

first ; not because it is more powerfully attracted by the earth, for the same force is exerted upon its particles as upon those of a feather, but because it is less resisted in its progress by the action of air.

This attractive force between two bodies varies inversely as the square of their distance, or, in other words, the attraction decreases as the square of the distance increases. Suppose a body to be attracted by another with a force equal to one, at a distance represented by one ; at the distance of two the force will only be one fourth ; at three, one ninth ; and at four, one sixteenth.

With a knowledge of these two laws there will be no difficulty in accounting for the fall of bodies, whether they are raised into the air, and abandoned without force, or whether they are dropped into a mine or well from the surface of the earth. To determine the direction of gravity, it is only necessary to ascertain the line in which bodies fall. The direction of a thread suspended by one end, and having a heavy ball attached to the other, will give the direction of gravity ; for into whatever line it is drawn, it can only result from the action of the force of gravitation ; and hence we determine that the tendency of the power we call terrestrial gravity is to draw all bodies towards the centre of the earth, or, in other words, its direction is in a perpendicular to the surface of still water.

#### CURVILINEAR MOTION.

But if a body be cast obliquely into the air, this tendency is greatly modified ; and although it will be brought to the earth, yet it is deflected from its rectilinear path, and moves in a curve, and is not directed towards the centre of the earth, and consequently it would not even reach the centre, but continue to revolve around it. But why did the stone move in a curve ? why did it not take a rectilinear path to the point towards which it was thrown ; and when that force was destroyed, why did it not fall in a perpendicular line to the earth ? Bodies are made to move in curves when one of the forces by which they are influenced is an accelerating force ; that is, when it causes a body to move faster and faster by its continued action. A certain projecting force is impressed upon a stone when it leaves the hand or the sling ; and it moves with a velocity proportional to the force until the