The Commentaries of Proclus on the First Book of Euclid's Elements of Geometry Translated by Thomas Taylor (London, 1792) Book I, Chapter 11

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CHAP. XI.

But let us now consider what are the things which may be required of a mathematician, and how any one may rightly judge concerning his distinguishing peculiarities. For Aristotle[17] indeed, says, that he who is simply learned in all disciplines, is adapted to judge of all: but that he who is alone skilled in the mathematical sciences, can alone determine concerning the magnitude of reasons inherent in these. It is requisite, therefore, that we should previously assume the terms of judging, and that we should know, in the first place, in what things it is proper to demonstrate generally, and in what to regard to peculiarities of singulars. For many of the same properties reside in things differing in species, as two right angles in all triangles: but many have indeed the same predicament, yet differ in their individuals in a common species, as similitude in figures and numbers. But one demonstration is not to be sought for by the mathematician in these, for the principles of figures and numbers are not the same, but differ in their subject genus. And if the essential accident is one, the demonstration will also be one[18]: for the possession of two right angles is the same in all triangles, and that general something to which this pertains is the same in all, I mean triangle, and a triangular reason. In the same manner, likewise, the possession of external angles to four right ones, not only pertains to triangles, but also to all right-lined figures[19]; and the demonstration so far as they are right-lines, agrees with all. For every reason brings with it, at the same time, a certain property and passion, of which all participate through that reason, whether triangular, or rectilinear, or universally figure. But the second limit by which a mathematician is to be judged is, if he demonstrates according to his subject-matter, and renders necessary reasons, and such as cannot be confuted, but are at the same time neither probable, nor replenished with a similitude of truth. For, says Aristotle, it is just the same to require demonstrations from a rhetorician, and to assent to a mathematician disputing probably; since every one, endued with science and art, ought to render reasons adapted to the subjects of his investigation. In like manner also, Plato in the Timæus, requires credible reasons of the natural philosopher, as one who is employed in the resemblances of truth: but of him who

[17] In I. De Partib. Animalium, et in primo Ethic, cap. iii.

[18] See more concerning this in the Dissertation

[19] [DRW—Strictly speaking, to those right-lined figures that are convex.]

discourses concerning intelligibles, and a stable essence, he demands reasons which can neither be confuted nor moved. For subjects every where cause a difference in sciences and arts, since, if some of them are immoveable, others are conversant with motion; and some are more simple, but others more composite; and some are intelligibles, but others sensibles. Hence we must not require the same certainty from every part of the mathematical science. For if one part, after a manner, borders upon sensibles, but another part is the knowledge of intelligible subjects, they cannot both be equally certain, but one must inherit a higher degree of evidence than the other. And hence it is, that we call arithmetic more certain than the science of harmony. Nor must we think it just that mathematics and other sciences should use the same demonstrations; for their subjects afford them no small variety. In the third place, we must affirm, that he who rightly judges mathematical reasons, must consider sameness and difference, what subsists by itself, and what is accidental, what proportion is, and every consideration of a similar kind. For almost all errors of this sort happen to those who think they demonstrate mathematically, when at the same time they by no means demonstrate, since they either demonstrate the same thing as if different in each species, of that which is different as if it were the same: or when they regard that which is accidental, as if it were an essential property; or that which subsists by itself, as if it were accidental. For instance, when they endeavour to demonstrate that the circumference of a circle is more beautiful than a right line, or an equilateral than an isosceles triangle. For the determination of these does not belong to the mathematician, but to the first philosopher alone. Lastly, in the fourth place, we must affirm, that since the mathematical science obtains a middle situation between intelligibles and sensibles, and exhibits in itself many images of divine concerns, and many exemplars of natural reasons, we may behold in it three kinds of demonstration[20], one approaching nearer to intellect, the second more accommodated to cogitation, and the third bordering on opinion. For it is requisite that demonstrations should differ according to the varieties of problems, and receive a division correspondent to the genera of beings, since the mathematical science is connected with all these, and adapts its reasons to the universality of things. And thus much for a discussion of the subject proposed.

[20]Since number is prior to magnitude, the demonstrations of arithmetic must be more intellectual, but those of geometry more accommodated to the rational power. And when either arithmetic or geometry is applied to sensible concerns, the demonstrations, from the nature of the subjects, must participate of the obscurity of opinion. If this is the case, a true mathematician will value those parts of his science most, which participate most of evidence; and will consider them as degraded, when applied to the common purposes of life.