

south of Builth, where true passage-beds occur, the ordinary shells of the Upper Ludlow rocks become far less numerous, and are almost all of small size, including species of *Modiolopsis* and *Modiola*, *Lingula cornea*, *Platychisma helicites*, a small *Discina*, a small *Theca*, a few small Crustacea, of the genera *Leperditia*, *Cytherellina*, &c. The water was freshening and getting unfitted for marine life.

The remains of *Cephalaspis Lyellii* (fig. 26) are occasionally found all through the Old Red Sandstone of this large area. The absence of marine shells and the nature of the fossil fishes of the Old Red Sandstone long ago led Mr. Godwin-Austen to infer that the formation was deposited, not in the sea, as had always been asserted, but in a great fresh-water lake, or in a series of lakes. In this opinion I thoroughly agree, for the nearest living analogues of many of the fish are the *Polypterus* of the African rivers, the *Ceratodus* of Australia, and in less degree the *Lepidosteus* of North America. The red colour of the rocks also helps to the same conclusion. Each grain of sand and marl is red, because it is encrusted with a thin pellicle of peroxide of iron, which could not have been deposited from mere solution, as a crust enveloping *each grain of sand* at the bottom of a great open ocean; but if carbonate of iron were carried in solution into lakes, it might have been precipitated as a peroxide through the oxidising action of the air and the escape of the carbonic acid.¹

¹ There is no analogy between the coarse red sandstones and finer marls of the Old Red Sandstone, and the very fine red ooze dredged from the deeps of the South Atlantic. The latter is a residue produced by the decomposition of Foraminifera, and in no way resembles the coarse mechanical strata of Old Red Sandstone.