

The shell of the *Ammonites Heterophyllus* (Pl. 38, and Pl. 39,) affords beautiful exemplifications of the manner in which the mechanical strength of each transverse plate is so disposed, as to vary its support in proportion to the different degrees of necessity that exist for it in different parts of the same shell.\*

titions of an Ammonite. Pl. 35 represents the form of the external shell, wherein the body occupied the space extending from a. to c., and corresponding with the same letters in Pl. E. 36.

This species has a single series of strong ribs passing obliquely across the shell of the outer chamber, and also across the air-chambers. From c. to the inmost extremity of the shell, these ribs intersect, and rest on the sinuous edges of the transverse plates which form the air chambers. These edges are not seen where the outer shell is not removed. (Pl. 35, e.) A small portion of the shell is also preserved at Pl. 35, b.

From d. inwards, these sinuous lines mark the terminations of the transverse plates at their junction with the external shell; they are not coincident with the direction of the ribs, and therefore more effectually co-operate with them in adding strength to the shell, by affording it the support of a series of various props and buttresses, set nearly at right angles to its internal surface.

\* Thus on the back or keel, Pl. 39, from V. to B., where the shell is narrow, and the strength of its arch greatest, the intervals between the septa are also greatest, and their sinuosities comparatively distant; but as soon as the flattened sides of the same shell, Pl. 38, assume a form that offers less resistance to external pressure, the foliations at the edges of the transverse plates approximate more closely; as in the flatter forms of a Gothic roof, the ribs are more numerous, and the tracery more complex, than in the stronger and more simple forms of the pointed arch.

The same principle of multiplying and extending the ramifications of the edges of the transverse plates, is applied to other species of Ammonites, in which the sides are flat, and require a