

flattened horizontally and supported by the anterior process of the *os hyoides*, which forms a ridge along the middle of its inferior surface. At about four inches from the extremity of the horny *lamina* the margins become obliquely notched, and these notches, becoming deeper and closer together towards the extremity, occasion the bristled appearance on each side of the tongue. These bristles, Mr. Vigors observes, were generally applied to the morsels of food whilst held between the mandibles previously to being swallowed.

The *cornua* of the *os hyoides* are $1\frac{1}{2}$ inch in length. The *trachea* is narrow, and simple in its structure, the rings somewhat flattened and decreasing in diameter towards the inferior extremity, from which a single pair of muscles pass off to the *sternum*. The length of the lower fourth of the tube, and the state of tension in the *bronchia*, are regulated by a pair of small muscles, which, arising from the sides of the tracheal cartilages, are inserted into the bone of divarication at the extremity of the *trachea*: and that this part of the tube is subjected to variations in length is indicated by the tortuous character of the recurrent nerves attached to the sides of the *trachea* at this part. The lungs are small in proportion to the size of the bird, but of the usual form and structure. The abdominal air-cells are of small size. The heart is of a more oblong form than in general; its *apex*, as it were, truncate; its length 1 inch.

The pectoral muscles, as in the *Psittacidae*, are but feebly developed, and the keel of the *sternum* is of moderate size, not projecting more than half an inch from the plane of the bone. The *sternum* has four notches at its posterior margin. The clavicles, or lateral halves of the *furcula*, are here, as in the *Psittacidae* and *Struthionidae*, separate; they are 1 inch in length, slender, pointed at their lower ends, and joined to each other and to the *sternum* by ligament only.

The peculiar motions of the tail called for a particular examination of that part. It is difficult to state the precise number of the caudal *vertebræ* in consequence of the terminal ones being ankylosed, requiring for this purpose the examination of a young specimen at a period before the *ankylosis* takes place. In the skeleton of a Black-billed Toucan which I have examined, it would appear that three *vertebræ* are thus ankylosed, making the entire number of coccygeal *vertebræ* nine. The Woodpecker has also nine caudal *vertebræ*, and this seems to be the greatest number found in birds. The first six of these *vertebræ* in the Toucan are articulated by ball-and-socket joints, the ball and the socket being most distinct in the last two joints. That between the sixth and the ankylosed *vertebræ* is provided with a capsule and synovial fluid; the others have a yielding ligamentous mode of connexion. The spinous processes of these *vertebræ*, both superior and inferior, are of moderate size, but smallest in the sixth, where the greatest degree of motion takes place. The transverse processes, on the contrary, are large and broad, so as almost wholly to prevent lateral motion. The first of the ankylosed *vertebræ* is broad and flat and of a rounded form, supporting the two coccygeal glands: the last of these processes is compressed laterally, and of the ordinary ploughshare form. The caudal *vertebræ* can be inflected dorsad till their superior spines are brought into contact with the *sacrum*; in the opposite direction they can scarcely be bent beyond a straight line: and it is to this structure of the bones and joints that is to be attributed the capability in the Toucan of turning its tail upon its back (as represented in the Zoological Journal, vol. ii. pl. xv.), the muscles presenting comparatively few peculiarities, since the motion alluded to is remarkable rather for its extent than the vigour with which it is performed.

The principal *elevators* of the tail are the *sacro-coccygei superiores* (*sacro-sus-caudiens* of Vicq d'Azyr). They arise from two longitudinal ridges on the inferior and convex part of the *sacrum*, and are inserted into the superior spines of the first six *vertebræ* by detached tendons, terminating broadly in the ankylosed *vertebræ*. The principal antagonists of these muscles, *sacro-coccygei inferiores* (*sacro-sous-caudiens* of Vicq d'Azyr), pass over the first five *vertebræ* and terminate in the sixth and ankylosed *vertebræ*: their origins are wider apart than in the preceding pair of muscles, coming off from the margins of the sacro-sciatic notches. In the interval are situated small muscles passing from the transverse processes to the inferior spines of the first six *vertebræ*.

From the limited nature of the lateral motions of the tail the muscles appropriate to these movements are feeble, especially in comparison with those which are observed in the birds that spread their tail-feathers

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