

remarkable attitude of the Penguin when on land ; by the presence and arrangement of the transverse cloacal muscle ; by the great strength of the muscles which act at the shoulder joint, that is, upon the wing as a whole ; by the peculiar disposition of the brachialis internus muscle ; and by the almost complete atrophy of the muscles which act upon the forearm and hand, the last-mentioned peculiarities being associated with the alteration in function of the wing, and its conversion from an instrument of aerial to one of aquatic locomotion. In respect of the muscles of the leg, the Penguins do not differ essentially from other Palmipedes.

Passing to the peculiarities of the arterial system of the Spheniscidæ, we find that these are no less characteristic of the group than are those of the bony and muscular systems. They consist in (a) the presence of two common carotid arteries of equal size, symmetrically disposed on either side of the middle line ; (b), the peculiar mode of distribution of the subclavian artery, which breaks up into an axillary and brachial rete mirabile from which branches are derived for the supply of the forearm and hand ; (c) in the absence of the sciatic artery as a direct branch of the abdominal aorta, and its substitution by a branch of the crural artery.

The venous system of the Penguins is characterised by the presence of two jugular veins of equal size, placed symmetrically on either side of the neck ; by the junction of the sciatic with the crural vein, instead of with the inferior vena cava ; and by the presence of a single vena portæ, which only subdivides immediately before it enters the liver.

The digestive organs of the Spheniscidæ present fewer characteristic features than do the other systems already referred to. The large size of the buccal papillæ is perhaps more characteristic of the group than is any other portion of their digestive system. The proventricular gland varies in form in different genera, and even in different species of the same genus. As a rule, it is either crescentic in form or presents a completely zonular character. The cæca are small and adnate. The bursa fabricii is usually of exceptionally large size, but both its size and structure vary in accordance with conditions concerning the exact nature of which we are at present ignorant.

The respiratory organs of the Spheniscidæ closely resemble those of other birds in their general arrangement. In one important particular, however, they differ from all with the exception of those of the Procellariidæ. The presence of a tracheal septum, which more or less completely divides the air tube into two lateral chambers, is met with only in the Spheniscidæ and in the Procellariidæ. This septum is usually but not constantly present in the Spheniscidæ. I found it in all the forms which I examined, with the exceptions of *Eudyptes chrysocome* from Tristan d'Acunha, and *Spheniscus minor*. The occasional absence of a tracheal septum, therefore, shows that this septum, *per se*, cannot be considered as a thoroughly and constantly reliable anatomical character of the group of Spheniscidæ, any more than of the Procellariidæ.