and intersecting it in its line of direction. And first, for simplicity, let us suppose the two vibrations of equal intensity (*i.e.*, in both which the molecular excursions on either side of the point of rest are equal), and that their directions form a right angle with each other. Let A B and *a b*, fig. 15, represent two such lines of vibratory movement, C, *c*, their central points, or the positions of rest of the molecules when undisturbed, and C A, C B; *c a*, *c b*; their extreme excursions to and fro. The times of vibration being equal (which is an indispensable condition for the union into one of two distinct luminous rays: as a red ray, for instance, cannot interfere with a violet one), let each be supposed divided into the same number of equal parts (say 360). Then supposing the molecules to set out at the same instant from C and *c*, they will arrive at A *a*, respectively in 90 such units of time, will have returned again to C *c*, in 180; have reached B, *b*, in 270, and again returned to C and *c*, in 360. In so doing, however, their motions are not uniform, but most rapid when traversing the central points, and gradually retarded as they recede from these: so that in equal intervals of time the spaces traversed along the lines C A, *c a*, will be unequal. Then let the whole time (90) of describing C A, be divided into five equal times of 18 each, and suppose that at the end of the 1st, 2d, 3d, 4th, and 5th of these, the molecule has arrived at the points 1, 2, 3, 4, 5. It is demonstrable, then, that the several distances C 1, C 2, C 3, C 4, C 5, of these points from C will be to each other in the proportion of the Sines of 18°, 36°, 54°, 72°, and of 90°