

sive series as they are characterized by the degrees of complication of their structure, other kinds of groups may stand higher or lower, when compared with one another.¹ This is strikingly the case with the families of Testudinata, between which there is a marked gradation. Their respective standing is even so easily ascertained, that, ever since these animals have been divided into families, all herpetologists have arranged them in the same progressive series, beginning with the marine Turtles as the lowest, and ending with the land Turtles as the highest, while they all assign to the fresh-water Turtles an intermediate position between the two other groups. It is true, as far as the marine Turtles, on one hand, and the land and fresh-water families, on the other hand, are concerned, the relative position of these two groups is determined by structural features, which constitute sub-orders; but the gradation of the families is not limited to the relative standing thus assigned to them, for even the families of the Chelonii, and those of the Amydæ, stand higher or lower among themselves; and within these narrower limits the gradation is no longer determined by the complication of their structure, but chiefly by peculiarities in those features which essentially characterize the families, namely, the forms. Chelonii, compared with Amydæ, have lower forms; the form of the Sphargididæ is made up of elements of an inferior order to that of the Chelonioidæ; the form of the Trionychidæ is simpler in its essential elements than that of the Chelyoidæ, or that of the Chelydroidæ and of the Cinosternoidæ, in which last three families are preserved through life, elements of form which recall the characteristic features of the Chelonii, but which mostly disappear in the first years of life in the Emydoidæ. In many respects the form of the Emydoidæ approximates already that of the Testudinina, to which the highest rank undoubtedly belongs, on account of the higher symmetry of the body.

This progressive series of the families of Testudinata, as far as it is based upon their form, is not inferred simply from a vague estimate of the gradation of these forms, as they appear in the adult, but rests upon a direct comparison of the metamorphoses of the young, all of which undergo most remarkable changes in their form. These changes are the more instructive, as they constitute a connected series, when they are compared at certain stages of the growth in different families, and yet they lead, in the end, in each family, to the development of a typical pattern characteristic of the family. Starting from a common type at an early embryonic period, the form is gradually modified to a certain degree, in one family, before it assumes its typical characters; in another family the same primitive type diverges in another direction, and then assumes

¹ See Part I., Chap. 2, Sect. 3, p. 152-154.