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Limestone in the crystalline state listed
Spath calcaire for the French Calcareous spar for the English
Kalkspath for the Germans

The primitive form of calcareous spar is a rhomboidal parallelepiped that one can consider, to make things easier, as composed of two trihedral pyramids, with rhomboidal planes, joined base to base in the opposite direction. Considered from this point of view the solid angle of the top of the pyramids taken along an

edge and on the middle of the opposite face is 108º 26’ and consequently the one formed by the joining of the two bases and taken in the same way is 71º 34’; the obtuse angles of the rhomb faces are 101º 32’ and the acute 78º 28’,

This rhomboidal parallelepiped is divided or cleft very easily along all its faces and parallel to them. To do that, one has only to place a sharp instrument like, for example, a knife, on the side of one of its faces and in a parallel direction to it and give a blow on the back of this knife. Through this operation, one lifts off from this face a segment varying in thickness, which is merely a collection of varying size of crystalline layers, which have been superimposed on the faces of this rhomboid; and the part of this face, now revealed, is shiny and perfectly smooth, a quality always necessary for one to be sure that the part which has been lifted off has indeed been so following the direction of the superimposed crystalline layers.

If one were to try out this cleavage on all the faces of the rhomboidal parallelepiped, the only result that could be obtained, however far the operation was taken, would be a rhomboid exactly like the one on the faces of which the operation was carried out: a characteristic which shows that indeed this rhomboid is the primitive form of calcareous spar, or the type from which all the other forms that this substance presents are derived.

As for the crystalline layers, which, by being superimposed on all the faces of the crystal make it grow, while continually growing themselves in all directions, it is clear by the manner in which they lift from the crystal, that they

can only be Rhombs having the same angles as these faces; that is to say, the obtuse ones 101º-32' and the acute 78º-28'. And as these layers are themselves made up of the joining of indiscernible molecules, it is also obvious that their depth must be negligible.

I have just said that these layers are made up of the joining of molecules; each of them is, consequently, divisible, in all directions parallel to its 4 sides, and if this division were pushed as far as it could be artificially, or even that imagination could suppose, an immensity of small Rhombs would result, absolutely identical to the layer on which the operation was carried out. But, are they those small Rhombs which are the primitive crystalline molecules of the crystallisation of this substance? Particular reasons, founded on observation, but which would be too long to detail here, make me think that the triangular shape is the one that belongs to the primitive crystalline molecules and that the rhomb molecules are indeed molecules composed sometimes of two, and often even of four, of these primitive triangular molecules.

What is more, the perfect knowledge of the true shape of primitive molecules, on which we can have but a hypothetical opinion, is of only secondary importance in the theory of crystallisation on which the practical rests. The same is not true with the shape of crystalline layers, the increase and decrease of which form the veritable base of this science, but these layers, through the amount that the increase makes them acquire, can be easily grasped by our senses. We can know them, and this knowledge is absolutely necessary to grasp and make us aware of all the different modifications which the primitive form of a mineral substance can experience.

It is principally in the crystalline molecules that resides the whole force of combining like with like which firmly dictates the shape that

the crystal of a substance must take, and traces the limits around which this shape can turn but which it can never pass. They communicate this force of attraction to the layers which they form and, in a number of circumstances, it seems to me certain that they also communicate it to the crystals formed. This molecule is indeed itself a compound of the combination of other principal molecules which are those of the substances of which the one to which it belongs is composed. Once formed, no physical force can split it; it can only be split by chemical forces, which then destroy, by the action of a greater force of attraction, the combination which had formed it. The specific gravity of calcareous spar taken on the primitive transparent crystal, whose popular name is ICELAND crystal, is 27,200. Its constituent parts, according to Bergman, are 55 lime, 34 carbonic acid and 11 water.