

## 8. PISCES: by C. T. REGAN.

The Introductory remarks to this subject (published in 1908) are arranged by the author under five headings:—(1) Principal Faunal Works on the Fresh-water Fishes of Mexico and Central America; (2) Principal Collections described in this Work; (3) Classification; (4) Geographical Distribution, illustrated by two separate maps; (5) The Shore-Fishes of the Atlantic and Pacific Coasts of Mexico and Central America. The geographical distribution is discussed at length under the headings to the separate families, ten of which are represented in the region, that of the Cichlidæ, Percidæ, Characinidæ, Catostominæ, and Cyprininae being illustrated by shaded maps in the text. The author considers that the Nearctic and Neotropical Regions are quite distinct, and to explain the distribution of fresh-water fishes he says that the volcanic chain of mountains which stretches across Mexico from Colima nearly to Vera Cruz may be taken as the boundary. The Nearctic Region he divides into three subregions, one of which, the "Lerma," lies wholly within Mexican territory. The Neotropical Region is also divided into three subregions, the Central-American subregion again being separated into four "provinces," Balsas, Guatemalan, San Juan, and Isthmian; the limits of these are shown on Map 2.

Mr. Regan says that the Cichlidæ, which form a very large family of fresh-water fishes, is the dominant perciform group in Tropical America and Africa. In America the Cichlidæ extend from Texas to Argentina, and comprise about 150 species. Africa appears to be somewhat richer in both genera and species, whilst three representatives occur in India and Ceylon. A map is given in the text to show this distribution. He states that the Mexican and Central American Cichlids must have originated in the Southern Continent.

The Percidæ are fresh-water fish inhabiting Europe, Northern Asia, North America east of the Rocky Mountains, and Northern Mexico. Fossil Percidæ are found in the Eocene deposits of Wyoming.

The distribution of the Characinidæ, also fresh-water fish, is equally interesting. They extend from Northern Mexico over all the South-American continent, except the extreme south, and are found also in Africa, but not in Madagascar.

These two families and the Lepidosirenidæ support the theory that a land connection between South America and Africa may have persisted until the beginning of the Tertiary period.

The Catostominæ extend from Guatemala all over North America and into Eastern Asia.

The Cyprininae are found from Canada southward to the Lerma Valley in Mexico and throughout Africa and Eurasia, except in the extreme north. They abound in Borneo, but are absent from Celebes.

Amongst the Shore-Fishes entering fresh water, eighteen Pacific coast species are specially noted as having a closely related representative on the Atlantic.