Fig. 10 has been tipped up on edge (Fig. 12), less work is required to tip it back again. For this reason the stone is said to be more stable in the first position than in the second. The reason for this appears from a study of the two figures, 10 and 12. In order to tip it up on end, its center of gravity had to be lifted through the difference in level *ab* (Fig. 10); but in order to tip it back again, its center of gravity had to be raised through the smaller difference in level *cd* (Fig. 12).

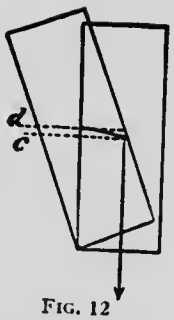

FIG. 12

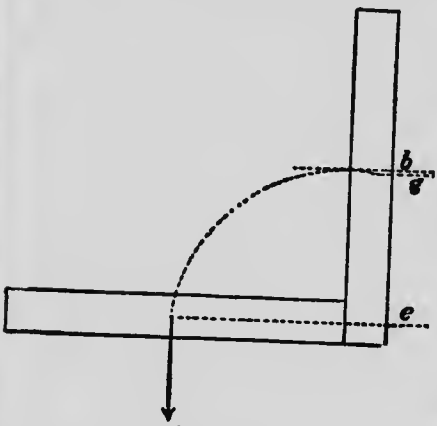

FIG. 13

The stone in Fig. 13 has the same volume and weight as the other, but its base is twice as large and its center of gravity half as high. When lying flat, it is more stable, but when on end it is less stable than the other. In order to tip it up on end, the center of gravity must be lifted through the larger difference in level *eb*, while in tipping it back, the center of gravity rises through the smaller difference in level *gb*. The stability of a body of given weight is therefore greater the larger the base and the lower the center of gravity, because under these conditions the vertical distance through which the center of gravity must be lifted in turning it over is increased.

A block of iron that has the same size and shape as the stone just considered is still more stable than the stone, because it is much heavier than the stone, and therefore a greater weight must be lifted to overturn it. Thus *the stability of a body is greater, the greater the weight and the greater the vertical distance through which its center of gravity must be lifted in tipping it over.*

8. How Gravity Acts. When you stretch a rubber