

head back of the eyes, and projecting somewhat over the neck, entirely covering the temporal muscles above. Thus neither head nor limbs can be withdrawn into the shield, and the front limbs cannot even be brought round before the body, but they can all be drawn back somewhat. So the method of protecting the extremities and the head, which is so fully developed in the other sub-order, and is so characteristic of the order, is here but just begun. The shield itself is here much less developed than in the other sub-order. In one family, the Sphargididæ, it is little more than a broad girdle, encircling the thorax and abdomen; its bony part does not rest upon the ribs, and has no marginal rim. In the other family, the Chelonoidæ, the shield is somewhat larger, covering the pelvic region above; but still the front limbs, including the shoulders, are free and exposed, and so also are the hind limbs below, including the hips. Although the bony derm rests upon the ribs, their union never becomes so intimate as in the other sub-order, and the plastron is but imperfectly ossified and rather loosely connected with the carapace. Thus we find the most prominent characteristic features of the order least developed in this sub-order; and if we add to this the habitat, the mode of locomotion, the paddle-like structure of the limbs, the reduced state of the hind pair, the want of specialization in the neck vertebræ, and the unsymmetrical relations of the two ends of the body, we cannot hesitate to consider this group as the lowest of the Turtles, and to recognize a kind of gradation in rank between them and the Amydæ. But here, in this lowest group, where the characters of the order are least prominent, we find features of form and structure which remind us of animals higher in the series, and belonging to another class. The mode of locomotion, the form and structure of the locomotive apparatus, the great preponderance of the fore part of the body, the bill-like jaws, the overlapping of the scales in some, as in Penguins, are all characters which belong to the class of Birds, and are there only carried out to their fullest development.

*The Sub-Order of Fresh-water and Land Turtles*—AMYDÆ, Opp.<sup>1</sup> The habitat is various. Some species spend nearly all their life in the water, some live partly under water and partly on dry land, and some entirely on dry land; yet none are entirely aquatic, none remain for any great length of time in the water without seeking the bottom, nor can they swim unsupported for a long distance. When in the water, they remain usually at the bottom, either at rest or moving along over it. They seldom swim freely, except when they rise to the surface or descend to the bottom. So, in fact, they dwell principally upon land, sometimes under the

<sup>1</sup> Like the sub-order of Chelonii, that of Amydæ also was first recognized and characterized by Op-

pel, in his classical paper, *Die Ordnungen, Familien, u. Gattungen der Reptilien*, München, 1811, 1 vol. 4to.