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A UNIQUE STATION FOR BIOLOGICAL RESEARCH IN THE TROPICS¹

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For hundreds of years the Tropics have served as a particularly potent lure to leading biologists in all parts of the world. It is not the result of mere chance that, to most of us, pictures of tropical regions have represented the embodiment of our conception of primeval conditions of life. Of course primeval conditions were not necessarily "tropical," but it is the torrid regions of the surface of the earth that of all terrestrial areas have most successfully resisted the encroachment of civilized man with the modifications of "natural" conditions that have inevitably marked his coming. That the high seas are undominated by man is attributable not so much to the biological conditions as to the physical conditions which make such areas impossible for permanent occupancy. With the Tropics, on the other hand, man meets not only the resistance of physical conditions, which are more easily overcome, but also that supreme luxuriance of plant and animal life which not only obstructs the initial invasion but also by guerilla tactics makes virtually impossible the effective consolidation of any extensive area of invaded territory. There we have manifested to the highest degree the forces of organic pressure which have generally prevented either the development of an advanced civilization or the long endurance of one that may have met temporary success against almost insurmountable conditions.

¹ The "author's" part is rather that of an editor availing himself freely of materials from the annual reports of Dr. Barbour and Mr. Zetek and the notes of Dr. I. F. Lewis, past chairman of the Division of Biology and Agriculture, National Research Council.

The Tropics are therefore the most favorable place for the study of a great diversity of both primitive and highly specialized types of plant and animal life and for inquiry into the conditions of animal and plant life in states almost entirely unmodified by human influence. Stark competitive conditions prevail, but the competition is between individuals and societies of animals and of plants rather than between wild animals and plants as opposed to relatively ineffective man. Few, if any, biologists who have attempted to carve a temporary path through the rich jungles, who have faced the prolific manifestations of plant and animal multiplication and evolution, who have contemplated the bewildering display of color, size and forms in fauna and flora, and who have given ear to the impressive alternations of silence and animal orchestration, have failed to derive an enduring intellectual stimulus.

Geographers will readily assure us that it is due to no accident that a populous and allegedly prosperous nation has developed in a strictly temperate region of the northern hemisphere. The United States has one, and only one, tropical continental possession, and that is the Canal Zone, but for its domination it proved necessary to modify laboriously and expensively the original natural conditions. It was not the physical difficulties encountered in Panama that so long baffled and effectually stalled the efforts to make a connecting waterway between the Atlantic and Pacific through the Isthmus of Panama. The real obstacles to be overcome were primarily biological and, as is universally recognized, it was



BARRO COLORADO ISLAND BIOLOGICAL STATION, SHOWING PORCH OF MAIN LABORATORY BUILDING; DR. BARBOUR'S HOUSE TO LEFT IN WOODS; MR. ZETEK'S OFFICE TO THE RIGHT; HOUSE FOR ELECTRIC GENERATOR IN FOREGROUND UNDER BIG COCONUT PALM.

the biological developments of the early part of the twentieth century rather than advances in engineering that made possible the building of the Panama Canal.

The Canal Zone itself is a narrow and extremely modified tropical area, but it embraces a remarkable island—a body of land that is insular in a double sense. Topographically, a formerly prominent forested headland now emerges from the surface of a large artificially formed lake as a true island in the physical sense. Biologically, this body of land, some three and one half miles in diameter, is a floral and faunal island, to be perpetuated as such since it was officially designated by Governor J. J. Morrow in 1923 as a national park, to be reserved for scien-

tific uses. In 1924 the island became the home of a research establishment under the auspices of the Institute for Research in Tropical America, then an agency of the National Research Council. Although this laboratory has at times led a precarious life, it has continued to exist, to develop healthfully and to serve as a unique and highly useful institution for tropical research, chiefly because of the unfailing interest and unflagging support of Dr. Thomas Barbour, chairman of the executive committee of the institute, and the consistent and invaluable volunteer service of Mr. James Zetek.

Barro Colorado Island, with an area of about six square miles, has a maximum



WILLIAM MORTON WHEELER TRAIL.



