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Relations of Living and Extinct Faunas: Volume 2

Alfred Russel Wallace

Excerpt

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THE
GEOGRAPHICAL DISTRIBUTION
OF ANIMALS.

PART III. (*continued.*)

ZOOLOGICAL GEOGRAPHY:

*A REVIEW OF THE CHIEF FORMS OF ANIMAL LIFE IN THE
SEVERAL REGIONS AND SUB-REGIONS, WITH THE INDICA-
TIONS THEY AFFORD OF GEOGRAPHICAL MUTATIONS.*

VOL. II.

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NEOTROPICAL REGION

Scale 1 inch=1000 miles



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CHAPTER XIV.

THE NEOTROPICAL REGION.

THIS region, comprehending not only South America but Tropical North America and the Antilles, may be compared as to extent with the Ethiopian region ; but it is distinguished from all the other great zoological divisions of the globe, by the small proportion of its surface occupied by deserts, by the large proportion of its lowlands, and by the altogether unequalled extent and luxuriance of its tropical forests. It further possesses a grand mountain range, rivalling the Himalayas in altitude and far surpassing them in extent, and which, being wholly situated within the region and running through eighty degrees of latitude, offers a variety of conditions and an extent of mountain slopes, of lofty plateaus and of deep valleys, which no other tropical region can approach. It has a further advantage in a southward prolongation far into the temperate zone, equivalent to a still greater extension of its lofty plateaus ; and this has, no doubt, aided the development of the peculiar alpine forms of life which abound in the southern Andes. The climate of this region is exceptionally favourable. Owing to the lofty mountain range situated along its western margin, the moisture-laden trade winds from the Atlantic have free access to the interior. A sufficient proportion of this moisture reaches the higher slopes of the Andes, where its condensation gives rise to innumerable streams, which cut deep ravines and carry down such an amount of sediment, that they have formed the vast plains of the Amazon, of Para-

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guay, and of the Orinooko out of what were once, no doubt, arms of the sea, separating the large islands of Guiana, Brazil, and the Andes. From these concurrent favourable conditions, there has resulted that inexhaustible variety of generic and specific forms with a somewhat limited range of family and ordinal types, which characterise neotropical zoology to a degree nowhere else to be met with.

Together with this variety and richness, there is a remarkable uniformity of animal life over all the tropical continental portions of the region, so that its division into sub-regions is a matter of some difficulty. There is, however, no doubt about separating the West Indian islands as forming a well-marked subdivision; characterised, not only by that poverty of forms which is a general feature of ancient insular groups, but also by a number of peculiar generic types, some of which are quite foreign to the remainder of the region. We must exclude, however, the islands of Trinidad, Tobago, and a few other small islands near the coast, which zoologically form a part of the main land. Again, the South Temperate portion of the continent, together with the high plateaus of the Andes to near the equator, form a well-marked subdivision, characterised by a peculiar fauna, very distinct both positively and negatively from that of the tropical lowland districts. The rest of Tropical South America is so homogeneous in its forms of life that it cannot be conveniently subdivided for the purposes of a work like the present. There are, no doubt, considerable differences in various parts of its vast area, due partly to its having been once separated into three or more islands, in part to existing diversities of physical conditions; and more exact knowledge may enable us to form several provinces or perhaps additional sub-regions. A large proportion of the genera, however, when sufficiently numerous in species, range over almost the whole extent of this sub-region wherever the conditions are favourable. Even the Andes do not seem to form such a barrier as has been supposed. North of the equator, where its western slopes are moist and forest-clad, most of the genera are found on both sides. To the south of this line its western valleys are arid and its lower plains almost deserts; and thus the absence of a

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number of groups to which verdant forests are essential, can be traced to the unsuitable conditions rather than to the existence of the mountain barrier. All Tropical South America, therefore, is here considered to form but one sub-region.

The portion of North America that lies within the tropics, closely resembles the last sub-region in general zoological features. It possesses hardly any positive distinctions; but there are several of a negative character, many important groups being wholly confined to South America. On the other hand many genera range into Mexico and Guatemala from the north, which never reach South America; so that it is convenient to separate this district as a sub-region, which forms, to some extent, a transition to the Nearctic region.

General Zoological Features of the Neotropical Region.—Richness combined with isolation is the predominant feature of Neotropical zoology, and no other region can approach it in the number of its peculiar family and generic types. It has eight families of Mammalia absolutely confined to it, besides several others which are rare elsewhere. These consist of two families of monkeys, Cebidæ and Hapalidæ, both abounding in genera and species; the Phyllostomidæ, or blood-sucking bats; Chinchillidæ and Caviidæ among rodents; besides the greater part of the Octodontidæ, Echimyidæ and Cercolabidæ. Among edentata, it has Bradypodidæ, or sloths, Dasypodidæ, or armadillos, and Myrmecophagidæ, or anteaters, constituting nearly the entire order; while Procyonidæ, belonging to the carnivora, and Didelphyidæ, a family of marsupials, only extend into the Nearctic region. It has also many peculiar groups of carnivora and of Muridæ, making a total of full a hundred genera confined to the region. Hardly less remarkable is the absence of many wide-spread groups. With the exception of one genus in the West Indian islands and a *Sorex* which reaches Guatemala and Costa Rica, the Insectivora are wholly wanting; as is also the extensive and wide-spread family of the Viverridæ. It has no oxen or sheep, and indeed no form of ruminant except deer and llamas; neither do its vast forests and grassy plains support a single form of non-ruminant ungulate, except the tapir and the peccary.

