

has yielded such familiar Bala species as *Favosites fibrosa*, *Heliolites interstinctus*, *Cybele verrucosa*, *Leptæna sericea*, *Orthis Actoniæ*, *O. biforata*, *O. calligramma*, *O. elegantula*, *O. porcata*, and *Strophomena rhomboidalis*. These organisms and their associates, gathering on the submerged flanks of the sinking volcano, before the eruptions had finally ceased, formed there the bed of limestone which is now traceable for many miles through the Westmoreland hills, like the Bala limestone of North Wales, which it probably represents. This Coniston limestone has an overlying conformable group of argillaceous strata (Ashgill shales) containing *Trinucleus concentricus*, *Phacops apiculatus*, *P. mucronatus*, *Strophomena siluriana*, and other Lower Silurian fossils. Not far to the east, at the base of the great Pennine escarpment, contemporaneous volcanic rocks in the Coniston series are well developed.⁸⁰ But the enormous volcanic group of Westmoreland and Cumberland dies out rapidly in that direction, for in the Craven district it is represented by a series of sandstones, grits and slates (often green), probably 10,000 feet thick, which passes up conformably into the Coniston limestone series.⁸¹

The Southern Uplands of Scotland are formed almost wholly of Lower and Upper Silurian strata which have been thrown into innumerable plications, often overthrust and reversed. The working out of this complicated structure has been made possible chiefly by the evidence furnished by certain zones of graptolitic shales, as has been well worked out by Prof. Lapworth. The following table exhibits in descending order the subdivisions which have been established, with some of their characteristic fossils.⁸²

⁸⁰ Harkness, Q. J. Geol. Soc. xxi. 1865, p. 235. Nicholson, Geol. Mag. 1869, p. 213. This "Crossfell inlier" has been described by Messrs. Nicholson, Marr and Harker, Quart. Journ. Geol. Soc. xlvii. 1891, p. 500.

⁸¹ Hughes, Geol. Mag. iv. 1867, p. 346. This area had previously been described by Sedgwick, Trans. Geol. Soc. (2) iii. p. 1; and by Phillips, Q. J. Geol. Soc. viii. p. 35.

⁸² See Lapworth, Geol. Mag. 1889, pp. 20, 59. The prolongation of the remarkable volcanic zone over the greater part of the Southern Uplands has been detected by Mr. B. N. Peach in the course of the Geological Survey.