

and the modern sharks have no swim-bladders. Possibly, however, the sharks habitually haunted the open sea, and only made occasional raids on the dangerous waters tenanted by the ganoids. It is also true that only certain genera of sharks are found to be represented in the carbonaceous shales, and they may have differed in this respect from the ordinary forms of the order. It has been suggested that only a small change would be necessary to enable some of these lung fishes to become Batrachians, and no doubt this is the nearest approach of the fish to the reptile ; but we have not yet found connecting links sufficient to bridge over the whole distance.

The plate-bearing ganoids of the Silurian and Devonian, at one time supposed to be allied to Crustaceans, but whose dignity as "Forerunners of the back-boned animals" is now generally admitted,¹ are clearly true fishes, and of somewhat high rank, their strange bony armour being evidently a special protection against the attacks of contemporary sharks and gigantic crustaceans ; and if we may judge by the Colorado specimens, their existence dates back almost to the close of the Cambrian, and they were probably contemporary with small sharks ; while as early as the Silurian and Devonian, if we regard the scaly ganoids as a distinct type, we have already four types of fishes, and these akin to those which in modern time we must regard as the highest of their class.

One very little fish of the Devonian, of which specimens have been kindly sent me by a friend in Scotland,² the Palæo-

¹ A. Smith Woodward, "Natural Science," 1892, and *Annals and Maga. Nat. Hist.*, October, 1890. This able naturalist, in introducing his subject, remarks, from the point of view of an evolutionist:—"Whether some form of 'worm' gave origin to the forerunners of the great back-boned race, or whether a primeval relative of the King-crab turned upside down and rearranged limbs and head—these are questions still admitting of endless discussion, no doubt fruitless in their main object, but desirable from the new lines of investigation they continually suggest."

² James Reed, Esq., of Allan House, Blairgowrie.