the thin, elastic epidermis. As in all Vertebrata, so also is the epidermis in Turtles, composed of characteristic cells, of an hexagonal or irregular form, which are dry and flat near the surface, and more or less imbricated, while their contours are better defined the deeper we penetrate and the more we approach their matrix. But in relation to the mode of growth and the duration of these cells, upon a larger scale, up to the time when they are cast in moulting, we find the greatest variety among Turtles, as we find, indeed, among all the different types of Vertebrata. The differences in the epidermal formations, observed in Turtles, naturally lead us to expect such a diversity among them in particular. In the Sphargididæ and the Trionychidæ, I have had no opportunity of seeing a regular casting off of the epidermis, though there can be hardly any doubt that a change of the epidermis takes place here, and that it is effected by the dropping of single cells or of thin layers, for I have noticed it in Trionyx, as we find it in the epidermis of Frogs and of Man himself, in whom it is quite similar. But in all other Turtles, the nature of the epidermis, and therefore its moulting also, are entirely different. In Eretmochelys imbricata, the plates of the shield (the tortoise-shell of commerce) are very large, and imbricated one above the other. These plates increase only in front, where they are imbedded in a thick matrix, in the Malpighian layer, as in a case. As the plates enlarge in front, the older parts must move backwards, where they are worn off by external mechanical agencies. This process goes on so rapidly in these Turtles, that in a specimen of two feet in length, no trace of those primary scales, which covered the whole shield during the first year, could be found. This mode of growing and moulting, if we may call it so, is very similar to that in the human nail. But we find a very different process in land Turtles, and to some degree also in Cistudo, in which the plates rest entirely, in front and on the sides and behind, upon their matrix, in the Malpighian layer. They are not at all free and raised behind, as is the case in Eretmochelys, and thus they grow not only in front, but with their whole under surface and on all sides; hence it follows that we find upon the surface of each scale, around a small angular central plate, (the scale of the first year's growth,) a smaller or greater number of concentric stripes or regular annual rings, as they are exhibited on a transverse section of an old tree.[1]

[1] This is remarkably obvious in some specimens of the Xerobates carolinus (Testudo polyphemus) of our Southern and South-western States, and always in Testudo radiata of Madagascar, and in Testudo geometrica of the Cape of Good Hope. In relation to the Gopher, (Test. polyphemus,) I have to remark that the plates of most adult specimens are perfectly smooth, so that their successive growth and their age can no longer be read upon the plates, as it is easy to do in many other species of that family. The Gopher, and perhaps also the Galapagos Turtle (T. indica) burrow into the ground and live in earth holes, and this accounts, perhaps, for their worn and polished plates. But why should