

in different members of the group of Spheniscidæ, it may be useful to summarise the distinctive characters of that group, so far as these muscles are concerned, by a brief enumeration of the peculiarities which the muscles present in the Spheniscidæ, as compared with other birds. This, I feel, I cannot do more effectively or tersely than by quoting the following paragraph from the oft-referred to monograph on the Osteology and Myology of the Spheniscidæ of MM. Gervais and Alix.

In translating this paragraph I have, for the convenience of future workers in the same field, inserted within brackets the synonymes used in the foregoing pages to designate the muscles referred to by MM. Gervais and Alix.

The peculiarities of the muscular anatomy of the wing in the Spheniscidæ may be summed up as follows :—

“The absence of the brachial biceps, brachialis anticus, pronator teres, pronator quadratus, short muscles of the thumb, and of the costal portion of the tensor membranæ axillaris (dorsal cutaneous) ; the atrophy of the infra-spinatus, and the coincident absence of a humero-scapular bone ; the atrophy of the extensors and flexors of the hand ; the feeble development of the cubitalis anterior (flexor carpi ulnaris) the proximal extremity of which does not pass round the epitrochlea and is not provided with a sesamoid ; the insertion of the angularis (levator anguli scapulæ) into the deeper surface of the scapula ; the great development of the trapezoid fascicle (portion A.) of the latissimus dorsi, its termination by means of a separate tendon, and the presence of a fibrous ring through which that tendon passes along with that of the latissimus dorsi proper (portion B.) ; the presence of an external fascicle (first head of triceps) belonging to the long portion of the triceps arising from the clavicle, and the great strength of that fascicle ; the presence of two large sesamoid bones behind the elbow joint, of which one receives the tendon of the vastus internus (third head of triceps), and the other those of the vastus externus (fourth head of triceps) and of the long head (second head of triceps) ; the disposition of the short flexor of the forearm (brachialis internus) ; the great strength of the accessory subscapular muscle (coraco-brachialis) ; the adhesion to the middle pectoral (pectoralis medius) of the coraco-brachialis (pectoralis minor) which in other birds does not reach the sternum ; the large size and thickness of the great pectoral (pectoralis major), composed of very oblique as well as of transverse fibres ; its insertion into the inner surface of the humerus, and the strength of its accessory cutaneous muscle (muscle des parures) ; the enormous strength of the middle pectoral (pectoralis medius), and its division into two parts as in the Gallinacæ and Tinamidæ, a character which distinguishes the Spheniscidæ from all Palmipedes, at the same time that it is common to the Grebes, Rails, and wading birds in general.

“It is necessary to observe, on the other hand, the development of the great abductor of the thumb (extensor metacarpi radialis brevis), as well as of the adductor of the hand (flexor brevis metacarpi), characters which approximate the Spheniscidæ to the Ostriches.”