

which the bearings of the work on Science are very fully discussed. The Dialogue treats not only concerning the numerical laws of harmonical sounds, of visual appearances, and of the motions of planets and stars, but also concerning heat, as well as light; and concerning water, ice, gold, gems, iron, rust, and other natural objects;—concerning odors, tastes, hearing, sight, light, colors, and the powers of sense in general:—concerning the parts and organs of the body, as the bones, the marrow, the brain, the flesh, muscles, tendons, ligaments, nerves; the skin, the hair, the nails; the veins and arteries; respiration; generation; and in short, every obvious point of physiology.

But the opinions delivered in the *Timæus* upon these latter subjects have little to do with the progress of real knowledge. The doctrines, on the other hand, which depend upon geometrical and arithmetical relations, are portions or preludes of the sciences which, in the fulness of time, assumed a mathematical form for the expression of truth.

Among these may be mentioned the arithmetical relations of harmonical sounds, to which I have referred in the History. These occur in various parts of Plato's writings. In the *Timæus*, in which the numbers are most fully given, the meaning of the numbers is, at first sight, least obvious. The numbers are given as representing the proportion of the parts of the Soul (*Tim.* pp. 35, 36), which does not immediately refer us to the relations of Sounds. But in a subsequent part of the Dialogue (47, D), we are told that music is a privilege of the hearing given on account of Harmony; and that Harmony has Cycles corresponding to the movements of the Soul (referring plainly to those already asserted). And the numbers which are thus given by Plato as elements of harmony, are in a great measure the same as those which express the musical relations of the tones of the musical scale at this day in use, as M. Henri Martin shows (*Et. sur le Timée*, note xxiii). The intervals C to D, C to F, C to G, C to C, are expressed by the fractions  $\frac{9}{8}$ ,  $\frac{4}{3}$ ,  $\frac{3}{2}$ ,  $\frac{2}{1}$ , and are now called a Tone, a Fourth, a Fifth, an Octave. They were expressed by the same fractions among the Greeks, and were called *Tone*, *Diatessaron*, *Diapente*, *Diapason*. The Major and Minor Third, and the Major and Minor Sixth, were however wanting, it is conceived, in the musical scale of Plato.

The *Timæus* contains also a kind of theory of vision by reflexion from a plane, and in a concave mirror; although the theory is in this case less mathematical and less precise than that of Euclid, referred to in chap. ii. of this Book.

One of the most remarkable speculations in the *Timæus* is that in