

particle gives motion to all ; but fluidity is characterized, and in fact produced, by the unrestrained motion of the particles among each other. The cohesive force must therefore be stronger in solids than in liquids. Gases and vapours may be almost supposed to result from the destruction of the cohesive force ; it is, however, so neutralized by the principle of heat, that the particles before united by a powerful attraction are now separated by a not less energetic repulsion.

Philosophers are undecided as to the origin of the properties of matter, such as hardness, tenacity, toughness, ductility, and others ; and, in fact, some difficult questions must be decided before any show of certainty can be attached to the theories which have been proposed. There are four hypotheses that may be entertained. We may suppose the properties of any body to result from the varied intensity of the cohesive force ; but then we are required to show the causes calculated to effect an alteration in its intensity, when operating upon elements and compounds, and by what process it can make one substance more ductile than another. If peculiarities of physical character be assigned to the matter itself, it will be necessary to prove that there is an essential difference in character between the matter of one substance and another, and that the properties by which they are distinguished are not attributable to the variety of circumstances in which matter may be placed. To attribute them to the form of the particles, is to invade the elements of all philosophical knowledge. The peculiar combination of particles is sometimes urged as a reason for the properties of matter, and the explanation is recommended to us by many arguments, and supported by a knowledge of facts. Viewed alone, it is an inefficient cause ; but when it is acknowledged that the agents which act upon masses have a similar influence upon particles, nearly all difficulties vanish. These remarks lead us at once to consider the phenomenon of crystallization.

CRYSTALLIZATION.

Frequent mention has been made of crystallization, as a distinguishing property of rocks. Minerals may be formed in irregular shapeless masses, or they may, by the arrangement of their particles, take regular geometrical forms. The effects which are observed in nature may be produced at pleasure in