

mind, because it cannot think two objects there, and says there is but one.

If the axes of the eyes be so directed as to meet a few inches beyond some objects, as at a lamp flame beyond one's finger, then each eye sees an image in a different direction, and the mind, having no difficulty in conceiving two things exactly alike, only so they be not in the same place, says there are two, or we *see* two things, while there is but one.

Again, let the axes of the eyes be conveyed so as to cross a few inches in front of two similar pictures (which must be small enough that the corresponding points on them are nearer to the centres of the pupils) : then the image of the left object in the right eye and that of the right object in the left eye *lie upon each other*, in that nearer plane passing through the intersection of the axes, and the mind says there is but one object. There are two complete and perfect affections in visual sense, each causing perfect perception ; but both perceptions pertaining to the same position in space, and because two things cannot be in the same place at the same time, the mind, notwithstanding the doubleness of perception, forms but one conception. We *see* but one, when there are really two. In the first instant of this experiment there are *four* pictures seen, of which the two middle ones are in an instant brought together so as to seem but one. If now the two side images be cut off by a piece of paste-board, properly placed and having a hole of right size in it, a stereoscope is formed, all but the magnifying power : but it has this remarkable peculiarity, that it reverses everything. It may be called a stereoscope of reversion, and affords much interest.

Once more, change the direction of the optic axes so that they shall meet a few inches farther away than two similar objects or pictures. Take two lighted candles and

read a paper held a few inches behind them. So long as the candles are further apart than the eyes, no special phenomenon is observable ; but when nearer together than the eyes, a third and brighter flame appears mid-way between them. This image lies beyond the lights at the point where the line from the left eye to the left object (flame), meets the line from the right eye to the right object ; where there is projected an image of each of the flames. But as the mind cannot think two things simultaneously in the place it says there is but one—and so we *see* but one. Now if the two side images be cut off by a cardboard, held vertically between the eyes so that the left eye cannot see the right object nor the right eye the left, only the middle image will remain ; which is the one seen in the common stereoscope, only it is without lenses. What then is the use of lenses, if all the appearance of solidity is so easily obtained without them ? The first use is to enable us to use larger pictures, whose corresponding points are farther apart than the pupil centres of the eyes : and the second use is to magnify these larger pictures so that they shall appear still larger and in better detail.

The very common idea that the appearance of roundness and solidity, which is the wonder of the stereoscope, is due to the lenses is an entire mistake. To what, then, is this marvelous effect due ? To answer this we must first answer two other questions. First, when does the mind conceive a thing to be a solid rather than a surface ? And this involves the second, how do we *see distance* ? The mind conceives a thing to be a solid when there is perception of the three dimensions of space. When we look at any object, we perceive length and width directly ; but we get no idea of a solid unless we see a third dimension, distance, or some part further off than others. There are two ways of perceiving distance. First, by appar-