

nacanthus) appear both in Caithness and in Forfarshire. *Parexus incurvus* occurs in the northern as well as the southern basin. The admitted palæontological distinctions are probably not greater than the striking lithological differences between the strata of the two regions would account for, or than the contrast between the ichthyic faunas of adjacent but disconnected water-basins at the present time.

More than sixty species of fishes have been obtained from the Old Red Sandstone of the north of Scotland. Among these, the genera *Acanthodes*, *Asterolepis*, *Cheiracanthus*, *Cheirolepis*, *Coccosteus*, *Diplacanthus*, *Diplopterus*, *Dipterus*, *Glyptolepis*, *Osteolepis*, and *Pterichthys* are specially characteristic. Some of the shales are crowded with the little phyllopod crustacean *Estheria membranacea*. Land-plants abound, especially in the higher groups of the flagstones, where forms of *Psilophyton*, *Lepidodendron*, *Stigmaria*, *Sigillaria*, *Calamites*, and *Cyclopteris*, as well as other genera, occur. In the Shetland Islands, traces of abundant contemporaneous volcanic rocks have been observed.¹⁶⁸ These, with the exception of two trifling examples in the region of the Moray Firth, are the only known instances of volcanic action in the Lower Old Red Sandstone of Lake Orcadie. In the other two Scottish basins, those of the Cheviot Hills¹⁶⁹ and of Lorne,¹⁷⁰ volcanic action long continued vigorous, and produced thick piles of lava, like those of Lake Caledonia.

2. UPPER.—This division consists of yellow and red sandstones, conglomerates, marls, etc., passing up conformably into the base of the Carboniferous system, and resting unconformably on the Lower Old Red Sandstone and every older formation. Among its distinctive fossils are *Holoptychius*, *Bothriolepis* (*Pterichthys*) *major*, etc.

Below the Carboniferous system there occur in Scotland certain red sandstones, deep-red clays or marls, conglomerates, and breccias, the sandstones passing into yellow or even white. These strata, wherever their stratigraphical relations can be distinctly traced, lie unconformably upon every formation older than themselves, including the Lower

¹⁶⁸ *Trans. Roy. Soc. Edin.* xxviii. 1878, p. 345. Presidential Address, *Quart. Journ. Geol. Soc.* xlvi. 1892, p. 94. Peach and Horne, *Trans. Roy. Soc. Edin.* xxxii. 1884, p. 359.

¹⁶⁹ C. T. Clough, "Cheviot Hills," *Geol. Surv. Mem. Sheet 108 N.E.*, 1888; J. J. H. Teall, *Geol. Mag.* 1883.

¹⁷⁰ Presidential Address, *Quart. Journ. Geol. Soc.* xlvi. 1892, p. 95.