

observation and for general views, which had produced his *Metamorphosis of Plants*, he pursued his speculations on these subjects eagerly and successfully. And in 1795, he published a *Sketch of a Universal Introduction into Comparative Anatomy, beginning with Osteology*; in which he attempts to establish an "osteological type," to which skeletons of all animals may be referred. I do not pretend that Göthe's anatomical works have had any influence on the progress of the science comparable with that which has been exercised by the labors of professional anatomists; but the ingenuity and value of the views which they contained was acknowledged by the best authorities; and the clearer introduction and application of the principle of developed and metamorphosed symmetry may be dated from about this time. Göthe declares that, at an early period of these speculations, he was convinced^b that the bony head of beasts is to be derived from six vertebræ. In 1807, Oken published a "Program" *On the Signification of the Bones of the Skull*, in which he maintained that these bones are equivalent to four vertebræ; and Meckel, in his *Comparative Anatomy*, in 1811, also resolved the skull into vertebræ. But Spix, in his elaborate work *Cephalogenesis*, in 1815, reduced the vertebræ of the head to three. "Oken," he says,^c "published opinions merely theoretical, and consequently contrary to those maintained in this work, which are drawn from observation." This resolution of the head into vertebræ is assented to by many of the best physiologists, as explaining the distribution of the nerves, and other phenomena. Spix further extended the application of the vertebral theory to the heads of all classes of vertebrate animals; and Bojanus published a Memoir expressly on the vertebral structure of the skulls of fishes in Oken's *Isis* for 1818. Geoffroy Saint-Hilaire presented a lithographic plate to the French Academy in February 1824, entitled *Composition de la Tête osseuze chez l'Homme et les Animaux*, and developed his views of the vertebral composition of the skull in two Memoirs published in the *Annales des Sciences Naturelles* for 1824. We cannot fail to recognize here the attempt to apply to the skeleton of animals the principle which leads botanists to consider all the parts of a flower as transformations of the same organs. How far the application of the principle, as here proposed, is just, I must leave philosophical physiologists to decide.

By these and similar researches, it is held by the best physiologists

^b *Zur Morphologie*, 250.

^c Spix, *Cephalogenesis*.