MATTER AND ITS PROPERTIES.

another; consequently, liquid bodies easily mold themselves to the shape of the vessel that contains them, are *poured* from vessel to vessel, and are easily separated into parts.

But what shall we say of the sand, which, like water, adapts itself to the shape of the containing vessel, and can be poured? Is sand a liquid? and are powders liquids? No, powders are a collection of small *lumps* of solid matter. When powders are poured, lumps of matter roll around one another, as when potatoes are poured from basket to basket. When liquids are poured, *molecules* glide past one another.

It is not so easy to study the characteristics of gases, because we cannot usually see them. But we may be aided by a device similar to that employed to make the movement of water visible.

Experiment 3. Darken a room, and admit, through a small crack or hole, a beam of direct sunlight. You see particles of dust dancing in the path of the light; the motion never ceases. See how easily the motion is quickened by gently waving the hand at some distance from the beam of light.

Experiment 4. Place under the receiver of an air-pump a partially inflated balloon, Fig. 32 (or a Seven-in-one apparatus, with the piston near the closed end of the cylinder, and stop-cock closed), and exhaust the air. The tendency of gases to expand becomes evident.

In gases, fixedness of position of the molecules is entirely wanting, and freedom of motion among themselves is almost perfect. They appear to be in a continual state of repulsion, and consequently have a tendency to expand to greater and greater volumes. They expand indefinitely, unless confined by pressure, while liquids and solids tend to preserve a uniformity of volume.

Liquids do not rise above what is called their surface, and we may have a vessel half full of a liquid; but gases have no definite surface, and there is no such thing as a vessel half full of gas. On the other hand, if gases are subjected to pressure, their volume may be indefinitely diminished; for instance, the air that now fills a quart vessel may be compressed into a pint vessel, or even into less space, if sufficient force is used. The com-

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