tions of these subjects in Brazil (and elsewhere) during his lifetime. Rodolpho essentially was educated by studying at the side of his father, Hermann von Ihering, a physician–natural-historian immigrant from Germany. Hermann von Ihering was an important and innovative Brazilian biologist, founder in 1895 of the Museu Paulista in São Paulo and its director for the next 22 years. Rodolpho was raised in a tradition of work, ambition, social consciousness, and scientific intellectual curiosity, with a special interest and experience in the natural-history sciences. By 1903 Rodolpho was publishing his first papers in entomology on wasps and bees. From 1905 to 1907 he was in Europe, mainly in Heidelberg, to extend his education. From entomology his interests and publications spread over many fields of Brazilian natural history, especially ichthyology and ecology, but also herpetology and ornithology. Owing to the intense feeling against Germans during World War I in Brazil, Hermann von Ihering was forced to retire from the Museu Paulista. In sympathy, Rodolpho also left the museum. Rodolpho left biology altogether for the next ten years and established a small manufacturing business. He did, however, continue to publish popular articles and booklets on natural history, especially for schoolchildren. He also continued his interest in biology, particularly its application in improving the lives of his countrymen.

In 1926, through the encouragement of Laurindo Travassos and other Brazilian biologists, Rodolpho was persuaded to return to biology in the position of chief of the zoology section of the newly created Biological Institute in São Paulo. In 1932 he was given charge of the Technical Commission for Fish Culture of the Northeast, and in 1937 he became chief of the National Fisheries Service. It was during this period, 1926 through 1939, that his greatest contributions to Brazilian biology were made.

Von Ihering had always favored the use of Brazil's abundant native fish fauna for development of freshwater fisheries in association with the establishment of artificial reservoirs in the drought-stricken areas of northeastern Brazil, rather than the introduction into the natural fishery of carp and other foreign fishes that alter the habitat. However, artificial propagation (and thus the maintenance of adequate supplies) of native migratory freshwater fishes had so far been unsuccessful. Between 1934 and 1935 von Ihering and his co-workers developed a method for inducing spawning in captive freshwater fishes through the use of fish pituitary gland extract. This allowed the introduction of adequate supplies of native fishes into the reservoirs and became a model for the solution of similar problems in other parts of the world.

It is not just the specific scientific contributions made by Rodolpho von Ihering, however, that are important to the natural-history sciences in Brazil. Rather, it is the legacy of an attitude toward science and scientific progress and his advocacy of a blend of conservation with land and water use. Brazilian natural historians and scientists are to be commended for honoring this Brazilian pioneer of their science.

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Avian Architecture

Nest Building and Bird Behavior. NICHOLAS E. COLLIAS and ELSIE C. COLLIAS. Princeton University Press, Princeton, N.J., 1984. xx, 337 pp., illus. $45; paper, $16.50.

Nicholas and Elsie Collias are well known to ornithologists everywhere for their years of devotion to nest-building behavior in weaverbirds, master builders of the most highly evolved nests known among vertebrates. Now they have given us a comprehensive picture of nests and nest-building in all birds, analyzed from an evolutionary perspective. No other study of its kind exists. This is a work of fine scholarship that gives insight into the selective forces involved in the evolution of the diverse array of nest types, ranging from a simple depression on the bare ground through excavated cavity nests, open cup-shaped nests, domed nests, and woven nests to the elaborate avian apartments built by the most social of the weaverbirds.

The Collias approach starts with prolonged and detailed field observations, but includes careful experimentation with captive birds in large aviaries. They have succeeded in providing a convincing picture of the general evolution of bird nests, detailed analysis of adaptive radiation and the selective forces involved in their own special group, the weaverbirds, and also an account of the ontogeny of nest-building. In a nutshell, the general picture is that the entire process is genetically programmed, but the expression of the behavior requires access to appropriate environmental stimuli at appropriate stages of the bird's life. Not surprisingly, within the range of nest-building expertise shown by different individuals of species building complex nests, the most skilled performers are usually also the most experienced.

Not all structures built by birds are receptacles for eggs. Bowerbirds of the Australian region build beautiful structures of twigs, often decorated with flowers, berries, bright stones, bottle caps, and the like, to facilitate courtship and mating. Other birds build nests for roosting. Some build decoy nests or nest compartments to deceive predators. All of this and much more gets careful attention from Collias and Collias as they summarize the vast literature on birds' nests. The book concludes with two appendixes, one listing all bird families of the world and their nest types and the other telling where to find photographs of bird nests.

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