

sternal rib, like the vertebral segment to which it belongs (the tenth), is rudimental and easily lost sight of. It articulates by one extremity with the tenth vertebral rib, and by the other it is attached to the preceding sternal rib, about one inch from the margin of the breast bone. Hence, like the seventh sternal segment, it does not reach the sternum.

I have observed the following variations in respect of the ribs from the arrangement in *Eudyptes chrysocome* above described.

In *Aptenodytes*, *Pygosceles*, and *Eudyptes chrysolophus* the first vertebral rib is destitute of the head and neck, and hence in these species, unlike the others, the first vertebral rib articulates only with the transverse process of the first dorsal vertebra, and not at all with the body of that bone. In *Pygosceles*, moreover, the seventh sternal rib articulates with the lateral margin of the sternum, and in this respect differs from every other species which I have examined, in all of which that rib falls short of the margin of the breast bone. With these exceptions, the arrangement of the ribs is the same in every species.

According to Reid,¹ in the Patagonian Penguin there are only seven sternal ribs. It seems probable that the eighth, like the vertebral segment to which it belongs, had been lost in preparing the skeleton.

THE STERNUM.

The sternum of *Eudyptes chrysocome* from Tristan d'Acunha (Pl. VI. figs. 1 and 2), is quadrilateral in form. Its length is twice as great as its breadth. The body of the bone, as distinguished from the keel, is nearly uniformly convex on its lower surface, except towards its lateral margins, where there is a deep longitudinal groove, bounded on the outer side by an oblique ridge, which, commencing at the lateral border of the bone passes obliquely backwards and inwards, and separates the groove in question from the external xiphoid process. This process nearly equals in length the undivided portion of the bone, from the median portion of which it is separated by the posterior sternal notch, and is prolonged backwards in the recent state by a curved cartilaginous bar, the extremity of which nearly touches its fellow of the opposite side. The posterior sternal notches are two in number, and extend forwards from the posterior border of the bone to midway between the latter and the anterior border of the sternum. They are bounded externally by the external xiphoid processes, and in the recent state are filled up by fibrous membrane. The posterior border of the middle xiphoid process, lying between the sternal notches, is somewhat excavated by a slightly-marked V-shaped notch.

The anterior border of the body of the sternum is prolonged externally into two well-developed "costal processes." These are quadrilateral in form, flattened from above downwards, and project obliquely outwards and forwards. Their lower surfaces are rough

¹ Proc. Zool. Soc., 1835, p. 134.