SECTION OF BIOLOGY

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PROFESSOR E. R. DUNN, Haverford College: *Some Aspects of Herpetology in Lower Central America.* (This lecture was illustrated by lantern slides.)

The herpetological fauna of Nicaragua, Costa Rica, and Panama is very rich, consisting as it does of 7 orders, 26 families, 124 genera, and 375 distinguishable forms. Almost the entire fauna can be found in the area between the Canal Zone and the Costa Rica-Nicaragua border. Nicaragua has only 4 genera and 24 species which do not occur in Costa Rica, and Darien has only 6 genera and 28 species which are not found in the Canal Zone to the west. The important barrier is the mountain mass on the Panama-Costa Rica border, and therefore Costa Rica and western Panama together have a fauna richer in families and genera than the areas immediately to the north and south. There are no endemic families in the central area and only one endemic genus, but no less than 157 species are endemic. I cannot as yet account for this richness in species, nor for the amount of specific endemism.

The fauna of the Pacific side savanna country has affinities with that of the Caribbean coast of South America, which likewise has a marked dry season. The fauna of the Atlantic side rain-forest has affinities with that of the Pacific coast rain-forest of Colombia. There is thus a faunistic crossing over in the Canal Zone and in Darien.

The fauna of the adjacent islands is a depauperate mainland one. The fauna of the Greater Antilles is likewise depauperate as compared to that of the mainland. Two orders, 10 families, and 100 genera are not represented there. This marked decrease is thought to be evidence against former land connection. About half the Greater Antillean fauna may be derived from that of the opposite mainland of northern Central America and Mexico. About a quarter of the

fauna is derivable from forms which now reach their northern limit in Panama or in Costa Rica. The remainder cannot be derived from any forms now in North America. This is thought to indicate a considerable southward movement of the mainland fauna.

In Lower Central America the climatic and botanical areas are wet tropics (rain-forest), wet and dry tropics (monsoon forest, savanna), and wet temperate (fog-forest). Ecologically, there are two terrains in the tropical forested regions. One includes the baseleveled regions on the flood plains of the larger rivers; the other is the hilly or mountainous country not yet reduced to base level. In the former, there is some open country along the streams and much still water. In the latter, there is little open country and the processes of erosion in the humid tropics produce very steep slopes and gully formation down to bed rock. There is, therefore, very little still water and the ravines are not safe habitats for aquatic animals. In these areas there are no water snakes and frogs have adopted many methods of avoiding water in the early stages of their life histories. This ecological analysis is believed to be true for the forested tropics in general. There seems no good evidence for an amphibian or reptile fauna restricted to the higher levels of the trees.

Study of some 9,500 snakes from four Panamanian areas, collected at random for census purposes, indicates that the dominate snake species differ from area to area, although the areas may have similar conditions and a similar list of snake species. In each area a few forms are abundant and the rest are rare. Roughly, 10% of the species make up half the population; while half of the species make up 5% of the population. This situation has been found to characterize all snake faunas examined (in other tropical areas, San Diego Co., Cal., and Eastern United States). A species may be generally abundant without being dominant anywhere; it may be dominant in one area and extremely rare everywhere else; but there is some correlation between dominance and wideness of range. Data over a series of years show fluctuations as well as steady increases in some species, and steady decreases in others.

The data from these snakes indicate that there is no correlation between number of species in a group and abundance of individuals of that group in nature.