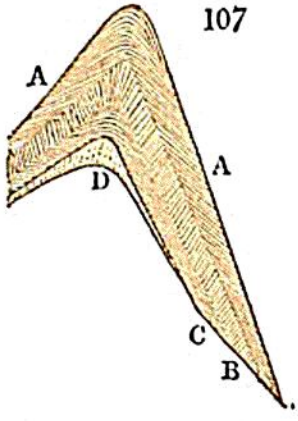
which unites the carbonate of lime is less in quantity and not so evidently disposed in layers; but it is more equally blended with the earthy particles, with respect to which it appears to perform the office of a cement, binding them strongly together, although it has of itself but little cohesive strength. The *Cypræa* and the *Volute* are examples of porcellaneous shells.

In shells of this kind the carbonate of lime assumes more or less of a crystalline arrangement; the minute crystals being sometimes in the form of rhombs, and sometimes in that of prisms. In the former case they are composed of three distinct layers, as may be seen by making sections of any of the spiral univalve shells, or simply by breaking them in various directions. Each layer is composed of very thin plates, marked by oblique lines, which show the direction of the crystalline fibres.* The direction of the layers and fibres is also rendered manifest by the planes of cleavage, when they are broken into fragments. The plates of the outer and inner layers are always directed from the apex of the cone to its base, so as to follow the direction of the spire: while, on the contrary, those of the intermediate plate form concentric rings round the cone parallel to its base. Thus the fibres of each layer are at right angles to those of the layer which is contiguous to it; an arrangement admirably calculated for giving strength to the shell, by opposing a considerable cohesive resistance to all forces tending to break it, in whatever direction they may be applied.* We here find that a principle, which has only



* These lines are shown in the diagram, Fig. 107, which represents a longitudinal section of a shell of this kind. A is the outer layer, of which the fibres pass obliquely downwards. B is the middle layer, having fibres placed at right angles with the former. C is the third, or inner layer, the fibres of which have a direction similar to the outer layer. Within this layer there is frequently found a deposite of a hard, transparent, and apparently homogeneous calcareous material, D. Of this latter substance I shall afterwards have occasion to speak.