

REMARKS ON THE CHAMELEON.

By J. T. Towson, F.R.G.S.

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THE chameleon is a reptile that has attracted more general attention than any other saurian, principally from its possessing the power of changing its colour. For two thousand two hundred and fifty years Natural Historians, from Aristotle to the present time, have given minute descriptions of its organization and its habits; but it appears that most of these accounts have been compiled from the observations of Aristotle. No doubt exists that Pliny derives his information exclusively from this source.

In 1859, I read a paper on the chameleon before this Society, and in 1860 a second paper. The object of these was to show that some statements, which I regarded as inaccuracies, had remained uncontradicted during a very long period of time; and as these papers were illustrated by several living specimens, as well as by skeletons and dissected parts, I was confident in the accuracy of my remarks. The first statement to which I objected was "the absence of a sternum." In the very numerous cases I have dissected I have found a bone that has performed the duties of a sternum, as far as the anterior five pair of ribs are concerned. But the false ribs are entirely unsupported by this bone, and the eight posterior ribs are united by their cartilaginous prolongations towards the mesial line of the belly. In young specimens, in common with other parts of the skeleton, this bone had a cartilaginous appearance, but in the older animals it had become completely ossified.

It had also been stated that the "clavicle was entirely absent." It is true that the bone of the chameleon that performs the office of a clavicle, is very different in form to that

in the human skeleton, or to the furcula of birds, being a very compact bone of a rhomboidal form.

The curious mechanism by which the chameleon is enabled to strike its prey has not been fully described. When the tongue is not projected, the tubular part, about four inches and three-quarters long, is folded back on the lingual bone, which is about one inch and a quarter in length, and one sixteenth of an inch in diameter, and is so articulated to the base of the horns that the posterior part of the tongue is drawn back in the mouth, the whole of the tongue being then contained within the mouth.

The preparation for striking its prey is to bring the base of the horns forward in the mouth, when the tip of the tongue protrudes about a half an inch. It then watches its prey, at which it strikes with such rapidity and certainty, that in most cases I have witnessed, it has succeeded in capturing a fly on the wing.

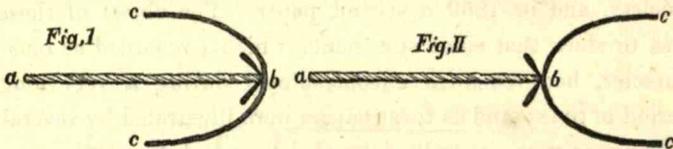


Fig. I represents the os-hyoides when the tongue is not projected. Fig. II the os-hyoides when the chameleon is preparing to strike its prey. *a b* is the lingual bone, round which the tubular part of the tongue is gathered when not projected. *c b* and *c b* the horns. *b* the base of the horns.

The principal object, however, I had in view, in preparing this third paper, was to bring to notice a fact regarding the chameleon which has never before been recorded, and so far departing from all former statements, that, if it were not established by undoubtable observations, could scarcely gain credence.

The fact had never before been doubted that the chameleon reproduced by means of eggs laid in the sand, and hatched by the warmth of the sun. In confirmation of this belief, I had

a chameleon which died immediately after laying thirty-two eggs; and many similar cases have come to my knowledge.

About five years since the Honourable Lady Cust procured from the Cape of Good Hope a pair of chameleons which, to all appearance, were a very much smaller variety of the *Chamæleo vulgaris* of Egypt. In size, it is not more than one half of that brought from the banks of the Nile. But size does not determine species, even amongst higher classes of animals. The female, to the surprise of everyone, brought forth nine living young. Her ladyship invited Mr. Moore, Mr. Turner, and myself to investigate the matter, which was established beyond a doubt. In a few weeks a second brood was brought forth, and since that period her ladyship has had others bringing forth living young. The number of the young vary from nine downwards. In the present year there is a chameleon at Leasowe Castle that brought forth, in Madeira, nine young ones at a birth; the cold summer in this country killed all but two, which are still alive (9th October, 1872.)

No doubt these chameleons are ovo-viviparous. But the difference between oviparous and ovo-viviparous reptiles is not, physiologically, so great as would at first appear. Both reproduce from eggs; but the former deposit their eggs before the embryo is formed, while the latter retain the eggs within the oviduct until the young are ready to leave them, and the covering is then lacerated in the act of parturition, and the emancipation of the young takes place.

There are two English lizards,—the *lacerta agilis* and the *zootoco vivipara*; the former is undoubtedly oviparous, the latter ovo-viviparous. The *zootoco vivipara* may be found in abundance during the summer months on the sand banks of Hoylake. Although these are regarded as two species, it is not on account of the difference in their mode of reproduction, but from their dental arrangements. Neither is size regarded as a specific distinction, since the varieties of the *lacerta agilis* differ in this respect widely from each other; and from the

remark of Mr. Bell, that *he does not think the lacerta agilis* ever brings forth its young alive, we should imagine that he does not consider, that being oviparous or ovo-viviparous is a sufficient distinction to determine one being of a different species to another.

Having, in the above paper, referred to the Honourable Lady Cust as an authority, I deemed it my duty to submit the revise to her ladyship previously to publication. In reply, I received the following information, which is, beyond doubt, very valuable, being the result of the most accurate observations which, perhaps, have ever been made concerning the habits of that extraordinary animal, the chameleon. I have permission to insert it as an addendum to the above.

“ Sir,—It is with much pleasure I contribute a page to your valuable little work on the chameleon. Your examination of this reptile, and your scientific knowledge, have brought to light much hitherto unknown by the earliest naturalists; but there is one remark, I think, still wanting. I believe that the extraordinary power of *sight* to be the recompense for the want of the organs of hearing. Though really fond of anatomy,—which the more it is studied, the more fully it proves how ‘fearfully and wonderfully made’ is every creature, and how beautifully adapted, by its Divine Creator, to different climates and modes of life,—my line is that of ‘practical or observant natural history,’ the result of which I now transmit.

“ The chameleons I have kept and studied for so many years are of the small variety, from the Cape of Good Hope; beautiful little creatures, apparently born for sunshine, when their colours are most brilliant, but fading at night.

“ I have successfully kept them on a tall shrub, inside the house in winter, outside in summer, watering the leaves with chilled water, morning and evening, as a substitute for dew. This is licked off by the flattened tongue and brushed off also by the beard,* communicating with the inside of the mouth. At times they will absorb much water dropped gently on them; at other times none. In their own rainy season they subsist entirely on water. They acquire full growth in about two years, and change their skins every few months. They are produced according to the heat of the weather, sometimes sooner than at other times. They are not always brought forth at one time, for I have found in my cage some larger than others. I have no reason to believe that they are very affectionate to their young, but they show an attachment to me and like to sit upon my finger, and if lost in the garden, would, after some days, when I have been sitting out, return to me evidently pleased and be most unwilling to quit my hand.

“ Should you require any further remarks, I should be happy to forward your wishes.

“ MARY ANNE CUST.”

* The dentilation of the dewlap or fanon.