

obliquely forwards and upwards, and comes into close relation with the cervical air sac. It passes into the foramen of the transverse process of the first dorsal vertebra,¹ and thereafter extends forwards, lying in the bony canal formed by the transverse processes of the cervical vertebræ as far as the cephalic extremity of the neck. Its exact mode of termination I could not make out in any species, with the single exception of *Spheniscus mendiculus*, because of the impossibility of completely injecting it. In the species named, however, I found that the vertebral artery after escaping from the bony canal between the second and third cervical vertebræ, terminated by inosculating with the occipital artery. In all probability, therefore, in the Penguins as in the majority of birds, according to Barkow,² this is the normal mode of termination of the vertebral artery.

*The Subcutaneous Cervical Artery*³ comes off from the common carotid close to the vertebral artery. It passes obliquely forwards and outwards, and crossing the jugular vein reaches the deeper surface of the panniculus carnosus muscle. Here it applies itself to the vagus nerve, and accompanies it together with the jugular vein as far forward as the posterior extremity of the mandible. Having reached this point, the artery passes inwards, resting upon the lower surface of the rectus capitis anticus muscle, and terminates by inosculating with a branch of the external carotid.

(A) *The External Carotid Artery*

Is very short. In the King Penguin it does not exceed $\frac{1}{4}$ th of an inch in length. From its origin it passes obliquely outwards to gain the inner surface of the posterior extremity of the mandible, where it divides into three terminal branches. These branches are the lingual, the palatine, and the anastomotic. Of these the two former pass forwards while the latter passes backwards.

(a) *The Lingual Artery* at its origin is superficially placed. It extends from the external carotid almost horizontally forwards, lying along the inner side of the corresponding half of the lower jaw bone. At first it lies under cover of (above) the cornu of the hyoid bone, but farther forward it lies in the interval between the ramus of the lower jaw bone on the outer, and the hyoid cornu on the inner side. Towards its termination it rests upon the surface of the mylo-hyoid muscle, and having reached the symphysis of the lower jaw bone, inosculates with its fellow of the opposite side. The lingual artery, close to its origin, gives off a branch of some size which passes to supply the walls of the

¹ I consider the vertebra referred to to be the first dorsal, because the anterior bar of its transverse process is moveably articulated, both with the body of the vertebra and with the extremity of the posterior bar of its transverse process. The anterior bar of this transverse process thus forms a rudimental rib. By some authors this vertebra is considered to be the last member of the cervical series.

² Meckel's Archiv für Anatomie und Physiologie, 1829, p. 305.

³ The arrangement of this artery in the Hornbill is carefully described by Ottley in the Proc. Zool. Soc., 1879. In that bird the subcutaneous cervical artery inosculates with the vertebral artery, whereas in the Penguin it anastomoses with the external carotid. Ottley terms this artery the "arteria comes nervi vagi."