

the representatives of different families resemble one another more in proportion as they are younger. But the peculiarities which distinguish them most prominently do not make their appearance at the same time. Features which belong to a later stage of growth in one family become distinct in other families at a much earlier period of life.<sup>1</sup> Some stop at one point, while others undergo further changes. Yet, the order in which these changes take place is so uniform, that it may furnish the means of determining the relative standing of these animals, as soon as it is admitted that the characters which distinguish the earliest stages of growth are inferior to those of the mature development.

The great size of the head and neck is a remarkable feature in all the young Testudinata, in no one of which are these parts retractile. The proportions are greatly changed afterwards, and the head and neck become retractile in the Amydæ. I take it, therefore, that large-headed Turtles, the head of which cannot

cessive appearance of the characters peculiar to groups of a different importance may be in different branches of the animal kingdom. In Insects, for instance, the class characters, — the tracheæ and articulated legs, — appear always before the ordinal characters, the wings; the family characters, — the form, — are also fully defined before the ordinal characters appear, etc. How different from what we have seen in the Testudinata!

<sup>1</sup> A glance at Pl. 1 to 6 will show to what extent the young representatives of some families differ in form from the adult, and how early others acquire their family characters. All the figures of these plates represent young Turtles in their natural size at the time of hatching, or as nearly at that time as I could obtain them. Yet neither the CHELONOIDÆ, (*Thalassochelys Caouana*, Pl. 6, fig. 13-16,) nor the TRIONYCHIDÆ, (*Aspidonectes spinifer*, Pl. 6, fig. 1 and 2; *Aspidonectes Emoryi*, Pl. 6, fig. 4 and 5; *Platypeltis ferox*, Pl. 6, fig. 3; *Amyda mutica*, Pl. 6, fig. 6 and 7,) nor the CHELYDROIDÆ, (*Chelydra serpentina*, Pl. 4, fig. 13-16, and Pl. 5, fig. 18 and 19; *Gypochelys Temminckii*, Pl. 5, fig. 23-27,) nor the CINOSTERNOIDÆ, (*Ozotheca odorata*, Pl. 4, fig. 1-6; *Ozotheca tristycha*, Pl. 5, fig. 20-22; *Cinosternum pennsylvanicum*, Pl. 4, fig. 7-12, and Pl. 5, fig. 16 and 17; *Cinosternum flavescens*, Pl. 5, fig. 12-15; *Cinosternum sonoriense*, Pl. 5, fig. 8-11,) exhibit marked differences in their form from the adults; or, what

amounts to the same, their family characters are fully developed, not only at the time of hatching, but even long before. The EMYDOIDÆ, on the contrary, — (such as *Ptychemys concinna*, Pl. 1, fig. 13, Pl. 2, fig. 4-6; *Ptychemys mobiliensis*, Pl. 3, fig. 14-16; *Ptychemys rugosa*, Pl. 26, fig. 1-3; *Trachemys elegans*, Pl. 3, fig. 9-11; *Trachemys scabra*, Pl. 2, fig. 13-15; *Graptemys geographica*, Pl. 2, fig. 7-9; *Graptemys LeSueurii*, Pl. 2, fig. 10-12, and Pl. 5, fig. 5-7; *Malacoclemmys palustris*, Pl. 1, fig. 10-12; *Chrysemys picta*, Pl. 1, fig. 1-5, and Pl. 3, fig. 4; *Chrysemys marginata*, Pl. 1, fig. 6, and Pl. 5, fig. 1-4; *Chrysemys oregonensis*, Pl. 3, fig. 1-3; and *Chrysemys Bellii*, Pl. 6, fig. 8 and 9; *Deirochelys reticulata*, Pl. 1, fig. 14-16, and Pl. 2, fig. 1-3; *Emys Meleagris*, Pl. 4, fig. 20-22; *Nanemys guttata*, Pl. 1, fig. 7-9; *Actinemys marmorata*, Pl. 3, fig. 5-8; *Cistudo virginica*, Pl. 4, fig. 17-19; and *Cistudo ornata*, Pl. 3, fig. 12 and 13,) — have almost perfectly circular outlines, and exhibit in no way the slightest tendency to the more or less elongated form of the adult, with the exception perhaps of *Malacoclemmys palustris*, and *Deirochelys reticulata*, which are slightly oval; so that, at the time of hatching, no Emydoid has assumed the form characteristic of that family. *Xerobates Berlandieri*, Pl. 5, fig. 17-19, the only young representative of the family of Testudinina which I had an opportunity of examining, shows that these Turtles also are obicular before they assume their final, characteristic form.