

Iamblichus, *De communi mathematica scientia* xxiii

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That the Pythagoreans did not make further mathematical advance in vain, but rather for the life that uses necessities, some of the causes of this by several means, a record.
[6.21-24]

Further, the fact that it was not at all in vain that Pythagoras transformed mathematical philosophy into a scheme of liberal education and that he made great advances in them both in the number of the proofs and in the precision of the demonstrations, and that he practiced them to a degree beyond the use of the necessities of life, it is easy to understand from the following [70.1-7].

For if we acquired any seed and principle of this kind of cognition from which, having previously accepted verbally the kind of science it is we precisely observed what sort of thing its nature is, this has not come about in us from any other source but from them [70.7-11]. And again the power of the science established it more clearly by the proper arguments in the demonstrations about them [70.7-12].

Moreover it is the understanding of these things that has corrected us when we were persuaded by many of the appearances, clearly establishing the truth about them, however it may be [70.13-16]. **But most of all we participate in an observation both of an independent man and in harmony with philosophers by first being in community with them; for what is proper to each one is what is similar in nature, and for the independent man the master end of the activity in accordance with his proper way of life has its reference to himself and to nothing else external; it exists in the sciences previously mentioned, because they are observational, and it also exists in the first sciences, because the learning of them occurs first in order in the time of youth, without further need of the kind of induction that naturally arises through a habit formed out of the particulars [70.16-26]. And if it is necessary to attribute to this person too the name that is proper to his passion (as with the desires proper to other people, which are named for a predilection for one kind of thing), the philosopher seems to have a drive for a certain science that is prized for itself, and not on account of anything else resulting from it [70.26-71.4].**

For some of those who wish to advance them would not seem to assign to them the appropriate rank, when they assert that we need to create understanding of them because the training in them is useful for other observational fields [71.4-8]. For those things for the sake of which they encourage us to this are by their nature less akin to the truth, even for those who are accustomed to speaking speeches about them, nor are they in the running in respect of the accuracy of their demonstrations [71.9-12]. And here's a sufficient indication of this: we see them enduring and being trustworthy, practiced continually in the same way by those who take up those fields, but in the others we would discover extremely few demonstrations that are at all like that [71.12-15].

Now then, mathematical philosophy has helped us, both for many of the necessities for life, and also for what are worthwhile for themselves, when we are affluent [71.16-18]. For even among the industrial arts we would discover that no small assistance has come about from them. [71.18-20] And as for natural philosophy, even if some other one were to have a more exalted rank, we would see that it makes use of many of the things that we have seen in the proper demonstrations, which we have established throughout what has been said [71.21-24].

Moreover, having established us as familiar with what is ordered and with order, it would create a certain exhortation as well to virtue and to everything fine [71.24-26]. But not only because of this kind of assistance should anyone appreciate their power, but rather still more for themselves and because of their proper nature [71.26-72.2]. For it is agreed that there are certain sciences that are valued for themselves and not only for what results from them; but this is possible either only or especially for sciences that are observational, because their end is nothing else than the observation [72.2-6].

But we use the same criteria to posit one science as being more valuable than another as we use to judge each one to be valuable [72.6-8]. And we value one science over another either because of its precision or because what it observes is better and more honorable; of these sciences, while everyone would agree with us that it belongs especially to the mathematical sciences among them, there are on the other hand those who assign the seat of honor mentioned to the principles that are first, but they suppose the nature of the principle is proper to numbers and lines and their qualities, because of the simplicity of its substance [72.8-16].

Again, the objects that are observed in the heavens have the most honorable and most divine rank of the things perceptible to us and are naturally cognized by the science of astronomy, which is one of the mathematical sciences; but it would seem to be absurd and in no way to be agreed upon to assert that the philosopher has an affinity with the truth, and also think it necessary for him to seek some other fruit from those kinds of observed objects, which have shared in the highest truth, and, to be a lover of observations, and also to think it right to acquire such sciences as these for something else, sciences which are about the most common things in nature as well as about the most divine of things perceptible to us, sciences which, being full of the most numerous as well as the most amazing observations, have a precision not molded from empty arguments, but are proper and secure from their underlying nature [72.16-73.3].

In general whatever someone would seek to require to belong to those of the sciences which are valuable in themselves, we will find that mathematical sciences share in all of them [73.3-5]. For each of them is about a certain nature, and this is eternal and has observations in itself that are numerous and amazing, according to the rank of the proper qualities and according to the distance from the assumption made on the basis of perceptible objects [73.5-9].

Moreover, taking the principles of the demonstrations to be cognizable and in themselves trustworthy, they create the syllogisms about them through them, so as to be a paradigm for those who wish to infer the demonstrations at all precisely. For this reason it would seem to be fitting for those who think

that the profession of doing philosophy is in itself valuable, and that mathematical theory is proper and akin to philosophy [73.9-17].

So it is probably for all these reasons that the Pythagoreans honored the zeal for mathematics, and coordinated it with the observation of the cosmos in various ways, for example, in including number in their reasoning from the revolutions and their difference, in theorizing what is possible and impossible in the organization of the cosmos from what is mathematically possible and impossible, in conceiving the heavenly revolutions according to the commensurable numbers plus a cause, and in not only determining measures of the heaven according to certain mathematical ratios, and to summarize in constructing the natural science which is predictive on the basis of mathematics, as well as in assigning the mathematical objects before the other observable objects in the cosmos, as being principles [73.17-74.1].

And indeed from these they supplied many demonstrations to the natural sciences and they exhort towards the fine and good in virtue, and most importantly they do astronomy theologically by means of mathematics. [74.1-5]. Hence it is probably for all these reasons they took it amazingly seriously [74.5-6].