

## THE RIDDLE OF THE UNIVERSE

classes of the tetrapoda: (1) the *carpus*, (2) the *metacarpus*, (3) the five fingers (*digiti anteriores*); in the rear limb, similarly, we have always the same three osseous groups of the hind foot: (1) the *tarsus*, (2) the *metatarsus*, and (3) the five toes (*digiti posteriores*). It was a very difficult task to reduce all these little bones to one primitive type, and to establish the equivalence (or homology) of the separate parts in all cases; they present extreme variations of form and construction in detail, sometimes being partly fused together and losing their individuality. This great task was first successfully achieved by the most eminent comparative anatomist of our day, Karl Gegenbaur. He pointed out, in his *Researches into the Comparative Anatomy of the Vertebrata* (1864), how this characteristic "five-toed leg" of the land tetrapods originally (not before the Carboniferous period) arose out of the radiating fin (the breast-fin, or the belly-fin) of the ancient fishes. He had also, in his famous *Researches into the Skull of the Vertebrata* (1872), deduced the younger skull of the tetrapods from the oldest cranial form among the fishes, that of the shark.

It is especially remarkable that the original number of the toes (five) on each of the four feet, which first appeared in the old amphibia of the Carboniferous period, has, in virtue of a strict heredity, been preserved even to the present day in man. Also, naturally and harmoniously, the typical construction of the joints, ligaments, muscles, and nerves of the two pairs of legs has, in the main, remained the same as in the rest of the "four-footed." In all these important relations *man is a true tetrapod*.

The mammals are the youngest and most advanced class of the vertebrates. It is true they are derived