planning, indeed, a new venture in the interests of our science.

With Cushny's death there was lost to humanity a striking example of a life devoted to high and unselfish purposes. Only those bound to him by ties of blood can mourn his passing more than does the writer.[1]

JOHN J. ABEL

JOHNS HOPKINS UNIVERSITY

## THE DEPARTMENT OF TROPICAL RESEARCH OF THE NEW YORK ZOOLOGICAL SOCIETY

FOR nine years the New York Zoological Society has maintained this department, and the year 1925 has been the most successful. Three important undertakings are given in the résumé below:

First, the Arcturus Oceanographic Expedition, which left New York on February 10, 1925, and returned July 30, having carried on work in the Sargasso Sea in the Atlantic and in the waters about Cocos Island and the Galapagos Archipelago in the Pacific. Months of careful preparation were devoted to the selection of the staff and the outfitting of the converted freighter, the *Arcturus,* which was given to the society by Mr. Henry D. Whiton. The greater part of the financial burden was undertaken by Mr. Harrison Williams, and Messrs. Marshall Field, Vincent Astor, George Baker, Jr., and other gentlemen also contributed generously.

While a certain amount of shore work was done at the islands visited, our activities were confined almost exclusively to the fauna of the deep sea and of the shallow waters around the islands. Special attention was given to the study of the habits of littoral fishes, work which was much facilitated by the use of a copper diving helmet; the luminescence of deep sea animals was a vast and intensely interesting field of research, in which some remarkable problems were worked out, while the locomotion and distribution of various forms and the study of larval fish yielded important results.

We were so fortunate as to be present at a volcanic outbreak on Albemarle Island, in the Galapagos, of which splendid moving pictures were obtained, and chanced upon an extraordinary current rip in the Pacific which teemed with fish, birds, mammals and even reptiles, as well as incredible numbers of invertebrates.

We returned to New York with large collections, including many new species of deep sea fish, tremendous quantities of plankton, seven hundred photographic negatives, eleven thousand feet of excellent moving pictures and about four hundred colored plates made from living oceanic creatures. Since that time an elaborate exhibit of specimens, apparatus, photographs and paintings has been held at the American Museum of Natural History, and Miss Cooper has held exhibitions of her paintings in Chicago and Washington. Over fifty lectures have been given by myself and Ruth Rose throughout the country and fifteen articles have been published in the *Zoological Society Bulletin* and other magazines. Many collections have been prepared for technical study, and some are now being worked over by specialists.

A volume, "The Arcturus Adventure," has just appeared, treating of the expedition from the same popular angle as the book published by Putnam's two years ago, "Galapagos: World's End."

A gratifying result of the two expeditions—one on the *Noma* in 1922 and that of the *Arcturus* in 1925—has been the interest which they have awakened in others to carry on work near the Galapagos. I was able to give some assistance to Mr. Harry Payne Bingham for his oceanographic trip in the *Pawnee* to the Caribbean, which aroused his enthusiasm to such an extent that he has now built a ship specially for such work. Mr. William K. Vanderbilt, who has just returned from an oceanographic expedition to the Galapagos on the yacht *Ara,* drew upon our experience in the outfitting of his ship and in methods of collection, and has brought back many interesting specimens for identification and study. Zane Grey consulted with me concerning the big-game fishing trip which he afterward made to the Galapagos on his schooner *Fisherman* and concerning which he has since published an interesting volume.

Four United States cruisers visited the Galapagos on their way home from Australia, and Commander Kalbfuss sent me an account of the volcano, which in late September was still in eruption, together with airplane pictures of the lava pouring into the sea.

The most unexpected result of the *Arcturus* expedition was the great interest which it aroused, not only in this country but abroad. The only direct outside articles about it appeared in the New York *Times,* consisting of wireless accounts, and more detailed stories which were sent by mail as opportunity offered.

