

SECTION X.

EATING, DRINKING, AND DIGESTIVE APPARATUS.

In describing the skin, we have already mentioned the characteristic horny sheath of the jaws, which forms a bill such as we find only in Birds besides. The upper jaw always includes the lower, as it reaches beyond this. Generally, the horny sheath which covers the jaws runs more or less inwards into the mouth; in the *Chelonioidea*, it forms even several ridges parallel to the margin of the jaw, evidently for crushing and breaking the thick sea-weeds, upon which they feed. As all other Reptiles have true teeth and no horny cover whatsoever on the maxillar bones, this sheath is peculiar to the order of *Testudinata*;¹ and while all other Reptiles use their jaws merely for seizing their food, Turtles, on the contrary, chew it. This is particularly the case with the herbivorous families, *Chelonia* and *Testudo*. A much more extensive use of the tongue is connected with the act of chewing, as long as the food is in the mouth, than we observe in other Reptiles. Thus the fleshy tongue of the Turtles serves three different purposes: first, in tasting, (see p. 277,) then in the act of respiration, (see p. 281,) and thirdly, in managing the food as long as it is in the mouth; that is, for bringing it into the right position between the sharp scissors formed by the bill, and for moving it into the pharynx and oesophagus when it is sufficiently divided. The last two uses of the tongue are the more interesting, as we do not meet them again, to this extent, except in *Mammalia*. The tractus intestinalis has generally thick walls. The oesophagus of the family of *Chelonioidea* is provided with long, hard papillæ. The stomach lies always transversely, crossing the body from the left to the right. The length of the whole intestine, in comparison with the length of the trunk of the animal, varies very much in different families, being longer in the herbivorous, and shorter in the carnivorous Turtles, just as among *Mammalia* and *Birds*. The relative length of the different parts of the intestine, compared with each other, varies still more; the rectum being very short in *Emydoidæ*, *Cinoster-*

¹ Yet the order of Turtles is not the first among Vertebrates, in which we find the jaws transformed into a bill. We find already something similar among the Fishes, in the so-called Parrot Fishes, (*Scarus*), and again among Amphibia, in the larvae of the *Batrachia anura*. I may add, however, that

after removing the horny sheath, we find, along the dental ridges of the jaws, in the young *Trionyx* and *Chelydra*, a regular series of holes for nerves, which are evidently homologous to the alveolæ of the teeth in other Reptiles. These holes contain, however, no rudimentary teeth, as are found in the jaws of Whales.