2. Note on the Derivation and Distribution of the Insectivora of the New World. By G. E. Dobson, M.A., F.R.S.

[Received April 24, 1891.]

Of the ten Families into which the Insectivora are divisible, two only[1], and these very closely allied, namely *Soricidæ* and *Talpidæ*, are represented in the New World, and of the first-named family, composed of eleven genera, three genera only—*Sorex*, *Blarina*, and *Notiosorex* (with a single species)—have representatives in that continent, where all are restricted to the Nearctic Region. On the other hand, the closely connected Palæarctic Region includes representatives of no less than eight genera, nearly four-fifths of the whole. All the species of the two genera inhabiting the American continent belong to the Red-toothed Shrews, and are, in fact, modified forms of either *Sorex* or of *Soriculus*, the former common to both the Palæarctic and Nearctic Regions, the latter found only in a limited portion of the north-eastern parts of the Eastern Hemisphere, but represented in the Nearctic Region by the species of *Blarina*.

While the species of *Blarina* are characteristic of the Nearctic Region, those of *Sorex* are, with few exceptions, closely related one to another, so much so as to be, in my opinion, Nearctic local races only of two well-known Palæarctic species, namely *S. vulgaris* and *S. minutus* (=*S. pygmæus*), of which the former extends to North America, and the latter is represented there by its but slightly modified descendant *S. personatus* (=*S. cooperi*) and its varieties.

The Nearctic Shrews were therefore evidently derived from the Palæarctic Region, having migrated from thence probably at a comparatively recent period, if we may judge from the fact that the Water-Shrews of the New World are still referable to the genus *Sorex*, the changes in their bodily structure due to their altered mode of life not having yet advanced nearly so far as we find in the much more highly specialized Water-Shrews (*Crossopus*) of the Old World.

Assuming then, as I believe we are entitled to from a consideration of the above-mentioned facts, that the American Shrews were derived from the Palæarctic Region, it is only reasonable to suppose that the immigration took place by the shortest route, namely, from west to east. The total absence of the White-toothed Shrews from the Nearctic Region goes far to prove that the place of entrance of the ancestors of the American Shrews from the Asiatic continent must have occurred at some position north of N. lat. 50°, for one species at least of the genus *Crocidura* extends as far north as the region of the Ussuri river[2]. However, there is no difficulty in supposing that the entrance took place in the latitude of Behring's

[1] Not taking into account the *Solenodontidæ*, the species of which are limited to the islands Cuba and Hayti.

[2] A tributary of the Amur River, in E. Manchuria.

Strait at a time when the continents were united at that point, for I have examined specimens of *Sorex vulgaris* and of *S. minutus* from higher latitudes, namely, from the banks of the Khatanga and of the Olenek rivers within the Arctic Circle.

The Red-toothed Shrews are, in fact, pre-eminently boreal in their distribution, braving the most rigorous climates of the northern parts of both hemispheres, and thinning out quickly, to finally disappear altogether as we advance south. Their limit appears to be a climatic rather than a territorial one: thus their southern extent in the Palæarctic Region may be very correctly stated to be bounded by the isothermal of 60° Fahr.; the few exceptions noticeable, such as the presence of species of *Soriculus* south of this line on the southern slopes of the Himalayas, being easily accounted for by the fact that these animals are rarely found there at a lower elevation than 6000 feet, where they enjoy a really temperate climate. This explains how it happens that Shrews are wholly absent from South America. Two species only are found in Central America, where they extend as far south as Costa Rica, being, like the species of *Soriculus* [1], stragglers from the north along the high mountains and elevated table-lands, and therefore enjoying, like them, a comparatively temperate climate, their further advance southward being evidently prevented by the long depression which separates the mountains and elevated plateau of Costa Rica from the Andes, and not by the competition of other animals in the Neotropical Region, as writers on geographical distribution would have us believe. The high temperature of the Isthmus of Panama has, in fact, proved as effectual a barrier to these inhabitants of a boreal zone as the low temperature of the ancient northern isthmus between Asia and America was of old to the sun-loving White-toothed Shrews. There cannot be the least doubt that had a sufficient number of individuals of any of the species of White-toothed Shrews effected an entrance into North America, they would speedily have found their way into the southern part of that continent and thence into South America, and have continued to exist and multiply there.

Similar remarks apply to the *Talpidæ*, the species of which are, like those of the Red-toothed Shrews, restricted to the temperate and sub-boreal zones of the Northern Hemisphere, the instances in which there appears to be an exception to this rule, as in the case of two species which are found on the southern slopes and spurs of the Himalayas, being accounted for by the high elevation of the districts which they inhabit. Of the seventeen known species, four only are found in the New World, and these have much the same distribution as the Red-toothed *Soricidæ*, the chief difference noticeable being that none have been found as yet north of the southern parts of the shores of Hudson's Bay nor to the south of Mexico, the high tem-

[1] These have hitherto been supposed to be limited to the southern slopes of the Himalayas; but I have recently discovered, in the collection of the Paris Museum, a specimen of *Soriculus caudatus* from the mountains of Western Fo-Kien, China, so that it is probable that this genus has really its head-quarters in countries to the north and north-east of the Himalayas.

perature of Central America proving, in their case, even a more effectual barrier to their progress southward than with the Red-toothed *Soricidæ*, examples of which, as we have seen, extend as far as Costa Rica. Looking at the small number of American species, and taking into consideration the fact that, while it is possible to imagine the highly differentiated New-World Moles as capable of being derived by modification from a common progenitor resembling those of the genus *Talpa*, the reverse being unimaginable, it follows that they, like the species of *Soricidæ*, were also most probably derived from the Palæarctic Region, whence their ancestor or ancestors found their way into North America by the same route as the Red-toothed Shrews. The close relationship existing between *Urotrichus* (*Neürotrichus*) *gibbsi*, from the Pacific slopes of the Rocky Mountains, and *Urotrichus talpoides* of Japan, points indubitably to a common ancestor for these species at least, and their limitation to the opposite shores of the same ocean to the route by which the parent form entered the New World.

3. On Reptiles, Batrachians, and Fishes from the Lesser West Indies. By G. A. Boulenger.

[Received May 15, 1891.]

A first report on the Reptiles and Batrachians collected for the West Indies Exploration Committee was published in 1888 [1] by Dr. Günther, dealing with collections made by Mr. Ramage in the Island of Dominica. A list of the Reptiles of Barbados was published by Col. Feilden in 1889 [2]. The present contribution deals with further collections received from Dominica (collectors Mr. G. A. Ramage and Dr. H. A. A. Nicholls, C.M.Z.S.), St. Lucia (Ramage), and St. Vincent, Becquia and Moustiques (collected by Mr. H. H. Smith and presented to the British Museum by Mr. F. D. Godman).

I. Dominica.

The following species are additions to Dr. Günther's list.

1. Hemidactylus mabouia, Mor.

2. Sphærodactylus microlepis, R. & L.

Snout pointed, as long as the distance between the eye and the ear-opening, once and a half the diameter of the orbit; ear-opening small, oval, vertical. Rostral moderately large, with longitudinal cleft above; nostril pierced between the rostral, the first labial, and three scales; three upper labials; four lower labials, the first longer than the three others together; mental large, its posterior border truncate and in contact with two scales. A small spine-like scale on the upper eyelid, above the middle of the eye. All the scales on

[1] Ann. & Mag. N. H. (6) ii. pp. 362–366.
[2] Zoologist, (3) xiii. pp. 295–298, 352 & 353.