traces of teeth, but their jaws arc provided with horny sheaths, with hard and sharp edges, forming a beak.

The number of Chelonians known at present may be estimated at about 200, the fresh-water species being far the most numerous, and are abundant in well-watered districts of the tropical and sub-tropical zones. Their number and variety decrease beyond the tropics, and in the north they disappear entirely about the 50th parallel in the western and about the 56th in the eastern hemisphere, whilst in the southern hemisphere the terrestrial forms seem to advance to 36°S. only. The marine turtles, which are spread over the whole of the equatorial and sub-tropical seas, sometimes stray beyond those limits. As in other orders

of reptiles, the most specialized and the largest forms are restricted to the tropics (with the exception of *Macroclemmys),* but, unlike lizards or snakes, Chelonians are unable to exist in sterile districts or at great altitudes.

They show a great divergence in their mode of life—some living constantly on land, others having partly terrestrial partly aquatic habits, others again rarely leaving the water or the sea. The first-mentioned, the land tortoises proper, have short club-shaped feet with blunt claws, and a very convex, heavy, completely ossified shell. In the fresh-water forms the joints of the limb bones are much more mobile, the digits distinct, armed with sharp claws, and united by a membrane

or web; their shell is less convex, and is flattened, and more or less extensive areas may remain unossified, or transparent windows are formed with age, for instance in *Batagur.* As a rule, the degree of development of the interdigital web and of convexity of the shell indicates the prevalence of aquatic or terrestrial habits of a species of terrapin. Finally, the marine turtles have paddle-shaped limbs resembling those of Cetaceans.

Land tortoises are sufficiently protected by their carapace, and therefore have no need of any special modification of structure by means of which their appearance would be assimilated to the surroundings and thus give them additional security from their enemies. These, however, are few in number. On the other hand, among the carnivorous terrapins and fresh- water turtles instances of protective resemblance are not scarce, and may even attain to a high degree of specialization, as in *Chelys,* the matamata. The colours of land tortoises are generally plain, or in yellow and brown patterns, whilst those of many terrapins are singularly varied, bright and beautiful, especially in the very young, but all this beauty is lost in the adult of many species.

Chelonians are diurnal animals; only a few are active during the night, habitually or on special occasions, as, for instance, during ovipositîon. Land tortoises are slow in all their move- ments, but all kinds living in water can execute rapid motions, either to seize their prey or to escape from danger. All Chelonians are stationary, residing throughout the year in the same locality, with the exception of the marine turtles, which periodically migrate to their breeding-stations. Species inhabiting temperate regions hibernate.

Land tortoises, a few terrapins, and some of the marine turtles are herbivorous, the others carnivorous, their prey con- sisting chiefly of fish, frogs, molluscs, and other small aquatic animals; some, *e.g. Clemmys insculpta* and *Cisludo Carolina,* have a mixed vegetable and animal diet.

All Chelonians are oviparous, and the eggs are generally covered with a hard shell, mostly elliptical, rarely quite round, as in the case of the marine turtles. The various modifications, and also the not uncommon individual variations, in the composition of the carapace plates and the number and disposition of the shields, are very significant. They show an unmistakable tendency towards reduction in numbers, a concentration and simplification of the shell and its covering shields. We can to a certain extent reconstruct a generalized ancestral tortoise and thereby narrow the wide gap which separates the Chelonia from every other reptilian order. The early Chelonians possessed most likely more than five longitudinal dorsal rows of plates. The presence of several small supramarginal shields in *Macroclemmys* may be an indication that the total number of longitudinal rows was originally at least seven. The number of transverse rows, both of plates and shields, was also greater. We can account for at least twelve median plates and as many pairs of marginals, but for only eight median and eight pairs of costal shields (individual variations observed in *Thalassochelys).* It stands to reason that originally each trunk metamere had its full complement of plates and shields ; consequently that about twelve trunk metameres partook in the formation of the shell, which, with subsequent shortening and broadening of the trunk, has under- gone considerable concentration and reduction, a process which has reduced the costal plates to seven pairs in the American species of *Trionyx,* has completely abolished the neural plates of some Chelydidae, and has brought down the costal shields to four pairs in the majority of recent Chelonians. In several species of *Testudo* the little nuchal shield is suppressed, thereby reducing the unpaired median shields to five. The complete absence of shields in the *Trionychidae* and in *Carettochelys* is also due to a secondary process, which, however, has proceeded in a different way.

*Classification of Chelonia,*

H. Stannius in 1854 clearly separated the Trionychoidea from the rest. E. D. Cope, in 1870, distinguished between Pleurodira and Cryptodira according to whether the neck, *δέρη* or *δeιρη,* is bent sidewards, or hidden by being withdrawn in an S-shaped curve in a vertical plane; he also separated *Sphargis* as Athecae from all the other Chelonians, for which L. Dollo, in 1886, proposed the term Thecophora. These terms are most unfortunate, misleading. Athecae (from *θήκη,* shell) has reference to the absence of a horny shell-covering in the leathery turtle; but since the same character applies to Trionychoidea and to *Carettochelys,* nobody can guess that