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in the mating behavior of African frogs. Mrs. Keith's work will provide a firm foundation for investigations of isolating mechanisms and the extent of the diversification in the frog fauna of Africa.

Members of the department also devoted a large part of their time to curatorial duties and to services to laymen and scientific colleagues. Included in the approximately 5500 herpetological specimens added to the collections during the year was a generous gift from the Department of Tropical Research of the New York Zoological Society of some 1600 specimens accumulated by the late Dr. William Beebe and his associates.

DEPARTMENT OF ICHTHYOLOGY

Charles M. Breder, Jr., Chairman

Several different events this year indicate the directions in which the researches of the Department of Ichthyology will move for some time to come. The first major expedition to be undertaken by the department in a number of years was eminently successful. While studies were continued in the areas of life history, ecology, physiology, and genetics, there was a considerable increase in the taxonomic pursuits of the staff. Finally, for the first time in a long period, every position in the department has been filled satisfactorily.

A long-term project on the reproductive characteristics of fishes was concluded with the completion by Dr. Breder and Dr. Donn E. Rosen of a 2000-page manuscript which is a compilation and critical review of the literature on this subject.

Field work in the continuing studies by Dr. Breder of Gulf Coast fishes moved to the winter and summer seasons, investigations in the spring and fall quarters having been undertaken the previous year. This research, which is supported by a National Science Foundation grant, is being done in association with the Cape Haze Marine Laboratory, the Director of which, Dr.

Eugenie Clark, supervised the collection of pigmentation data by students in the summer of 1962 when Dr. Breder was unable to be in the field.

Dr. Rosen, in collaboration with Dr. Klaus Kallman of the New York Zoological Society, undertook an extensive three-month expedition to Guatemala, British Honduras, and Mexico, and brought back much valuable material from localities in which there had been little or no previous collecting. Important discoveries were endemic faunas in an isolated river basin in Alta Verapaz, Guatemala, and in the sulphur waters of Las Grutas de Coconá, Chiapas, Mexico, as well as many areas where preliminary sampling revealed the presence of numerous undescribed forms. The expedition, which was made possible by a grant from Mr. James C. Greenway, Jr., traveled by foot, mule, horse, Jeep, and Cessna 180, the last of which was used to enter remote and otherwise inaccessible areas and to check the drainage patterns of all the rivers from which material was collected.

Studies on the population dynamics of the mosquito fish (*Gambusia*) were continued by Dr. Rosen at the Kalbfleisch Field Research Station. He also devoted attention to phylogenetic studies of the major groups of bony fishes and to his contribution, covering the killifishes, to the series of volumes on fishes of the western North Atlantic.

Dr. C. Lavett Smith, who was appointed to the department staff on July 1, 1962, brought with him a revision of the American groupers on which he made considerable progress during the year. In this connection he spent six weeks at the Lerner Marine Laboratory of the Museum to investigate various hermaphroditic species, the reproductive details of which are little known. Dr. Smith also described a new species of goby from a collection of fishes he had made in the Pacific.

Dr. Phyllis H. Cahn expanded her studies on physiological development while continuing collaboration with Dr. Evelyn Shaw on research in the schooling behavior of fishes. Using a