1, 1970. Seventy-nine courses are now taught in the Department of Zoology-Entomology to approximately 4,700 students from 16 curricula each year. There are 35 faculty members, 31 with the Ph.D. degree or equivalent, and 2 part-time graduate research lecturers from the USDA Regional Animal Disease Laboratory.

## GRADUATE STUDY

The graduate program in zoological sciences has grown rapidly in recent years. It began about 1893 with the enrollment of A. L. Quaintance, who received the M.S. degree in 1894 and the Doctor of Science in 1915 in biology (entomology). Three M.S. degrees were awarded in entomology between 1925 and 1929 (W. L. Owen, J. C. Gaines, and F. S. Arant) and three additional in the early 1930's. The Cooperative Wildlife Research Unit was established under the leadership of H. S. Peters in 1936, and two graduate students in wildlife management (Walter Rosene and D. N. Ruggles) enrolled that year. These students and E. A. Jones were awarded the M.S. degree in 1938. The first M.S. degree in zoology was awarded to Eugenia Rutland Moore in 1939. Henry Howell in 1941 and J. M. Lawrence in 1943 were awarded the M.S. degree in wildlife with thesis options on fisheries subjects, and the first M.S. degree in fish management was awarded

in 1948 to Jack R. Snow. The Cooperative Fishery Unit became operative in 1967 under the leadership of John S. Ramsey.

A doctoral program in Zoology was initiated in 1953. The first Ph.D. degree in zoology, with an option in fisheries, was awarded to A. K. R. Zobairi in 1955; H. H. Tippins received the Ph.D. with an entomology option in 1957; Robert A. Carlton, the first in zoology in 1958; and Dale Arner in game management in 1959. To date 75 doctoral degrees, 276 Masters, and 4 MACT degrees have been awarded to students in Zoology-Entomology. Graduate enrollment in the Department increased from 5 students in the fall of 1940 to 105 in the fall of 1969. The quality of graduate training was improved by new facilities occupied in Funchess Hall in 1961 and by subsequent addition of needed staff.

Graduates with advanced degrees are making significant contributions in their fields throughout the United States and in foreign countries. Examples of positions occupied follow: in colleges and universities, there are 2 deans, 11 department heads, 123 faculty members, 8 extension service specialists, 3 leaders of cooperative research units, 1 assistant director of an institute of natural resources, 1 director of a research laboratory, and 11 research scientists not teaching; in state agencies, there are 7 commissioners or chiefs of divisions in conservation or fish and wildlife services, 34 fish and wildlife biologists, 2 directors of crime laboratories, 1 chief of outdoor recreation, and 1 scientist each with a department of agriculture and department of health; in governmental agencies, there are an assistant chief of Bureau of Entomology and Plant Quarantine, an assistant director of EPA Pesticide Registration Branch, 12 USDA research scientists, 2 Plant Pest Control (and quarantine) scientists, 1 chief of division, 1 regional director, and 10 biologists with U.S. Fish and Wildlife Service, 3 research scientists with US PHS, 4 in armed services careers, and 15 in foreign governmental agencies; in industry, there are a president of a large agricultural corporation, 2 presidents of pest control and pesticides companies, 5 directors or coordinators of research, 6 in research and technical services work, 2 research scientists, and 2 in sales; in miscellaneous areas, there are 5 in medicine or dentistry and 2 with educational foundations; and in private business, there are at least 11 in areas related to their specialties.

## RESEARCH PROGRAM

Although early research in the Department dealt to some extent with taxonomy and museum work, principal emphasis during the early nineteen hundreds was on agricultural insects and their control. Research in entomology was under the leadership of the station entomologists, previously named. It included collecting and photographing life-stages of plant pests and studying their biology and control. Noteworthy research was done on rice weevil in corn, boll weevil, bollworm, San Jose scale, Mexican bean beetle, and other pests. As the department grew, the research program expanded to include insect pests of cotton, corn, peanuts, pasture crops, vegetables, ornamental plants, livestock and man, the household, pecans, forests, soybeans, and fruit. It also included studies on imported fire ant, insect toxicology and insecticidal residues, resis-

tance to insecticides, rotenone-producing plants, uses and limitations of insecticides including animal systemics, insect pathogens and other biological agents, sex pheromones of arthropods, resistant hosts, taxonomy and systematics, integrated control, and other areas. Research in entomology was strengthened during the fifties and sixties by substantial grants from National Institutes of Health and other sources.

