the laboratory, and consequently the philosopher may estimate the causes which produced the one by a knowledge of those which accomplish the other. When a fluid gradually assumes the condition of a solid, the particles having free exercise among themselves, undisturbed by the motion of the mass, they usually crystallize. Substances do not take forms at random, sometimes assuming one kind of crystal and sometimes another, but have shapes peculiar to themselves. Fluor spar crystallizes in cubes, calcareous spar in rhombohedrons, and other substances have determined structures, so that there appears to be a close connexion between the character of a substance and the form of its crystals. This fact is of great value to the mineralogist and chymist. External characters in general are calculated to mislead, and can never be employed by those who have not been long in the habit of examining mineralogical specimens. Many substances may have the same colour, brilliance, degree of hardness, and other properties, so that these are not peculiarities, though they are, in a limited degree, points of distinction. But all these properties may be lost by a partial admixture with some casual ingredient, or by the circumstances under which the body possessing them was formed. The same remarks cannot with equal propriety be applied to crystallization. An observer may, without doubt, state what a substance is not, by the form of its crystals, though he may not be always able to state what it is, as many substances may take the same form. We may, however, depend with much more certainty upon crystallography than upon the circumstances of colour, hardness, and other properties, which are valuable secondary guides under the direction of the other more applicable principle.

Without entering farther into the discussion of this interesting branch of science, or referring to the discovery made by Professor Michterlich, that various substances have the property of assuming the same crystalline form, and may be substituted for each other in combination without affecting the external character of the compound, we shall at once proceed to mention the difficulties which attend the explanation of this phenomenon. Many opinions have been, and are, entertained as to the cause of crystallization. It was once a favourite theory that the ultimate particles of all matter have a spherical form, and that the structure of a crystal might be attributed to their arrangement and number, altogether inde-