

Thus we have two different modes of growth in the dermal plates of Testudinata: that of Eretmochelys on one hand, and that of Testudo on the other. Between these extremes, we have every possible intermediate feature. Thus, we find that in the Chelonioidæ and Emydoidæ, though the plates are not free behind as in Eretmochelys, but on the contrary lie with their whole under surface upon the stratum Malpighii, as in Testudo, they still grow almost exclusively in front and on the sides, showing only small additional stripes behind, or none at all. This is still more strikingly exhibited in the Cinosternoidæ, and here it is in the direction of the Eretmochelys, as they show an evident inclination to an imbricated position of their plates. It is already visible in Cinosternon, especially in Cinosternon flavescens, but still more in the Ozotheca triquetra of our Southern States, and also in our Northern Ozotheca odorata, when young. I have already had occasion to allude above to the moulting of the epidermis when speaking of Sphargis, Trionyx, and Eretmochelys; but I am persuaded that such a change in fact takes place in all Turtles. In Chrysemys picta, and in several other fresh-water Turtles, such as Trachemys elegans and scabra, Ptychemys concinna, Graptemys Lessueurii, etc., I saw in the spring the uppermost layer of the dermal plates cast off at once as one continuous, thin, mica-like scale all over the plate, and under it the fresh epidermis, showing beautifully by its transparency the colors of the Malpighian layer. This reminded me very much of the moulting of Snakes; but the difference consists in this, that in Snakes the epidermis is cast off as one continuous skin from the snout to the end of the tail, while in Turtles each scale casts its epidermis for itself. In Testudo, the casting off of the old epidermis is very different in different species, and even in different specimens of the same species.¹ I have seen in many adult specimens of Xerobates carolinus, and still more distinctly in some old specimens of Testudo radiata, the central plate of the scales, that is the plate of the first year, perfectly preserved with all its fine granules, so sharp indeed that it seemed as if nothing had been cast from their surface, while others were entirely worn out. These facts show that further observations are very much needed respecting the moulting of the Reptiles. Indeed, this subject requires to be studied anew in all Vertebrata.²

other specimens of Gopher, which have the same mode of life, exhibit all the sculptures of their plates? We find the same difference between the specimens of Cistudo virginea, and still more between those of Glyptemys insculpta, the smooth variety of which has been described as a distinct species under the name of E. speciosa.

¹ See, above, p. 259, note on Gopher and Cistudo.

² I mean here particularly also the moulting of Mammalia and Birds, which is by no means so fully understood as it would appear from our handbooks. D. Weinland has presented interesting remarks upon this subject in a paper read before the Boston Society of Natural History in the beginning of this year. See the Proceedings of the Boston Society of Nat. Hist. for 1856.