

another specimen, cut longitudinally by the saw of the lapidary, yields a similar section, but greatly more compressed in the cavities ; on which, of course, as unsupported hollows, the compression to which the entire cranium had been exposed chiefly acted. When the top and bottom of a box are violently forced together, it is the empty space which the box encloses that is annihilated in consequence of the violence.

It is deserving of notice, that the analogies of the cranial cavities in this ancient Ganoid should point so directly on the cranial cavities of that special Ganoid of the present time which unites a true skull of cartilage to a dermal skull of osseous plates,—a circumstance strongly corroborative of the general evidence, negative and positive, on which I have concluded that the true skulls of the first Ganoids were also cartilaginous. It is further worthy of observation, that in all the sections of the cranium of *Dipterus* which I have yet examined, the internal line is continuous, as in the Placoids, from nape to snout, and that the true skull presents no trace of those cerebral vertebræ of which skulls are regarded by Oken and his disciples as developments. Historically at least, the progress of the ichthyic head seems to have been a progress from simple cartilaginous boxes to cartilaginous boxes covered with osseous plates, that performed the functions, whether active or passive, of internal bones ; and then from external plates to the interior bones which the plates had previously represented, and whose proper work they had done.

The principle which rendered it necessary that the divisions which exist in the dermal skulls of the first Ganoids should so closely correspond with the divisions which exist in the internal skulls of the osseous fishes of a greatly later period, does not seem to lie far from the surface. Of the