SUMMARY AND CONCLUSION.

Before drawing this memoir to a close, it may be convenient that I should briefly summarise the leading peculiarities of the Penguins as compared with other birds, and direct attention to the principal facts contained in the foregoing pages.

From what has gone before it appears that the Spheniscidæ constitute an exceedingly well-defined group of birds, every member of which is characterised by the following skeletal features.

In respect of the axial skeleton, the cranium is truly schizognathous, and is chiefly remarkable for the great development of the transverse temporal crest, which separates the occipital from the temporal region of the skull. This crest, developed to some extent in all the members of the group Spheniscidæ, is more pronounced in certain genera than in others, being more strongly marked in *Spheniscus* than in either *Eudyptes* or in *Aptenodytes*, and more so in the former than in the latter genus.

The vertebral column of every member of the group is characterised (*a*) by the presence in the cervical region of well-developed sigmoidal curves, which are more pronounced than in other birds, and are doubtless correlated with the peculiarly erect attitude of the Penguins when on land; (*b*) by the opisthocœlous character of the dorsal vertebræ, a character which, judging from the frequency of its occurrence in the two groups, is more truly reptilian than avian; (*c*) by the mobility of the dorsal vertebræ upon one another, and the absence, even in the adult, of that complete anchylosis between the dorsal and lumbo-sacral vertebræ on the one hand, and of the latter with the pelvic bones on the other, which obtains in the majority of birds.

In respect of the appendicular skeleton, we find the bones of the wing in the Spheniscidæ modified in accordance with the alteration of function of that organ, and its conversion from an instrument of aerial to one of aquatic progression. These modifications are manifested in the enormous size of the scapula, which thus affords attachment to the powerful muscles of the shoulder joint, that is, to those muscles which act upon the wing as a whole; in the great strength of the coracoid bone, which in *Spheniscus* and in *Eudyptes* is perforated by a foramen for the transmission of the nerve to the pectoralis medius muscle; in the lateral compression of all the bones of the wing, a character which obtains among certain other diving birds, but which only reaches its maximum in