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Birds.—In birds, the Neotropical region is even richer and more isolated. It possesses no less than 23 families wholly confined within its limits, with 7 others which only extend into the Nearctic region. The names of the peculiar families are: Cærebidæ, or sugar-birds; Phytotomidæ, or plant-cutters; Pipridæ, or manakins; Cotingidæ, or chatterers; Formicariidæ, or ant-thrushes; Dendrocolaptidæ, or tree-creepers; Pteroptochidæ; Rhamphastidæ, or toucans; Bucconidæ, or puff-birds; Galbulidæ, or jacamas; Todidæ, or todies; Momotidæ, or motmots; Steatornithidæ, the guacharo, or oil-bird; Cracidæ, or curassows; Tinamidæ, or tinamous; Opisthocomidæ, the hoazin; Thinocoridæ; Cariamidæ; Aramidæ; Psophiidæ, or trumpeters; Eurypygidæ, or sun-bitterns; and Palamedeidæ, or horned-screamers. The seven which it possesses in common with North America are: Vireonidæ, or greenlets; Mniotiltidæ, or wood-warblers; Tanagridæ, or tanagers; Icteridæ, or hang-nests; Tyrannidæ, or tyrant-shrikes; Trochilidæ, or humming-birds; and Conuridæ, or macaws. Most of these families abound in genera and species, and many are of immense extent; such as Trochilidæ, with 115 genera, and nearly 400 species; Tyrannidæ, with more than 60 genera and nearly 300 species; Tanagridæ, with 43 genera and 300 species; Dendrocolaptidæ with 43 genera and more than 200 species; and many other very large groups. There are nearly 600 genera peculiar to the Neotropical region; but in using this number as a basis of comparison with other regions we must remember, that owing to several ornithologists having made the birds of South America a special study, they have perhaps been more minutely subdivided than in the case of other entire tropical regions.

Distinctive Characters of Neotropical Mammalia.—It is important also to consider the kind and amount of difference between the various animal forms of this region and of the Old World. To begin with the Quadrumana, all the larger American monkeys (Cebidæ) differ from every Old World group in the possession of an additional molar tooth in each jaw; and it is in this group alone that the tail is developed into a prehensile organ of wonderful power, adapting the animals to a purely arboreal life. Four of the genera, comprising more than half the

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species, have the prehensile tail, the remainder having this organ either short, or lax as in the Old World monkeys. Other differences from Old World apes, are the possession of a broad nasal septum, and a less opposable thumb; and the absence of cheek-pouches, ischial callosities, and a bony ear-tube. The Hapalidæ, or marmozets, agree with the Cebidæ in all these characters, but have others in addition which still more widely separate them from the Simiidæ; such as an additional premolar tooth, acute claws, and thumb not at all opposable; so that the whole group of American monkeys are radically different from the remainder of the order.

The Procyonidæ are a distinct family of Carnivora, which make up for the scarcity of Mustelidæ in South America. The Suidæ are represented by the very distinct genus *Dicotyles* (Peccary) forming a separate sub-family, and differing from all other genera in their dentition, the absence of tail and of one of the toes of the hind feet, the possession of a dorsal gland, and only two mammæ. The rodents are represented by the Chinchillidæ and Caviidæ, the latter comprising the largest animals in the order. The Edentata are almost wholly confined to this region; and the three families of the sloths (Bradypodidæ), armadillos (Dasypodidæ), and ant-eaters (Myrmecophagidæ), are widely separated in structure from any Old World animals. Lastly, we have the opossums (Didelphyidæ), a family of marsupials, but having no close affinity to any of the numerous Australian forms of that order. We have already arrived at the conclusion that the presence of marsupials in South America is not due to any direct transference from Australia, but that their introduction is comparatively recent, and that they came from the Old World by way of North America (vol. i., p. 155). But the numerous and deep-seated peculiarities of many other of its mammalia, would indicate a very remote origin; and a long-continued isolation of South America from the rest of the world is required, in order to account for the preservation and development of so many distinct groups of comparatively low-type quadrupeds.

Distinctive Characters of Neotropical Birds.—The birds which are especially characteristic of this region, present similar distinctive features. In the enormous group of Passerine

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birds which, though comprising nearly three-fourths of the entire class, yet presents hardly any well-marked differences of structure by which it can be subdivided—the families confined to America are, for the most part, more closely related to each other than to the Old World groups. The ten families forming the group of “Formicaroid Passeres,” in our arrangement (vol. i., p. 94), are characterised by the absence of singing muscles in the larynx, and also by an unusual development of the first primary quill; and seven of this series of families (which are considered to be less perfectly developed than the great mass of Old World passeres) are exclusively American, the three belonging to the Eastern hemisphere being of small extent. Another group of ten families—our “Tanagroïd Passeres,” are characterised by the abortion or very rudimentary condition of the first quill; and of these, five are exclusively American, and have numerous genera and species, while only two are non-American, and these are of small extent. On the other hand the “Turdoid Passeres,” consisting of 23 families and comprising all the true “singing-birds,” is poorly represented in America; no family being exclusively Neotropical, and only three being at all fully represented in South America, though they comprise the great mass of the Old World passeres. These peculiarities, which group together whole series of families of American birds, point to early separation and long isolation, no less surely than the more remarkable structural divergences presented by the Neotropical mammalia.