Research in wildlife was initiated under the leadership of Harold S. Peters with the establishment of a Cooperative Wildlife Research Unit in 1936. Other unit leaders were A. M. Pearson, 1937-43; A. O. Haugen, 1949-57; M. F. Baker, 1958-67; and Dan W. Speake, 1967-present. The unit was inactive from 1943 to 1948. Early investigations were directed principally at farm-game animals with noteworthy accomplishments on mourning dove and bobwhite quail although other species including waterfowl, deer, and opossum received attention. More recently, research has been directed toward ecology and management of forest game animals, particularly wild turkey and deer. The changed emphasis resulted from changes in land use with large acreages going out of cultivation and into forests and other uses. Research has been done also on raccoon, beaver, cottontail rabbit, blackbirds, red jungle fowl, predators, effect of pesticides, and other subjects.

Fisheries research in the Department began in a modest way in 1934 under the leadership of Homer S. Swingle, an entomologist interested in improving fishing—his hobby. Early work dealt with experiments on fertilization and stocking rates in small farm ponds. Species of fish used successfully were mainly bluegill bream, shellcracker bream, and largemouth bass. The program received considerable impetus during and immediately following World War II with the purchase of land and the building of ponds for research. These acquisitions with funds made available by M. J. Funchess, Director, Agricultural Experiment Station, laid the foundation for development of the best physical facilities in the world for research in warm-water pond fish culture. The expanded research on fish production for sport and food (including catfish farming), fish parasites and diseases, water quality and pollution, aquatic weeds, and other areas attracted national and international attention. Grants from Rockefeller Foundation in the mid-sixties provided funds for further expansion of research directed toward providing proteinacious food to underprivileged people in developing countries. Subsequently, grants from U.S. Agency for International Development made possible the establishment of an international center of aquaculture to expand further the program to provide better food for people in developing countries. As a result, the fisheries work was organized into the Department of Fisheries and Allied Aquacultures, July 1, 1970, with Dr. H. S. Swingle as Head.

Following the work of Stubbs and others on museum collections and Atkinson on nematodes of plants in the late eighteen hundreds, little research was done in zoology proper until the nineteen thirties when Reed O. Christenson initiated research in parasitology with emphasis on internal parasites of poultry. Subsequently active research programs have been developed, principally by full-time teachers, in physiology with emphasis on endocrinology and reproductive physiology, genetics and mutagenetics, parasites of wild animals and man, herpetology with em-

phs: on reptiles of Alabama, ichthyology, biology and ecology of non-game birds, taxonomy, life history, distribution, and ecology of non-game mammals, paleontology with emphasis on turtles, coprophagy and detritus-feeding animals, hydradephagous beetles, and other areas. Much of this work is supported by extramural funds.

### ACADEMIC STAFF

No history is complete without a record of personnel and some indication of the contribution of each. Academic staff members in the Department with the rank of Assistant Professor and above are listed below with information on dates of service and fields of specialization: W. Elmer Hines, Ph.D., Amherst, economic entomology (field crop & vegetable insects), 1907-23; William F. Turner, B.S., Massachusetts, economic entomology, 1908-12; J. E. Buck, M.S., entomology, 1912-15; F. L. Thomas, Ph.D., Massachusetts, entomology, apiculture, 1915-24; Jesse M. Robinson, M.S., Ohio State, field crop entomology, zoology, genetics, 1919-49; Fay E. Guyton, M.S., Ohio State, economic entomology, apiculture, ichthyology, 1921-63; Henry G. Good, Ph.D., Cornell, basic entomology, taxonomy, ornithology, zoology, 1924-64; F. S. Arant, Ph.D., Iowa State, entomology (insect biology & control) zoology, parasitology, 1926-present; Lester L. English, Ph.D., Iowa State, insects of citrus & ornamental plants, 1928-46; Homer S. Swingle, M.S., D.Sc., Ohio State, entomology 1929-38, fisheries, 1939-70; Harold S. Peters, M.S., Ohio State, wildlife, 1936-37; Reed O. Christenson, Ph.D., Minnesota, parasitology, 1937-46; Allen M. Pearson, Ph.D., Iowa State, wildlife & forest entomology, 1937-43 & 1947-present; Donovan H. Copeland, B.S., Auburn U., zoology, 1939-48; Elmer A. Jones, M.S., Auburn U., zoology, ichthyology, 1939-47; Ellis E. Prather, M.S., Michigan, fisheries, 1941-42 & 1945-70; Faye B. Lawrence, M.S., Auburn U., zoology, 1946-50, 1952-56, 1959-present.

