

with long and powerful spines, or, in a later age, with a fearful array of sharp and conical teeth. The dynasty of the fishes sprang up in that period when the limestones of Buffalo, in New York, and of Columbus, Sandusky, and Kelly's Island, in Ohio, were accumulating as sediments in the bottom of the sea; when Canada West was the ocean's bed, and the last crop of zoöphytes was growing upon it; when the beautiful island of Mackinac was a submarine plantation, and the embryo fastnesses of Old Fort Mackinac witnessed an onslaught and a massacre more bloody and destructive than that of 1761. The empire of the fishes waxed more powerful during the succeeding epochs, when the "black shales" of the West, and, later, the beautiful sandstones of Waverly and Cleveland, Ohio, were the ocean's bed, and hordes of marine forms roamed over the area of Southern New York, and nearly the whole of Michigan, Indiana, and Illinois. The Marshall epoch probably covers the latter part of the period of the Old Red Sandstone of Scotland, whose ichthyic populations have been so graphically described by the author of the "Asterolepis of Stromness."

The reign of the fishes was prolonged through the Carboniferous period; but the types which wielded the sceptre during the later ages of the empire assumed less questionable forms, and began to approach the external configuration of the fishes of our day. They were mostly clothed, however, with bony scales, and the backbone extended into the upper lobe of the tail, which was longer than the lower; or, what is probably a more correct view of this structure, the tail was supplied upon the under side with a supernumerary fin, the development of which deflected upward the true caudal fin—the tail of the sturgeon and the garpike being as truly "homocercal" as that of the whitefish. It is sad to think of the ancient populousness and prowess of