

rib. Gervais and Alix found the muscle in *Eudyptes chrysolophus* arising from the transverse process of the last cervical vertebra, as well as from the outer surfaces of the first, second, third, and fourth ribs. According to the last-named authors, the muscle consists of five distinct fascicles. In no species of Penguin have I observed more than four.

(b) MUSCLES INSERTED INTO THE HUMERUS.

1. *Pectoralis major*.

*Grand pectoral*, Vieq d'Azyr, 1772, p. 623, No. 1.

*Grand pectoral*, Cuvier, 1805, vol. i. p. 277, No. 1.

Described by Merrem, p. 152, No. 1.

*Der grosse Brustmuskel*, Wiedemann, Bd. ii. p. 82.

*Pectoralis major*, Tiedemann, p. 305, No. 1.

*Pectoralis major*, Heusinger, Bd. vii. p. 183, No. 1.

*Grand pectoral*, Meckel, tom. vi. p. 34, No. 8.

*Der grosse Brustmuskel*, Schoepss, p. 108, No. 15.

*Pectoralis major*, Reid, 1835, p. 140.

*Pectoralis major*, Rolleston, 1868, p. 624.

*Pectoralis major et minor*, Selenka, Bd. vi. p. 121, Nos. 46 and 47.

*Grand pectoral*, Gervais and Alix, 1878, p. 24.

*Attachments*.—The pectoralis major is an extremely powerful muscle. It arises from the outer surface of the clavicle below the shoulder joint, from the outer surface of a strong aponeurosis attached to the clavicle, sternum, and coracoid bones, by means of a linear origin from the whole length of the sternal keel, as well as from the fascia which intervenes between the pectoralis major and medius, and by means of a special bundle of fibres from the postero-external, osseo-cartilaginous angle of the breast-bone.

The anterior fibres pass transversely outwards, the posterior outwards and forwards, while the intermediate fibres pass outwards with various obliquities. The anterior clavicular, and neighbouring aponeurotic fibres end on a special tendon, which is attached to the whole length of the anterior or radial margin of the bones forming the wing. This tendon, moreover, expands into an aponeurotic sheath, which covers both surfaces of the wing, and conceals the various tendons, blood-vessels, and nerves met with in the dissection of that organ. The remaining fibres forming the bulk of the muscle terminate on a V-shaped tendon, which is inserted into a special linear depression on the inner surface of the humerus, between the anterior margin and the head of that bone.

*Action*.—The two portions of this muscle have different actions. The anterior fibres when contracting will carry the wing forwards, to a right angle with the trunk, while the posterior fibres by their contraction will carry the wing backwards to produce the effective stroke in swimming through the water. Moreover, by reason of their insertion into the anterior margin of the humerus, they will bring about that rotation of the wing round