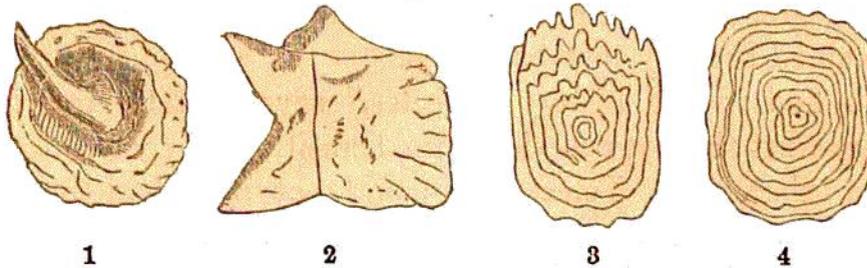


This eminent writer in his great work entitled, *Recherches sur les Poissons par L'Agassiz*, divided all fishes into four classes, distinguished by the character of their scales; the important discovery having been made by him, that there is such a relation between the form of the scale and the organization of the fish, that if those having similar scales be brought together, they will be found to correspond closely in their nature. The following are the forms of the scales in the four classes :

Fig. 221, No. 1, shows one of the enameled plates that belongs to the *Placoids* ; No. 2, the plates covered with enamel, identical in structure with the teeth, covering the *Ganoids* ; No. 3, the toothed or comb like scales of the *Ctenoids* ; and No. 4, the circular plates without enamel of the *Cycloids*.

Fig. 221.



From the classification of animals which we have given on a previous page, it would appear that Agassiz has given up the above arrangement. He will doubtless explain fully his new system in his great work on the Natural History of the United States. J. Muller, according to Pictet, had proposed desirable changes in the system founded upon the scales.

He proposes six classes : 1. The *Sirenoid* fishes, that have both lungs and gills ; 2. the *Teleosteans*, or fish with proper bones ; 3. the *Ganoids* ; 4. the *Elastombranchians*, or the *Placoids* of Agassiz ; 5. the *Cyclostomeans*, or cartilaginous fishes ; 6. the *Leptocardians*, or fishes without a heart, being only one genus. Of these the first, fifth, and sixth classes are not found fossil.

Naturalists have described 504 genera of fossil fishes, distributed as follows :

In the Upper Silurian . . . . .	7
In the Devonian . . . . .	56
In the Carboniferous . . . . .	70
In the Permian . . . . .	16
In the Trias . . . . .	23
In the Jurassic . . . . .	66
In the Cretaceous . . . . .	78
In the Tertiary . . . . .	188

Of all fossil animals the fishes cast the most light upon the laws of palæontology. In their different formations they are found to be separated from one another by the most distinct characters. Those of a particular formation seem to have been created for that formation only, and rarely do the genera extend beyond it as they do in most of the lower animals. Not a single genus below the chalk has survived to the present day, and above that point the number of extinct genera is quite large, amounting to two thirds of those in the chalk, and one third of those in the lower tertiary.