

pelvis with the femur, withdrawn under that large bony roof, though the ribs do not extend over the pelvis as they do really over the whole shoulder apparatus. As we have already seen, in the preceding section, that this bony roof is formed of the ossification of the skin, it is plain that the position of the four limbs, below its spreading margins, does not alter their homologies, and that on the whole the locomotive members occupy here, as in all quadrupeds, a normal position upon the sides of the backbone, and that they are as usual protected by the general covering of the body, only that here this outer envelope is ossified. It follows, therefore, that Testudinata cannot form a class by themselves. The shoulder is composed of three narrow bones, rather long and straight, meeting in one point, and forming at their junction the *cavitas glenoidalis* for the humerus. Two of these bones, soldered together at right angles¹ as one bone, represent, the upper one, the scapula, the lower, the furcula of the Birds;² the third bone, running backwards, answers to that bone in Birds which, coming from the scapula, rests in a deep, transverse socket of the sternum. Merely to use names already adopted, and without intending to homologize these bones beyond the limits here alluded to, we shall call the first, scapula, the second, acromion, and the third, coracoid process. The scapula, a long, cylindrical bone, is attached by a ligament to the dorsal column just before the first (rudimentary) rib; the acromion, a shorter, somewhat flattened bone, is attached to the sternum by syndesmosis just before the odd bone. The coracoid process runs backward and hangs free between its muscles; its broad, flattened posterior end, and the end of the acromion, are connected by a strong ligament. This coracoid corresponds in its form and in its relations to the other bones of the shoulder apparatus, though not in its attachment to the coracoid of the Saurians, the Crocodiles, and the Birds, in all of which its

¹ There is only one exception known to this general rule. In a skeleton of a North American Emys, in the Anatomical Museum of Berlin, there is on one side of the animal a suture between these two bones. See STANNIUS, *Handbuch der Zootomie*, I., 2d edit., p. 75, note.

² There has been much diversity of opinion about the homology of the three bones of the shoulder apparatus of the Turtles, and the two or three bones which we find in their place in other Vertebrata. BOJANUS, in his great work, *Anatome Testudinis Europææ*, Vindob., 1819, at first mistook the coracoid for the scapula, and called *clavicula* the scapula, together with the acromion (see Pl. viii., O and N); but he soon afterwards corrected himself in the *Isis*. Cuvier,

and most anatomists now living, Stannius, among them, in the second edition of his *Handbook*, have named these bones as we do, while in his first edition, p. 139, Stannius called the acromion, *clavicula*. Duméril and Bibron (*Erpétologie générale*, I., p. 382) call the coracoid, *clavicula*. We see here that for each bone nearly all possible homologies have been supported by some writer or other. This seems to show that there are limits to homologizing. Though we are persuaded that these bones of the Turtles are homologous to those of the Birds in the manner in which we have referred them, one to the other; yet we do not dare to go further, and homologize them at the same time with the bones of the shoulder in Mammalia, and still less with the thoracic arch of Fishes.