The second part of the year's work falls under the head of the zoological work by the department dealing with the fauna of Kartabo, British Guiana. For parts of eight years my staff and myself have engaged in intensive study of a quarter of a square mile of jungle in this rich field. During the past year more has been published concerning it than in

[1] The reader will find a complete bibliography of Dr. Cushny's writings in the April issue of the *Journal of Pharmacology and Experimental Therapeutics.*

any preceding one, which is particularly gratifying when the contemporary labor of the *Arcturus* is considered. Five important technical papers have appeared in *Zoologica,* the society's publication, consisting of monographs on the "Ecology of a Quarter of a Square Mile of Jungle," the "Variegated Tinamou," "the "Membracidae," the "Termites," and the "Isopods." These form one complete volume of *Zoologica,* Volume VI, containing over five hundred pages. A volume of popular essays, "Jungle Days," has also been published by Putnam's, while additional monographs on the life history of the three-toed sloth and the fish of Kartabo are already in type.

Among other gifts, fifty Isopods, including two types, and five hundred and eighty Lepidoptera have been given to the American Museum; a summary of the Coleoptera taken in the quarter of a square mile shows 1,093 species and 4,006 specimens.

The third division of this report deals with zoological work at Kartabo by the University of Pittsburgh. Under an agreement the university operated the station in British Guiana during the summer of 1925, opening it on June 8, and closing September 15. The matter for this report is furnished by Dr. S. H. Williams, who was in charge of the university class. The party, under his direction, consisted of twenty students representing ten American colleges and universities, and Howard E. Enders, professor of biology at Purdue University, as associate.

The policy of administration was one of conservation rather than exploitation. Many phases of life were studied and coincident ecological observations were carefully made. Specialized studies were as follows:

*Serpents*: Twenty-seven species were recorded, together with many notes on their habits, their arboreal, terrestrial and burrowing adaptations.

*Spiders*: A great variety of forms were collected and observations on their habits made. Attempts to study the virulence of the tarantulas were frustrated by total failure to induce the captives to bite.

*Geoplanidae*: A comprehensive survey of the Geoplanidae was carried on, but it is impossible yet to estimate the number of species secured.

*Mollusks*: Twenty-three species of land Gastropods were found and their habitats recorded. The aquatic forms are very scarce, not many species of either Gastropods or Pelecypods being found. The number of species and specimens was comparatively small, but the intensive study, in which every collecting device was used, was ecologically important.

*Trichoptera*: These were scarce in the months of June, July and August. Many larvae of *Heliopsyche* and *Hydropsyche* were taken along the river shores. Twelve species were taken. Efforts to raise adults in laboratory tanks and in mesh traps placed in the localities where larvae were found proved disappointing.

*Hemiptera*: Almost three hundred species of these, exclusive of the Membracidae, were collected.

*Coleoptera*: About six hundred species of beetles were taken, many of them being new to the previous collections.

*Diptera*: Two hundred species of dipterous insects (exclusive of the Tipulidae) were collected during the summer.

*Lepidoptera* (*Heterocera*): A rough estimate of the species collected places them at one hundred and fifty. No systematic collection of butterflies was made.

*Parasites*: Ectoparasites were collected extensively. All birds and animals, including monkeys, sloths and ant-eaters, were examined for Mallophage, Acarinids and ticks, and the entrails of all animals killed were examined for endoparasitic forms. Wasps were examined for Strepsiptera, and beetles for mites. In the last two cases the families and genera were, wherever possible, carefully recorded for comparison with our northern forms. Ticks, chigoes, bête-rouge and warble-flies were collected from rats, toads, monkeys —and the members of the party.

A systematic collection of Odonata was made for Dr. Hugo Kahl, of the Carnegie Museum.

In addition to the above a fresh-water porpoise was secured by great good fortune. It was the third specimen to reach the United States and will be reported in a special paper.

During the summer Professor H. D. Fish, head of the department of zoology of the University of Pittsburgh, visited the station to see what repairs and additional equipment would be necessary if the opportunity for further use should be offered.

The summer was a profitable one, and the possibilities for further studies in this spot are practically unlimited.

WILLIAM BEEBE

NEW YORK ZOOLOGICAL PARK

## THE BROOKLYN BOTANIC GARDEN

THE Fifteenth Annual Report of the Brooklyn Botanic Garden for 1925 has just been published. For the past fifteen years the people of Brooklyn, and in fact of all five Boroughs of Greater New York, have watched this institution grow from anticipations and blue prints to one of the leading scientific and educational institutions of the city.

In the matter of its educational work the Brooklyn Botanic Garden is a pioneer, and its educational program is now more extensive than that of any other botanic garden. Over 4,000 adults and children were registered in its various classes during 1925. The attendance of visiting classes from the public and pri-