SLOTHIA ISLAND AND LAKE FROM LABORATORY, MAINLAND BEYOND.

elevation of 452 feet above the surface of the lake. Almost entirely wooded, it is surrounded by Gatun Lake, with a shore line of more than 100 miles and hundreds of bays and inlets, fed by the Chagres and Gigante Rivers. It possesses the highly advantageous qualities of being accessible at no great expense, having an excellently equipped laboratory with an administration hospitable to all interested and qualified scientists and harboring undisturbed fauna and flora in great diversity and abundance. The natural conditions are indeed modified only by the provision of the necessary laboratory, living quarters, landing docks and the trails necessary to give access to the various parts of the reservation on which studies may be pursued.

Among the forms of animal life on the island are 250 species of birds and 53 species of mammals, including opossums, sloths, anteaters, armadillos, peccaries, deer, tapir, agoutis, squirrels, raccoons, coatis, ocelot, bats, capuchin monkeys,

night monkeys and black howlers, to say nothing of insects too numerous to mention.

Accessible from the laboratory as headquarters are the tropical forests of Panama and particularly the new Forest Reserve in the Canal Zone—"A singularly beautiful area of really good luxuriant forest, lots of interesting plants, birds, insects, etc., and a chance to see the old 'gold road' which originally ran from old Panama to the head of navigation in the Chagres River at Las Cruces—for the new concrete road cuts directly across this, the oldest road on the American continent—indeed the original cobblestone paving can plainly be seen. . . ." In this Reserve, set aside by Colonel Harry Burgess in 1930, are walks from which one can not get lost and from which a lot of tropical wild life can be observed.

Although unfortunately the institution has never enjoyed the assurance of permanent financial support, it has already

acquired a notable history in service to scientists of diverse interests and in biological productivity, as evidenced by the extended list of publications made possible wholly or in part through research conducted in or from the Barro Colorado Island Biological Station in the Panama Canal Zone. The number of published papers now credited to the laboratory—and the list must unfortunately and unavoidably be incomplete—now totals 316, or an average of more than twenty-two per year. Besides yielding reports of mainly technical interest the laboratory



INLET ON NORTH SHORE OF BARRO COLORADO ISLAND.

has contributed its part to such books of popular appeal as Standley's monograph on the "Flora of the Panama Canal Zone," Sturgis' "Field Book of Birds of the Panama Canal Zone," Chapman's "My Tropical Air Castle," Snyder and Zetek's "Termites and Termite Control" (two chapters contributed to the volume published by the University of California), Weston's "Fungi of Barro Colo-



"MY TROPICAL AIR CASTLE," OF FRANK M. CHAPMAN.



ROOF OF THE JUNGLE FROM THE LOOKOUT ON HIGHEST POINT OF THE ISLAND.

rado," Carpenter's "Field Study on the Behavior and Social Relations of Howling Monkeys," Bailey's "Palms of Panama," Rau's "Bees and Wasps" and Schneirla's "Studies on Army Ants in Panama."

The list of names of those who have worked in this laboratory constitutes an impressive register of contemporary biologists interested either in tropical science or in biological research for which material must be sought in tropical regions. Among such are W. C. Allee, Frank M. Chapman, O. F. Cook, F. E. Lutz, Maynard M. Metcalf, George H. Parker, Alexander Petrunkevitch, Franz Schrader, W. H. Weston, W. M. Wheeler, G. B. Wislocki, L. L. Woodruff and Robert M. Yerkes, to cite only a few names typifying a diversity of biological fields of activity. Even more impressive is the great number of letters from former table occupants containing expressions of grateful and even enthusiastic apprecia-

tion of the courtesies and facilities extended to them and the effective aid rendered to their efforts in research.

Such is the one tropical biological research station maintained under the American flag and at present supported only by table subscriptions from eight institutions,² the modest fees from visiting scientists and voluntary contributions from a limited number of personal friends of the laboratory. Universities, biological societies, other institutions for the advancement of biological research and biologists in general may well be interested and concerned with the future of so valuable an agency for biological science.

²The following institutions supported the island through table subscriptions in 1937—Smithsonian Institution, Dartmouth College, Harvard University, Yale University, New York Zoological Society, Carnegie Institution of Washington, University of Chicago and the American Museum of Natural History. Northwestern University will resubscribe for 1938, and also the University of Michigan.