

Old Red Sandstone as classified by Murchison.	{	Upper.	Yellow and red sandstones and conglomerates: <i>Pterichthys major</i> , <i>Holoptychius nobilissimus</i> , etc. = Dura Den beds.
		Middle.	Gray and blue calcareous and bituminous flagstones, limestones, and red sandstones and conglomerates: <i>Dipterus</i> , <i>Osteolepis</i> , <i>Asterolepis</i> , <i>Acanthodes</i> , <i>Pterichthys</i> , etc. = Caithness flags.
		Lower.	Red and purple sandstones, gray sandy flagstones, and coarse conglomerates: <i>Cephalaspis</i> , <i>Pteraspis</i> , <i>Pterygotus</i> = Arbroath flags.

It is important to observe that in no district can these three subdivisions be found together, and that the so-called "middle" formation occurs only in one region—the north of Scotland. The classification, therefore, does not rest upon any actually ascertained stratigraphical sequence, but on an inference from the organic remains. The value of this inference will be estimated a little further on. All that can be affirmed from the stratigraphical evidence of any district in Britain is that a great physical and palæontological break can generally be traced in the Old Red Sandstone, dividing it into two completely distinct series.¹⁶²

As a whole, the Old Red Sandstone, where its strata are really red, is, like other masses of red deposits, singularly barren of organic remains. As above remarked, the physical conditions under which the precipitation of iron oxide took place are not easily explained. They were evidently unfavorable for the development of animal life in the same waters. Sir A. C. Ramsay has connected the occurrence of such red formations with the existence of salt lakes, from the bitter waters of which not only iron oxide but often rock-salt, magnesian limestone, and gypsum were thrown down.¹⁶³ He points also to the presence of land-plants, footprints of amphibia, and other indications of terrestrial surfaces, while truly marine organisms are either found in a stunted condition or are absent altogether. Where the strata of the Old Red Sandstone, losing their red color and ferruginous character, assume gray or yellow tints and pass into a calcareous or argillaceous condition, they not infrequently become fossiliferous. At the same time, it is worthy of remark that

¹⁶² Q. J. Geol. Soc. xviii. 1860, p. 312.

¹⁶³ Prof. Gosselet contends that the precipitation of iron might quite well have taken place in the sea, and he cites the case of the Devonian basin of Dinant, where the same beds are in one part red and barren of organic remains, and in another part of the same area are of the usual colors and are full of marine fossils. But the red color of the Old Red Sandstone is general, and is accompanied with other proofs of isolation in the basins of deposit (see p. 1314).