solid are then seen to separate, the independent form is lost. The solid becomes a liquid in which the molecules, no longer fixed to any relative position move about one another with active freedom. At this stage the body takes the shape of the vessel that happens to contain it. Lastly, the molecules may be given a mobility so great that not only affinity but all mutual attraction which molecules in the liquid state still preserve is entirely lost. Here the gaseous state sets in. The molecules passing out of the sphere of mutual attraction, simply fly forward according to the laws of motion; they tend to occupy greater and greater space. As a result the gas takes neither shape nor volume save what pressure may impart to it.

Water, according as it is subjected to heat or cold, adopts readily all three states. At a temperature 4° C. it becomes solid in the form of ice. With its loss of heat, the vibration of molecules is lessened. Affinity asserts its power to place these molecules in fixed relative position and the substance becomes a solid with its own definite shape. However, as soon as sufficient heat begins to act, the vibration of molecules becomes rapid, affinity releases its hold, the ice melts and becomes a liquid once more. With the application of further heat, the water boils: its molecules vibrate now so rapidly as to obey no longer their mutual attraction for one another, and the liquid turns into vapor or gas which if not arrested, will disappear altogether into the air. This process is reversed by passiug vapor through different degrees of cold.

We might multiply examples afforded from practical life of the action of heat in bodies. How many explosions and conflagrations may be traced to the action of imprisoned heat. In railway building, spaces have to be left between consecutive rails to obviate accidents liable otherwise to occur by reason of the expansion of the iron from heat in summer or its contraction in winter. In all constructions of iron how carefully must the joints and braces be fitted together to compensate properly for the alternate action of one and the other causes. The household glass or the labratory test-tube, unless carefully heated will fly into bits because of the unequal expansion of its warm and cold parts The blacksmith utilises this effect when in his craft—he first beats the tires