

of the Gulf States, variously dotted and cut into by intrusive branches of the neighbouring faunas from either side, especially in the broken country of the west.

The opossum is perhaps the most distinctive of the mammals of the zone and among birds we have the yellow-breasted chat, mockingbird, Carolina wren, Carolina chickadee, orchard oriole, barn owl, a number of distinctive southern warblers and some southern subspecific forms allied to more northern variations.

These make the latitudinal or thermal divisions of our faunal life. Outside of the species mentioned are numerous forms that extend over the whole area, but show in different zones variations recognizable only to the expert. A good example is the hairy woodpecker. This bird breeds over all the wooded parts of North America, but the birds from the Lower Austral zone are quite separable by the trained eye from those of the Upper Austral and Transition and these from the large northern form of the Hudsonian. This is but one case of many where a northern and a southern race exist in the same species which are designated as subspecies. Some of these geographical races are so slightly differentiated as to require an expert to separate them while others are marked and striking. The critical difference between a full species and a subspecies is the fact that the latter intergrade and blend into each other gradually. With species the break between is sudden, and intermediates do not occur.

Further Divisions.—With this zonal distribution and a variation of life groups depending basically upon temperature, we have another system of distribution from east to west, depending largely upon physical conditions of habitat—the arrangement of land and water or mountain ranges forming barriers or highways of migration and leading certain forms in certain directions while barring them from others—and the comparative rainfall and humidity of climate. This has a primary direct influence upon such forms of life, as well as a secondary and indirect one through the plants and insects which give them food or shelter.

The principal east and west division is made by the Rocky mountains, which successfully cut off the Pacific coast from close contact with eastern forms. The Rocky mountain system approximates the dividing line of the east and west faunas, leaving a triangular patch to the west including British Columbia, southern Yukon and southern Alaska as the western or mountain fauna, and cutting through the Transition, Canadian and Hudsonian transcontinental zones.

The mountain district is characterized by an abundant rainfall, a high average humidity and a greatly diversified and rugged topography, forming a succession of parallel mountain ranges and valleys which facilitate intercommunication in a north and south direction, while obstructing it from east to west. These topographical conditions continue to the south well into Mexico and enforce migration routes and conditions and associations more or less isolated. The marked humidity of the climate, especially near the coast, also causes or encourages special physiological changes in numerous organisms tending as a rule to produce larger size and richer colouration. These differences in physical conditions and the isolation formed by the barrier mountains have produced a great number of forms peculiar to the district. In fact, comparatively few species, either of birds or animals, extend across the mountains from the east unmodified, and the native population can be divided into three heads: subspecific variations of eastern forms, species confined to the area and forms of evident mountain origin but spreading from them a certain distance eastward.

Typical amongst the first may be mentioned the moose and woodland caribou, the Oregon subspecies of the ruffed grouse, Harris' Rocky-mountain and Gairdner's