it forms the base of the Upper Silurian formations. It is covered by a series of grits, flags, sandstones, mudstones, and shales, which in some places are at least 3000 feet thick. These are overlain by and pass laterally into hard shales, and are believed to represent the true Wenlock group, perhaps even some portion of the Ludlow rocks. The zone of Cyrtograptus Murchisoni which marks the lower part of the Wenlock group is found in Denbighshire, and gives a recognizable horizon. It is evident, however, that in spite of the wide extent over which these Upper Silurian rocks of North Wales are spread, and the great thickness which they attain, they do not present an adequate stratigraphical equivalent for the complete succession in the

Fig. 347.—Fossil scorpion (*Palæophoneus*), Upper Silurian, Lesmahagow, Lanarkshire (about twice nat. size). Drawn by Mr. B. N. Peach.

original Silurian district. Instead of passing up conformably into the base of the Old Red Sandstone, as at Ludlow, they are covered by that formation unconformably. In fact they have been upturned, crumpled, faulted, and cleaved before the deposition of those portions of the Old Red Sandstone (Upper) which lie upon them. These great physical changes took place in Denbighshire when, so far as the evidence goes, there was entire quiescence in the Shropshire district; yet the distance between the two areas was not more than about 60 miles. These subterranean movements were doubtless connected with those more widely extended upheavals that converted the floor of the Silurian sea into a series of isolated basins, in which the Old Red Sandstone was laid down.

In Westmoreland and Cumberland a vast mass