In the Picariæ, we have first, the toucans (*Rhamphastidæ*); an extraordinary and beautiful family, whose enormous gaily-coloured bills and long feathered tongues, separate them widely from all other birds. The *Galbulidæ* or jacamars, the motmots (*Momotidæ*), and the curious little todies (*Todidæ*) of the Antilles, are also isolated groups. But most remarkable of all is the wonderful family of the humming-birds, which ranges over all America from Tierra del Fuego to Sitka, and from the level plains of the Amazon to above the snow-line on the Andes; which abounds both in genera, species, and individuals, and is yet strictly confined to this continent alone! How vast must have been the time required to develop those beautiful and

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highly specialized forms out of some ancestral swift-like type; how complete and long continued the isolation of their birth-place to have allowed of their modification and adaptation to such divergent climates and conditions, yet never to have permitted them to establish themselves in the other continents. No naturalist can study in detail this single family of birds, without being profoundly impressed with the vast antiquity of the South American continent, its long isolation from the rest of the land surface of the globe, and the persistence through countless ages of all the conditions requisite for the development and increase of varied forms of animal life.

Passing on to the parrot tribe, we find the peculiar family of the Conuridæ, of which the macaws are the highest development, very largely represented. It is in the gallinaceous birds however that we again meet with wholly isolated groups. The Cracidæ, including the curassows and guans, have no immediate relations with any of the Old World families. Professor Huxley considers them to approach nearest to (though still very remote from) the Australian megapodes; and here, as in the case of the marsupials, we probably have divergent modifications of an ancient type once widely distributed, not a direct communication between the southern continents. The Tinamidæ or tinamous, point to a still more remote antiquity, since their nearest allies are believed to be the Struthionæ or ostrich tribe, of which a few representatives are scattered widely over the globe. The hoazin of Guiana (*Opisthocomus*) is another isolated form, not only the type of a family, but perhaps of an extinct order of birds. Passing on to the waders, we have a number of peculiar family types, all indicative of antiquity and isolation. The *Cariama* of the plains of Brazil, a bird somewhat intermediate between a bustard and a hawk, is one of these; the elegant *Psophia* or trumpeter of the Amazonian forests; the beautiful little sun-bittern of the river banks (*Eurypyga*); and the horned screamers (*Palamedea*), all form distinct and isolated families of birds, to which the Old World offers nothing directly comparable.

Reptiles.—The Neotropical region is very rich in varied forms of reptile life, and the species are very abundant. It has six

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altogether peculiar families, and several others which only range into the Nearctic region, as well as a very large number of peculiar or characteristic genera. As the orders of reptiles differ considerably in their distributional features, they must be considered separately.

The snakes (Ophidia) differ from all other reptiles, and from most other orders of vertebrates, in the wide average distribution of the families; so that such an isolated region as the Neotropical possesses no peculiar family, nor even one confined to the American continent. The families of most restricted range are—the Scytalidæ, only found elsewhere in the Philippine islands; the Amblycephalidæ, common to the Oriental and Neotropical regions; and the Tortricidæ, most abundant in the Oriental region, but found also in the Austro-Malay islands and Tropical South America. Sixteen of the families of snakes occur in the region, the Colubridæ, Amblycephalidæ, and Pythonidæ, being those which are best represented by peculiar forms. There are 25 peculiar or characteristic genera, the most important being *Dromicus* (Colubridæ); *Boa*, *Epicrates*, and *Ungalia* (Pythonidæ); *Elaps* (Elapidæ); and *Craspedocephalus* (Crotalidæ).

The lizards (Lacertilia) are generally more restricted in their range; hence we find that out of 15 families which inhabit the region, 5 are altogether peculiar, and 4 more extend only to N. America. The peculiar families are Helodermidæ, Anadiadæ, Chirocolidæ, Iphisidæ, and Cercosauridæ; but it must be noted that these all possess but a single genus each, and only two of them (Chirocolidæ and Cercosauridæ) have more than a single species. The families which range over both South and North America are Chirotidæ, Chalcidæ, Teidæ, and Iguanidæ, the first and second are of small extent, but the other two are very large groups, the Teidæ possessing 12 genera and near 80 species; the Iguanidæ 40 genera and near 150 species; the greater part of which are Neotropical. There are more than 50 peculiar or highly characteristic genera of lizards, about 40 of which belong to the Teidæ and Iguanidæ, which thus especially characterize the region. The most important and characteristic genera are the following: *Ameiva* (Teidæ); *Gymnophthalmus* (Gymnophthalmidæ);