

directed outwards. The second is nearly vertically placed, with its convexity directed backwards: it terminates in a narrow point below. The third or superior spongy bone makes a small projection towards the mesial plane, about the size of a pea. These spongy bones are formed by inward projections of the inner and posterior osseous parietes of the nasal passage; they are cellular, and air is continued into them from the cranial diploë; but the parietes of the nasal passage are entire and smooth, and lined by a delicate pituitary membrane. The inner table of the skull is continuous with the parietes of the nasal cavity, by means of the bony canal which accompanies and protects the olfactory nerves, and which represents, as it were, a single foramen of the cribriform plate of the mammalia. The communication of the cavity of the cranium with that of the nose is thus similarly formed, and is only obstructed in the recent state by the pituitary membrane, on the posterior *cul de sac* of which the olfactory nerve distributes its branches in a radiated manner. These branches were confined, as Scarpa has observed in other birds, to the pituitary membrane covering the septum narium and the superior spongy bone.

The external orifice of the meatus auditorius is situated about half an inch behind the lower boundary of the orbit. The membrana tympani closes it so obliquely that its plane is directed almost backwards; its anterior edge is consequently about three lines from the external orifice, while its posterior margin is at least six lines from the same point. It is convex outwardly as in birds generally. The apparatus of the internal ear is easily exposed, the semicircular canals being lodged in a delicate reticulation of the diploë of the cranium. These parts, with the ossiculum of communication and the cochlea, do not present any deviations from the ordinary structure worthy of notice.—R. O.

DESCRIPTION OF THE PLATE.

Fig. 1. Section of the cranium and upper mandible of the
Rhamphastos Toco.

- a. The cancellated structure of the beak.
 - b. The cavity at the base.
 - c. Branches of the fifth pair of nerves.
 - d d. The external orifices of the nostrils.
 - e. The osseous parietes of the nasal passages.
 - f. The osseous tubes protecting the olfactory nerves.
 - g. The pituitary membrane exposed, and branches of the olfactory nerve radiating upon it.
 - h. The superior semicircular canals of the internal ear.
 - i i. Hemispheres of the cerebrum.
 - k. Cerebellum.
- Fig. 2. The upper surface of the tongue.
- l. The fringed or feathered portion of the tongue.
 - m. The orifice of the larynx.
 - n. The orifice of the pharynx.

- o o. Cornua of the os hyoides (*cerato-hyal* bones of Geoffroy).

- p. The trachea, or windpipe.
- q. The gullet.

Fig. 3. Vertical longitudinal section of the head.

The same letters indicate the same parts as in the previous figures.

- d. Shows the internal aperture of the nostrils.
- r. The beginning of the spinal chord.
- s. The articulating surface of the occipital bone.
- t. The nasal septum or partition.
- u. The air-cell anterior to the orbit from which the air passes into the mandible.
- v. The cancellated structure of the lower jaw.

Fig. 4. Side view of the foot of *Ramphastos Toco*.

Fig. 5. Under surface of the same.