

hip bone of quadrupeds, is a broad, but very short truncated cone. The mode of its articulation with the trunk admits of great variety; sometimes it is united by a ball and socket joint, as in the *Curculio* and *Cerambyx*; and it then has, of course, great freedom of motion: at other times the joint is of the hinge kind, as in the *Melolontha*. The trochanter (τ ,) and the femur (F ,) though in reality distinct pieces, are usually so firmly united as to compose only one division of the limb. The articulation of this portion with the haunch is always effected by a hinge-joint. Joints of this description, when formed, as they are in insects, by the apposition of two tubular pieces, are constructed in the following manner. One of the tubes has, at the end to be articulated, two tubercles, which project from the margin, and are applied to the adjacent end of the other tube at two opposite points of its circumference; the line which passes through those two points being the axis of motion. On the side where the flexion is intended to be made both tubes are deeply notched, in order to admit of their being bent upon one another at a very acute angle; and the space left by these notches is filled up by a pliant membrane, which performs the office of a ligament. These articular tubercles and depressions are so adjusted to one another, that the joint cannot be dislocated without the fracture of some of its parts. As the different axes of motion in the successive joints are not coincident, but inclined at different angles to one another, the extent of motion in the whole limb is very greatly increased. Thus, in the cases where the articulation of the haunch with the trunk is a hinge-joint, the axis of this joint and of the next are placed at right angles to each other; so that there results, from the combination of both, a capability in the thigh of executing a circular motion in a manner almost as perfect as if it had revolved in a spherical socket. The principle of this compound motion is the same as that employed on ship-board for the mariner's compass, and other instruments which require to be kept steady during the motion of the ship. For this purpose what are called *gimbals* are used, the parts of which have two axes of rotation, at right angles