The outer lattice-shell of the Phractopeltida, or their "cortical shell," is at least twice as broad, commonly about three times as broad, as the enclosed inner shell; it is much more varied in composition than the latter. Like the greater part of the Dorataspida we may distinguish here in the lattice-work two kinds of pores—parmal pores and sutural pores. The parmal pores are produced by the union of the meeting branches of the apophyses of each single spine, and are therefore visible on each isolated spine; whilst the sutural pores are formed by the meeting branches of the apophyses of neighbouring spines. The distinction of the parmal and the sutural pores, easy in most Dorataspida, is difficult in most Phractopeltida, because the sutures between the meeting branches are usually very early obliterated. However, *the place of the obliterated suture is often indicated by the thickened condyles* of the apophyses on both sides of the suture. Commonly also the form of the sutural pores is much more irregular than that of the parmal pores; the former are more or less constricted in the middle by the intumescence of the sutural condyles, whilst the latter are more roundish, elliptical, kidney-shaped, or square. The number of the pores in the outer shell in the typical normal form of Phractopeltida seems to be the same as in the most species of *Dorataspis*, *Diporaspis*, &c., between ninety and one hundred, viz., forty parmal pores and from fifty to sixty sutural pores. However, in many species this number is increased. Since in all Phractopeltida, each of the twenty plates is composed only of the meeting branches of two opposite apophyses, we find originally in each plate only two primary parmal pores or "aspinal pores." But in some species there occur four, six, or more pores in each plate; in this case two of them only are aspinal pores, all the others being "coronal pores." Moreover, in those species which exhibit on the base of each spine in the outer shell four crossed pores (Pl. **133**, fig. 2), these are not four equivalent aspinal pores (as in the Tessaraspida), but the two opposite are primary or aspinal pores and the other two (different from them in size and form) coronal pores. However, the number of coronal pores in the Phractopeltida is never so large as in many Dorataspida, and the same holds good also for the increasing number of the irregular sutural pores. In none of the species observed does the total number of the pores in the outer shell reach two hundred.

The original mode of development of the apophyses composing the outer shell seems to be imitated by the free apophyses of the third order, which are developed from the radial spines outside the outer shell in all Phractopeltida, with the single exception of the simple ancestral genus *Phractopelta*. These apophyses of the third rank are also originally constantly two, opposite to one another (after the type of *Lithophyllium*, *Dorataspis*, &c.). Commonly they do not remain simple, but become branched, and by communication of the neighbouring branches small lattice-plates arise. Originally each of these free lattice-plates has only two parmal pores, but the number of the parmal pores increases afterwards, so that we may distinguish two (primary)