

Plato's View on the Importance of Mathematics

Plato (427-347 B.C.) is considered to be one of the great philosophers who contributed much in shaping western philosophy. He was born from an aristocratic family. His early interests were in poetry and politics. He learned philosophy from Socrates, the famous Greek philosopher. As a consequence of the political unrest in Athens that in turn led to the execution of his teacher, Socrates, he abandoned temporarily his political interests and left Athens. In his travels, he got acquainted with the Pythagoreans. From the Pythagoreans, he gained the interest in the study of Mathematics. He then returned to Athens about 385 B.C. and founded his Academy where he was lecturing for the rest of his life.

The Academy was considered one of the main centers of intellectual life at the time. The topics of study in the Academy included philosophy, mathematics and law. The Academy attracted many talented people in Greece. One student of the Academy was Eudoxus of Cindus. He became one of the most able mathematicians at the time. Eudoxus gained fame from his work on the theory of proportions. He is also considered by many as the one behind the idea of the method of exhaustion.

Plato's contributions to mathematics were focused on the foundations of mathematics. He discussed the importance of examining the hypotheses of mathematics. He also drew attention toward the importance of making mathematical definitions clear and precise as these definitions are fundamental entities in mathematics. Another indirect contribution of Plato was the important role he played in encouraging and inspiring people to study mathematics. In the Academy, he proposed many mathematical problems and encouraged the students of the Academy to investigate. This led to the appearance of many mathematicians, like Eudoxus, who contributed in the progress of mathematics.

But why did Plato stress on the study of mathematics. One can find the answer in the seventh book of his masterpiece, *The Republic*, where he stated some of his views on the importance of mathematics.

To Plato, the idea of good is the ultimate objective of philosophy. He thinks that "in the world of knowledge the idea of good appears last of all, and is seen only with an effort; and, when seen, is also inferred to be the universal author of all things beautiful and right." [4, p. 179] To help in understanding and attaining the idea of good, one has to study arithmetic and geometry. These two subjects have two important characteristics that make them valuable in comprehending the idea of good.

The first characteristic that arithmetic and geometry have is that they invite thought and lead the mind to reflect and hence enabling the mind to reach truth. The second characteristic is that the advanced parts of arithmetic and geometry have the power to draw the soul from becoming to beings. To Plato, this is "the true use of arithmetic." And the easiest way for the soul to go from becoming to being is to pursue the study of arithmetic until one is able to see

“the natures of numbers with the mind only.” Also, “arithmetic has a very great and elevating effect, compelling the soul to reason about abstract number and repelling against the introduction of visible or tangible objects into the argument.”[4, p.188] He also thinks that studying arithmetic as an amateur or like a merchant with a view to buying or selling will not help the soul to make this transition from becoming to being.

In addition to these two criteria, Plato thinks that people who are good in mathematics will do well in any other field of knowledge: “those who have a natural talent for calculation are generally quick at every other kind of knowledge; and even the dull, if they have had an arithmetical training, although they may derive no other advantage from it, always become much quicker than they would otherwise have been” and “any one who has studied geometry is infinitely quicker of apprehension than one who has not.”[4, pp. 188-189].

One of the topics of mathematics that Plato drew much attention to was that of irrationals. Plato strongly encouraged the students of the Academy to pursue the study of irrationals. His opinion was that science is incomplete without them and that a comprehensive study of irrationals is necessary to build “a coherent and universal philosophy free of the difficulties that wrecked the Pythagorean system.”[3, p.95].

One, thus, observes that, in Plato’s view, mathematics has a philosophical importance. Mathematics is a tool that helps and trains the mind to think. This process of thinking will then help the mind to understand and acquire the idea of good, which is the ultimate aim of philosophy. Plato did not deny the important applications of mathematics in people’s daily life. But, to Plato, the philosophical importance of mathematics is more important and more rewarding as it may affect one’s understanding of his being.

References:

1. Boyer, Carl C. and Merzbach, Uta C. A History of Mathematics. Second edition, 1989, John Wiley & Sons, Inc. New York.
2. Heath, Thomas. A History of Greek Mathematics. Vol. 1. 1965. Oxford university press. Oxford.
3. Maziarz, Edward A. and Greenwood, Thomas. Greek Mathematical Philosophy. 1968. Frederick Ungar Publishing Co., Inc. New York.
4. Plato. The Republic. Translated by B. Jowett. 2000. Dover Publications, Inc. New York.

March 14, 2005 (4 Safar, 1426)