

and they act, indeed, in the same manner, and on the same principles.

§ 8. *Progressive Motion of Insects on Land.*

THE actions of the limbs of insects in walking are quite different from what they are in swimming, and are very similar to those of the caterpillar, in which we have seen that the motions of the anterior and posterior legs on one side are combined with that of the middle one on the other side; and the two sets of legs are moved alternately. In consequence of their relative positions with the trunk, the anterior legs are advanced by the extension, and the posterior legs by the flexion of the corresponding joints. When the feet have fixed themselves on the ground, the contrary actions take place, and the body is brought forwards. During this period the legs which compose the other set are called into play, and are advanced; and the same succession of actions takes place with these as with the former. This can easily be seen when the insect walks very leisurely; but in a more quickened pace, the succession of actions is too rapid to be followed by the eye.

The action of leaping is performed by the sudden extension of all the joints of the limb, which are previously folded as close as possible. The joints principally concerned in this action, are those of the thigh and tibia, as they furnish the longest and most powerful levers. Preparatory to the effort, the tibia is brought down as close as possible to the ground, by bending it over the tarsus; and the thigh also is bent upon the tibia, so as to form with it a very acute angle. In order to enable it to take this position with most advantage, we find in many of the Coleoptera, that the thigh has a longitudinal groove for the reception of the tibia, with a row of spines on each side of the groove. While the limb is in this bent position, the extensor muscles are violently exerted, and by producing a sudden unbending of this apparatus of folded springs, they project the whole body,