The Commentaries of Proclus on the First Book of Euclid's Elements of Geometry Translated by Thomas Taylor (London, 1792) Book I, Chapter 12

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CHAP. XII.

What and how many are the Species of the whole Mathematical Science are, according to the Opinion of the Pythagoreans.

BUT after these considerations, it is requisite to determine concerning the parts of the mathematical science, what, and how many they are. For it is just, after speculating its whole and entire genus, to consider the differences of its more particular sciences, according to their species. The Pythagoreans²¹, therefore, thought that the whole mathematical science should receive a fourfold distribution, attributing one of its parts to the how-many, but the other to the how-much; and they assigned to each of these parts a twofold division. For they said, that discrete quantity, or the how-many, either subsists by itself, or must be considered with relation to some other; but that continued quantity, or the how-much, is either stable or in motion. Hence they affirmed, that arithmetic contemplates that discrete quantity which subsists by itself, but music that which is related to another; and that geometry considers continued quantity so far as it is immoveable; but spherics contemplates continued quantity as moving from itself, in consequence of its union with a self-motive nature. They affirmed besides, that these two sciences, discrete and continued quantity, did not consider either magnitude or multitude absolutely, but that alone which in each of these is definite from the participation of bound. For sciences alone speculate the definite, rejecting as vain the comprehension of infinite quantity. But when these wise men assigned this distribution, we must not suppose they understood that discrete quantity which is found in sensible natures, nor that continued quantity which subsists about the fluctuating order of bodies. For, I think, the

²¹This division of the mathematical science, according to the Pythagoreans, which is nearly coincident with that of Plato, is blamed by Dr. Barrow in his Mathematical Lectures, p. 15. as being confined within too narrow limits; and the reason he assigns for so partial a division is, "because in Plato's time, others were either not yet invented, or not sufficiently cultivated, or at least were not yet received into the number of the mathematical sciences." But I must beg leave to differ from this most illustrious mathematician in this affair; and to assert that the reason of so confined a distribution (as it is conceived by the moderns) arose from the exalted conceptions these wise men entertained of the mathematical sciences, which they considered as so many preludes to the knowledge of divinity, when properly pursued; but they reckoned them degraded and perverted, when they became mixed with sensible objects, and were applied to the common purposes of life.

contemplation of these pertains to the natural and not to the mathematical science. But because the demiurgus of the universe, employed the union, division, and identity of general natures, together with difference, station, and motion, for the purpose of completing the essence of the soul, and composed it from these genera, as Timæus informs us, we must affirm, that cogitation, abiding according to its diversity, its division of reasons, and its multitude, and understanding itself to be both one and many, proposes indeed to itself, and produces numbers, together with an arithmetical knowledge of these: but it provides for itself music according to a union of its multitude, and a communication and junction with itself; and hence it is that arithmetic excels music in antiquity; since, according to the narration of Plato, the demiurgus first divided the soul, and afterwards collected it in harmonical proportions. Again, thought establishing its energy according to the stability which it contains, draws from its inmost retreats geometry, together with one essential figure, and the demiurgical principles of all figures²²: but, according to its inherent motion, it produces the spherical science. For it is moved also by circles, but abides perpetually the same from the causes of circles. Hence, likewise, geometry precedes spherics, in the same manner as station is prior to motion. But because cogitation itself produces these sciences, not by looking back upon its convolution of forms, endued with an infinite power, but upon the inclosure of *bound* according to its definite genera; hence they say, that the mathematical sciences take away infinite from multitude and magnitude, and are only conversant about finite quantity. Indeed, intellect has placed in cogitation all the principles both of multitude and magnitude. For since it wholly consists, with reference to itself, of similar parts, and is one and indivisible, and again divisible, educing the ornament of forms, it participates of *bound* and *infinite*, from intelligible essences themselves. But it understands, indeed, from its participation of bound, and generates vital energies, and various reasons from the nature of infinite. The intellections, therefore, of thought, constitute these sciences according to the *bound* which they contain, and not according to an infinity of life; since they bring with them an image of intellect, but not of life. Such then is the opinion of the Pythagoreans, and the division of the four mathematical sciences.

 $^{^{22}\}mathrm{That}$ is, a right and circular line.