

subdivide before entering the substance of the pectoralis major, which they supply. One constant and special branch of this artery applies itself to the outer border of the pectoralis major, by means of which it is conducted as far back as the knee joint, where it breaks up into numerous minute twigs.

The Brachial Artery (Pl. XI. figs. 4 and 5).—The brachial artery in every species of Penguin which I have dissected, differs from that of other birds, inasmuch as it breaks up into a rete mirabile. The artery, as an undivided trunk, does not exceed, even in *Aptenodytes*, $\frac{1}{4}$ th of an inch in length, for before it reaches the axilla it gives off several branches which are distributed partly to the coraco-brachialis muscle, and partly to the shoulder joint. Thereafter the brachial artery passes out of the thoracic cavity, lying between the infra-spinatus muscle and the axillary margin of the scapula above and the pectoralis minor below. Here the parent trunk breaks up into seven or eight separate branches which lie parallel with one another in contact with the inner surface of the humerus. They anastomose freely by means of more or less transversely-arranged communicating twigs. In *Aptenodytes* the vessels composing the rete equal in size that of a digital artery of the human hand. The rete extends from the axilla downwards as far as the middle in length of the humerus. At this point the vessels forming the rete begin to coalesce, and the number of parallel vessels becomes gradually smaller, until opposite the lower end of the humerus there are only two separate trunks. These two vessels run parallel to one another across the inner side of the elbow joint, and may for descriptive purposes be termed the radial and ulnar arteries, although they by no means resemble the vessels so named in other birds. Having reached the forearm, they lie between the radius and ulna, and are crossed superficially by the tendons in this region. The radial artery then passes from front to back of the wing, through the interosseous space, and thereafter extends along the dorsal surface of the organ as far as the wrist joint. The ulnar artery, rather larger than the radial, after crossing the front of the wrist joint, passes along the palmar surface of the wing as far as the inter-metacarpal space, through which it passes from the palmar to the dorsal surface of the wing, and after inosculating with the terminal branches of the radial artery, is prolonged onwards to the free extremity of the wing.

The following branches are given off from one or other of the vessels just described :—

(a) *The Profunda Artery*.—This branch passes off from the arterial rete close to the axilla. It bends round the posterior border of the humerus, along with the musculo-spiral nerve, and is distributed to the cutaneous structures covering the lower half of the outer surface of the humerus and elbow joint.

(b) *A branch*, which, arising from the commencement of the radial artery, passes transversely outwards and supplies the brachialis internus muscle.

(c) *A branch*, which, arising from the ulnar artery immediately below the elbow joint, passes transversely inwards, and close to the posterior border of the ulna divides into two. Of these one passes upwards and supplies the elbow joint, while the other passes downwards