

if this practice were adapted to-day by all scientific bodies as a first essential to conserve the precious intellectual heritage of the past against the menace of falsification and error and ridicule. To-day, unfortunately, there is not the serious jealousy against the inroads of the imposter and amateur now into one branch of science, now into another. Conversely, there is need of a broader scientific spirit, of a more hearty encouragement of all seekers after truth, in place of the narrow-minded attitude so often displayed by men who could be of the greatest aid to those who are doing pioneer work outside of the recognized field of the scientist of the academies. Sir E. Ray Lankester illustrates this point by calling attention to the fact that "The delay in the establishment of the doctrine of organic evolution was due not to the ignorant and unobservant but to the leaders of zoological and botanical science," an attitude of hostility which has by no means passed away.

I can not do better than draw one further observation from Sir E. Ray Lankester's essay: "Outside the scientific world an immense mass of observations and experiments had grown up in relation to this subject (genetics). From the earliest times the shepherd, the farmer, the horticulturalist, and the 'fancier' had for practical reasons made themselves acquainted with a number of biological laws and successfully applied them without exciting more than an occasional notice from the academic students of biology." But, he adds, "It was one of Darwin's great merits to have made use of these observations and to have formulated their results to a large extent as the laws of variation and heredity."

Over-specialization is developing a type of scientific mind as much to be guarded against as the credulous and ignorant. The limitations further emphasize the necessity of a broad scientific spirit anxious to give furtherance to the seeker after truth in whatever direction and by whatever methods useful results may be obtained. For, in its final analysis, every discovery rests primarily upon the power of observation or fact gathering, and discrimination and aptitude in fact classification and

analysis, which may or may not require the aid of modern instruments of precision. Modern man is only too apt to forget the vast achievements of the ancients. The four greatest inventions of an earlier period were all made without the modern aids to scientific discovery, but by men gifted with a disciplined imagination. Printing, Gunpowder, Steam, and the Compass did more to change the face of the world and the fortunes of mankind than Electricity, Wireless Telegraphy, Motion Pictures, and the Graphophone.

The foregoing observations have been included in the present discussion to further emphasize the view that a true organization of knowledge is essential to the future of scientific discovery, as well as to the needs of the more complex life of to-day and of the years to come. But more than this would I try to make clear the conclusion that science in the more restricted technical sense should do more to encourage the development of science in the larger or more universal sense, and therefore enlist the aid of any and all means available in place of a narrow spirit of aloofness unworthy of the aims and ideals of the sincere seeker after truth.

FREDERICK L. HOFFMAN

THE PRUDENTIAL INSURANCE
COMPANY OF AMERICA,
NEWARK, N. J.

(To be concluded.)

THE FIFTH YEAR OF THE TROPICAL RESEARCH STATION

THE Fifth Expedition of the New York Zoological Society to the Tropical Research Station at British Guiana, sailed on the "Maraval" on February first, with nine members under Director William Beebe. As in previous years, the chief assistant is Mr. John Tee-Van. Mr. Paul Howes, who was a member of the first expedition, will work on the field staff. The artist is Miss Mabel Cooper who is completing her remarkable series of drawings from the life of living reptiles, amphibians and fishes. The party will continue tropical research at Kartabo until after the long rainy

season, when a sub-station will be established upriver at Kaieteur Falls for the study of this elevated fauna, which differs considerably from that of the coast.

The researches of Director Beebe on the syrinx of birds will be continued, as well as intensive studies on primitive living types in their environment, especially *Peripatus*, the hoatzins, the armored catfishes, and on the entire environmental complex. The remaining hoatzin material for the American Museum group will be collected and data completed for one hundred large colored plates to be issued in a series of volumes uniform in size with Director Beebe's "Monograph of the Pheasants." It is hoped that the Station may be kept open throughout the year and through the succeeding winter of 1922-1923, to permit a number of British zoologists to come from England and begin work at the Station. Moving pictures of mammals, birds, and reptiles will be taken of all the subjects studied, and large mirrors have been secured for photographing in the deep jungle.

The work in the Tropical Research Station during the year 1921 may be best presented in calendar form. From January 1 to March 15 the expedition continued in the field, each member pursuing his or her particular line of research. Unusual discoveries were made in the Director's study of the syrinx of birds, for example, that in certain decapitated birds every note can be reproduced by manipulation of the lungs and trachea. On February 12 an important trip was made to Kaieteur Falls, the party including Mrs. Theodore Roosevelt and four members of the Station's staff. Many new and interesting specimens were collected and the ground thoroughly surveyed for the establishment of a sub-station another year. The Falls are the highest in the world, eight hundred and ten feet in all, about five times as high as Niagara. Upon return to Kartabo the regular exploration and research were resumed. The expedition returned to New York in April. Owing to a very serious fire on board the steamer at St. Kitts, the entire collection, in-

struments and equipment required a thorough overhauling and repairing. The photographic negatives especially had to be removed from their envelopes and washed, and the microscope boxes reconstructed. The collection of live animals brought to the Zoological Park included the Crested Curassow, South American Rattlesnake, Boa, Giant Anteater, Capuchin Monkey and Caiman. The most notable was a young Red Howling Monkey, George by name, the first ever brought up successfully and established in the collections of the Zoological Society.

The members of the 1921 expedition are now widely scattered. Professor J. F. M. Floyd returned to his department in the University of Glasgow; Dr. Alfred Emerson now holds the position of Assistant Professor in the University of Pittsburgh, and Clifford Pope is engaged in herpetological work in central China with the American Museum Asiatic Expedition. During the period of May to December Director Beebe completed the manuscript and proof of Volume III of the Pheasant Monograph, and completely finished the manuscript of Volume IV. The entire British Guiana collections were catalogued, index files established, and much of the vast quantity of material arranged and correlated ready for publication after another season's accretions. Several weeks were devoted to perfecting a new method of hand-colored lithography, which will be put into operation next year in issuing the series of one hundred large colored plates, together with life histories. During October to December, in aid of publicity, Director Beebe gave about twenty-five lectures in various cities, dealing with the work and activities of the Tropical Research Station. Addresses were also made before the New York Academy of Sciences, the American Geographical Society and the Annual Meeting of the Trustees of the New York Zoological Society. During the year twenty-six publications were issued.

H. F. O.

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