

numerous, like the *Belemnite fusiformis*, resemble spearheads, in being broadest near the middle, and in diminishing toward both ends. In subdividing these great families, various principles of classification have been adopted. There are grooves, single in some species, double, and even triple, in others; extending from the apex downwards in some, extending from the base upwards in others; and these have been regarded by Phillips,—the geologist who has most thoroughly studied the subject,—as constituting valuable characteristics not only of species, but of genera and formations. Miller took into account, as principles of classification, not only the general form, but even the comparative transparency or opacity, of the column,—marks selected in accordance with the belief that the column was originally the solid substance it is now. The order furnishes, doubtless, its various marks of specific arrangement. I have even found the hint borrowed from the architect, of taking the proportions of species by their diameters, not without its value. In measuring, for instance, four well-preserved specimens of the *Belemnite abbreviatus*, one of the bulkiest which occurs in our Scotch Lias, and whose average length is six inches, I found that two of the four contained  $5\frac{1}{2}$  diameters, one  $5\frac{1}{4}$  diameters, and one  $5\frac{3}{4}$  diameters; while another bulky Belemnite of the Scotch Oolite, not yet named apparently, whose average length is  $3\frac{1}{2}$  inches, contains only  $3\frac{1}{2}$  diameters, and strikes at once as specifically different from the others. Equally striking is the specific difference of the *Belemnite elongatus*, which contains from nine to ten diameters,—of another nameless species which contains from twelve to thirteen diameters,—of another which contains from fifteen to sixteen diameters,—of another, agreeing in its proportions with the *Belemnite longissimus* of Miller, which contains from eighteen to twenty diameters,—of another which contains from twenty-three to twenty-four diameters,—and of yet another, long