

bony spines which afford attachment to the tendons of the longi colli muscles in connection with the eleventh, twelfth, and thirteenth vertebræ are developed to a greater extent than in any other species. In *Pygosceles* and *Spheniscus minor*, on the other hand, these spines are entirely wanting in the twelfth and thirteenth cervical vertebræ. In *Pygosceles* I found the foramen in the transverse process of the thirteenth cervical vertebra incomplete on both sides, in consequence of the want of development of the anterior bars of its transverse processes. It is possible, however, that this may have been an individual peculiarity.

The *articular processes* present the usual arrangement. The posterior articular processes of the cervical vertebræ are provided with small bony tubercles which afford attachment to certain of the cervical muscles. These tubercles, in the case of the second, third, fourth, and fifth cervical vertebræ are largely developed, and form well-marked bony spines which diminish in size from before backwards. In the vertebræ behind the fifth they are scarcely recognisable until the tenth is reached, in which, as well as in the eleventh they form mere nodules. The twelfth and thirteenth cervical vertebræ are destitute of any trace of these nodules.

*Spinous processes* are absent in the case of all the cervical vertebræ, with the exceptions of the second, third, fourth, fifth, twelfth, and thirteenth. The spines of the second, third, and fourth vertebræ are well-marked, pointed processes which diminish in size from the second to the fourth. Those of the fifth and twelfth are mere nodules, while that of the thirteenth vertebra differs from all the others in the cervical region, inasmuch as it presents the form of a well-marked bony plate which is quadrilateral in form and closely resembles the spines of the dorsal vertebræ.

The following variations in respect of the spinous processes of the cervical vertebræ occur in different species. In *Eudyptes chrysocome* from the Falkland Islands the spinous process of the fifth vertebra is of large size. In *Spheniscus demersus*, *Spheniscus magellanicus*, *Spheniscus mendiculus*, and *Pygosceles* the fifth and sixth vertebræ have well-developed spines. In *Spheniscus minor*, *Pygosceles*, and *Aptenodytes* the quadrilateral spinous process of the thirteenth cervical vertebra is, relatively to the corresponding spines in the dorsal region, of smaller size than in *Eudyptes* and in the other species of *Spheniscus*.

*Comparative Remarks.*—The great peculiarity of the cervical portion of the vertebral column, as a whole, of the Penguins lies in the extraordinary development of its antero-posterior curvatures. These curvatures are two in number. The lower half of the cervical region in the natural condition of the parts describes a curve, the convexity of which is directed forwards, while the upper half forms a curve, the convexity of which is directed backwards. These curvatures are present in all birds, but in none are they developed to the same extent as in the Penguins. So great is the convexity of the lower curve in these birds that the bodies of the cervical vertebræ actually come into contact with, and fill up the angle formed by the two limbs of the clavicle, and consequently both the trachea and