John M. Lawrence, Ph.D., Iowa State, water quality, aquatic weeds, 1946-70; Robert M. Prather, M.S., Emory, zoology, 1946-50; George H. Blake, Ph.D., Illinois, economic entomology, apiculture, 1947 & 1950-present; John S. Dendy, Ph.D., Michigan, invertebrate zoology, limnology, ichthyology, 1947-present; John E. Wood, M.S., Texas A & M, zoology, 1947-49; William G. Eden, Ph.D., Illinois, economic entomology, field crop insects, 1948-65; William D. Ivey, Ph.D., Emory, zoology, embryology, genetics, 1948-present; Marvin E. Merkl, Ph.D., Texas A & M, cotton insects, 1949-50 & 1952-53; Julian L. Dusi, Ph.D., Ohio State, ornithology, mammalogy, 1949-present; Arnold O. Haugen, Ph.D., Michigan, wildlife, ecology, 1949-57; Ray Allison, Ph.D., Louisiana State, general parasitology, fish parasites, 1950-56 & 1958-70; Frank W. Fitch, M.S., Texas A & M, wildlife, 1950-54; Gordon B. Mainland, Ph.D., Texas, zoology, genetics, 1950-51; Henry F. Turner, Ph.D., Iowa State, parasitology, zoology, 1950-63; Hugh B. Cunningham, Ph.D., Illinois, basic entomology, systematics, evolution, 1951, 1953-54, & 1965-present; Lacy L. Hyche, M.S., Auburn U., entomology, forest insects, 1952 & 1954-present.

B. Wayne Arthur, Ph.D., Wisconsin, entomology & insect toxicology, 1953-63; Kenneth Ottis, Ph.D., Iowa State, physiology, endocrinology, 1953-present; James A. Griffin, M.S., Auburn U., cotton insects, 1954-57; Dale A.

Porter, Sc.D., Johns Hopkins, research lecturer in helminthology, 1954-69; Robert L. Robertson, M.S., Auburn U., entomology, cotton insects, 1954-57; E. Wayne Shell, Ph.D., Cornell, fisheries, 1954 & 1958-70; Dan W. Speake, Ph.D., Auburn U., wildlife, 1955-present; Hamlin H. Tippins, M.S., Auburn U., entomology, 1955; Jack S. Mecham, Ph.D., Texas, herpetology, ecology, 1956-65; Robert H. Mount, Ph.D., Florida, herpetology, ecology, 1956 & 1966-present; Kirby L. Hays, Ph.D., Michigan, medical entomology, ecology, 1957-present; James W. Rawson, Ph.D., Texas A & M, cotton insects, 1957-61; Maurice F. Baker, Ph.D., Kansas, wildlife ecology, 1958-67; Dean S. Hays, M.S., Auburn U., zoology, 1958-63 & 1967-69; Max H. Bass, Ph.D., Auburn U., entomology, field crop insects, 1959-present; R. O'Neal Smitherman, Ph.D., Auburn U., fisheries, 1961-64 & 1967-70; Theo F. Watson, Ph.D., California at Berkeley, cotton insects, biological control, 1962-66.

Robert S. Berger, Ph.D., Cornell, insect toxicology & physiology, sex pheromones, 1963-present; Reuben B. Bcozer, M.S., Peabody, zoology, 1963-67; T. Don Canerday, Ph.D., Auburn U., economic entomology, biological control, 1963-68; George N. Greene, Ph.D., Auburn U., fisheries, 1963-70; Sidney B. Hays, Ph.D., Clemson, entomology, fire ant, 1958-59 & 1963-64; A. Sidney Johnson, III, M. S., Auburn U., wildlife, zoology, 1963-68; Carl F. Dixon, Ph.D., Kansas State, parasitology, helminthology, 1964-present; Wilmer A. Rogers, Ph.D., Auburn U., fish parasitology, 1964-70; George E. Krantz, Ph.D., Pennsylvania State, fish diseases, 1965-66; Jack E. Watson, Ph.D., Purdue, genetics, 1965-present; Paul M. Estes, Ph.D., California, corn & pecan insects, bionomics, 1966-present; Nickolas Fijan, Sc.D., U. of Zagreb, fish diseases, 1966-68; George W. Folkerts, Ph.D., Auburn U., zoology, systematics, herpetology, 1966-68 & 1969-present; William H. Mason, Ed.D., Georgia, zoology, ecology, coordinator biology, 1966-present; Claude E. Boyd, Ph.D., Auburn U., fisheries, 1967-68; L. Reid Davis, Ph.D., Iowa State, protozoology research lecturer, 1967-present; James L. Dobie, Ph.D., Tulane U., herpetology, zoogeography, paleontology, 1967-present; John C. Frandsen, Ph.D., Utah, helminthology research lecturer; 1967-present.

