

The actions of the tail, which operates as a rudder, are useful chiefly in directing the flight. When the tail is short, this office is supplied by the legs, which are in that case generally very long; and being raised high and extended backwards in a straight line, are of considerable assistance in the steering of the animal. In many birds, as in the wood-pecker, the tail is much employed as a support to the body in climbing trees. The caudal vertebræ are often numerous, but are short and compressed together; they are remarkable for the great development of their transverse processes, and for having spinous processes both on their lower and upper sides. The last vertebra, instead of being cylindrical, has a broad carinated spine for the insertion of large feathers.

Birds could not, of course, be always on the wing; for a great expenditure of muscular power is constantly going on while they support themselves in the air. Occasional rest is necessary to them as well as to other animals, and means are accordingly provided by nature for their mechanical support and progressive motion while on land.

The anterior extremities having been exclusively appropriated to flight, and constructed with reference to the properties of the atmosphere, the offices of sustaining and of moving the body along the ground must be intrusted wholly to the hind limbs. The centre of gravity, before sustained by the wings, must now be brought over the new basis of support formed by the feet; or rather, as it is placed far forwards, the feet must be considerably advanced so as to be brought underneath that centre. But as the bones of the posterior extremity have their origin from the remote part of the pelvis, which is elongated backwards, at a considerable distance from the wings, it became necessary to lengthen some of their parts, and to bend their joints at very acute angles. We accordingly find that while nature, in the formation of the limb, has preserved an accordancy with the vertebrated type, both as to the number of pieces which compose it, and as to their relative situations, she has devi-