

much less; but there *is* friction, and therefore the motion would after a time cease.

1. The friction which we shall principally consider is the friction which *prevents* motion. So employed, friction is one of the most universal and important agents in the mechanism of our daily comforts and occupations. It is a force which is called into play to an extent incomparably greater than all the other forces with which we are concerned in the course of our daily life. We are dependent upon it at every instant and in every action; and it is not possible to enumerate the ways in which it serves us; scarcely even to suggest a sufficient number of them to give us a true notion of its functions.

What can appear a more simple operation than standing and walking? yet it is easy to see that without the aid of friction these simple actions would scarcely be possible. Every one knows how difficult and dangerous they are when performed on smooth ice. In such a situation we cannot always succeed in standing: if the ice be very smooth, it is by no means easy to walk, even when the surface is perfectly level; and if it were ever so little inclined, no one would make the attempt. Yet walking on the ice and on the ground differ only in our experiencing more friction in the latter case. We say *more*, for there is a considerable friction even in the case of ice, as we see by the small distance which a stone slides when thrown along the surface. It is this friction of the earth which, at every step we take, prevents the foot from sliding back; and thus allows us to push the body and the other foot forwards. And when we come to violent bodily motions, to running, leaping, pulling or pushing objects, it is easily seen how entirely we depend upon the friction of the ground for our strength and force. Every one knows how completely powerless we become in any of these actions by the *foot slipping*.

In the same manner it is the friction of objects to which the hand is applied, which enables us to hold