Floyd R. Gilliland, Ph.D., Mississippi State, cotton insects, insect behavior, 1967-present; Edward P. Hill, M.S., Auburn U., wildlife, 1967-present; Costas A. Kouskolekas, Ph.D., Illinois, insects of ornamental plants & vegetables, 1967-present; Donovan D. Moss, Ph.D., Georgia, fisheries, 1967-70; John S. Ramsey, Ph.D., Tulane U., ichthyology, ecology, 1967-present; M. Keith Causey, Ph.D., Louisiana State, wildlife ecology, pesticides, 1968-present; Norris B. Jeffrey, Ph.D., Auburn U., fisheries, 1968-70; Garland B. Pardue, Ph.D., Auburn U., fisheries, 1968-70; H. R. Schmittou, Ph.D., Auburn U., fisheries, 1968-69; Jane A. Wilson, Ph.D., Clemson, zoology, physiology, 1968-present; J. M. Barkaloo, M.S., Stetson, fisheries, 1969-70; James D. Harper, Ph.D., Oregon State, insect pathogens, biological control, forest entomology, 1969-present; Kent L. Jones, Ph.D., Oklahoma State, physiology, endocrinology, 1969-70; R. T. Lovell, Ph.D., Louisiana State, fish nutrition, 1969-70; Lawrence R. Valcovic, Ph.D., North Carolina State, cell physiology, biochemical genetics, 1969-present; James E. Kennamer, Ph.D., Mississippi State, wildlife ecology, 1970-present; Michael E. Lisano, Ph.D.,

Texas A & M, endocrinology, reproductive physiology, 1970-present; Thomas M. Pullen, Ph.D., Georgia, zoology, wildlife, 1970-present.

### ADDITIONAL STAFF MEMBERS

Additional staff members who served as instructors or temporary employees are listed below as follows: John C. Hammond, M.A., zoology, 1935-36; Fred S. Barkalow, B.S., zoology, 1936-39; John D. Black, Ph.D., zoology, 1941-43; J. W. Webb, M.S., fisheries, 1944-45; Edgar Evans, A.B., zoology, 1946-47; Joseph A. Schmitz, B.A., zoology, 1946-47; Phyllis L. Edgar, A.B., zoology, 1947; Eddie B. Vinson, B.S., entomology, 1947-48; Alec L. Norris, B.S., entomology, 1948; Marnita M. Walden, A.B., zoology, 1949-50; Charles A. Rouse, M.S., zoology, 1949-51; William L. Seal, M.S., entomology, 1950; James R. Fielding, Jr., M.S., fisheries, 1950-52; Malcolm C. Johnson, M.S., fisheries, 1950-52; Jack D. Sherrer, entomology, 1951-52; James H. Padfield, M.S., fisheries, 1952-53; Bobby B. Mosely, entomology, 1953; James E. Dukes, B.S., zoology, 1954; Jack S. Brown, M.S., zoology, 1954-55; Jeane L. Carlton, B.S., zoology, 1954-55; Carlos H. Cantu, entomology, 1955; Peggy W. Whitlock, A.B., zoology, 1955; Robert A. Carlton, M.A., zoology, 1955-56.

Walter H. Grimes, B.S., entomology, 1956; Gerald D. Webb, entomology, 1956; Paul F. Ziegler, Ph.D., entomology, 1956; Theodore R. Adkins, Jr., M.S., entomology, 1956-57; William C. Bargren, B.C.S., zoology, 1956-59; Don W. Stubbs, M.A., zoology, 1956-60; John A. Searcy, B.S., entomology, 1957; Bernard L. Owen, M.S., entomology, 1957-58; R. D. Blackburn, B.S., fisheries, 1958-59; F. Eugene Hester, Ph.D., fisheries, 1958-59; Robert H. McIlwain, B.S., zoology, 1959; Ruth P. Speake, B.S., zoology, 1960; Sam L. Spencer, B.S., fisheries, 1960-62; Rebecca D. Ingle, B.S., zoology, 1960-63; L. G. Sanford, Ph.D., zoology, 1960-63; Phillip G. Beasley, M.S., fisheries, 1960-64; Bradford E. Brown, M.S., fisheries, 1961-62; Peter F. Olsen, M.S., zoology, 1961-63; Kenneth E. Landers, M.S., zoology, 1963; Jon P. Shoemaker, Ph.D., parasitology, 1963-64; Billy J. Grantham, M.S., fisheries, 1964; Charles M. Fugler, M.S., zoology, herpetology, 1964-65; Margaret Frady, M.S., zoology, physiology, 1964-66; Heino Beckert, M.S., fisheries, parasitology, 1964-67; Margie A. Mantell, M.S., zoology, genetics, 1964-67; Carolyn F. Bradley, A.B., zoology, 1966-67; Wayne E. Swingle, M.S., fisheries, 1966-67; Harry W. Stickney, M.S., wildlife, 1967; Claranne L. Bush, M.S., physiology, 1968-69; Elizabeth F. Cook, M.S., physiology, 1969-present.



