

always in our own knowledge, and not in the actual state of things. The next score of years will probably bring the matter to a pretty fair decision; for it seems impossible that, if so many able workers continue to be employed as industriously as now in the same field, the remains of man and the higher mammals will not be found to be of all periods, if at all periods they existed. In the meantime, it is well to know the actual point to which discovery has conducted us; and this I have taken every pains most carefully to ascertain.

The Upper Ludlow rocks,—the uppermost of the Silurians,—continue to be the lowest point at which fish are found. Up to that period,—during the vast ages of the Cambrian, where only the faintest traces of animal life have been detected<sup>1</sup> in the shape of annelides or sand-boring worms,—throughout the whole range of the Silurians, where shell-fish and crustaceans, with inferior forms of life, abounded,—no traces of fish, the lowest vertebrate existences until the latest formed beds of the Upper Silurian, have yet appeared. There are now six genera of fish ranked as Upper Silurian,—*Auchenaspis*, *Cephalaspis*, *Pteraspis*, *Plectrodus*, *Onchus Murchisoni*, and *Sphagodus*. The two latter,—*Onchus Murchisoni* and *Sphagodus*,—are represented by bony defences, such as are possessed by placoid fishes of the present day. Sir Roderick Murchison at one time entertained the idea of placing the Ludlow bone-bed at the base of the Old Red Sandstone; but its fish having been found decidedly associated with Silurian organisms, this idea has been abandoned.

<sup>1</sup> See the lately published edition of Sir Roderick I. Murchison's *Siluria*, chap. ii. p. 26.