

which have the feet placed very far back, cannot use them for walking.

183. The more numerous and the more widely separated are the points of support, the firmer an animal stands. On this account, quadrupeds are less liable to lose their balance than birds. If an animal has four legs, it is not necessary that they should have a broad base. Thus we see that most quadrupeds have slender legs, touching the earth by only a small surface. Broad feet would interfere with each other, and only increase the weight of the limbs, without adding to their stability. Birds are furnished with long toes, which, as they spread out, subserve the purpose of tripods. Moreover, the muscles of the toes are so disposed that the weight of the bird causes them to grasp firmly; hence it is enabled to sleep standing in perfect security upon the roost, without effort.

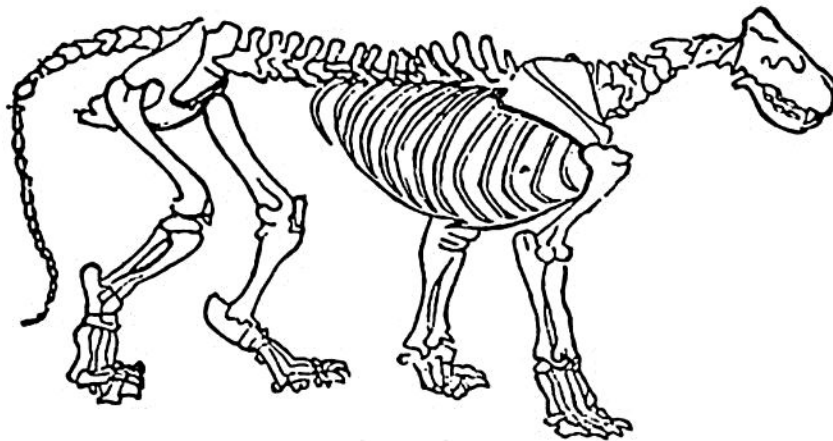


Fig. 46.

184. In quadrupeds, the joints at the junction of the limbs with the body bend freely in only one direction, that is, towards the centre of gravity; so that if one limb yields, the tendency to fall is counteracted by the resistance of the limbs at the other extremity of the body. The same antagonism is observed in the joints of the separate limbs, which are flexed alternately in opposite directions. Thus the thigh bends forwards, and the leg backwards; while the arm bends