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THE ROLE OF MATHEMATICS IN PHILOSOPHY AND RELIGION: THE PYTHAGOREANS

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If you hear a reference to Pythagoras, you probably think of the theorem credited in name to him. Less common knowledge is that the famous $a^2 + b^2 = c^2$ was well known by the Babylonians almost 100 years before Pythagoras' time (500 B.C.), and developed independently by numerous other mathematicians. Interestingly, Pythagoras' most significant historical contributions were his discovery of irrational numbers and the influence on later philosophical and religious thought. Pythagoras founded a school which fostered generations of thinkers who studied the mystical properties of numbers; the ideas of his followers changed the direction of philosophy and influenced the development of early Christianity.

From our westernized standpoint, it may be hard to imagine that religion, philosophy, and mathematics were all once a single discipline. But the origins of these seemingly differently subjects begin together in the Greeks. Pythagoras and his school of followers, the Pythagoreans, greatly influenced the thought of later Greeks, Plato and Aristotle, who are seen as the fathers of Western thought. All subsequent great thinkers reacted to them as they had in turn reacted to the ideas of the Pythagoreans. But who are these mysterious people with such great influence in

mathematical and philosophical history?

Little is actually known about Pythagoras, and the knowledge we do have is obscured by the practice of his followers of crediting him with much of the work that was done within the Pythagorean society. And it was very much a society, rather than an academic school. The Pythagoreans practiced a highly structured and secretive cult lifestyle. The Greek society of Pythagoras' time was calling out of a polytheistic tradition, (recall the Mount Olympus and the multitude of Greek gods from Zeus to Athena) and it was the redirection from polytheism to monotheism that Pythagoras and his followers are credited with. The Pythagoreans believed that there was unifying aspect of the universe and that "all was number." Philosophers reacted to this shift from understanding the world as "multitudes" in the image of the many Greek and Roman gods to an understanding of continuity and "oneness."

In the history of religious thought, the virtues of Plato and his student Aristotle are thought to define the development of Christianity. They, and most early Christian scholars and saints like St. Justin develop their thought out of the Pythagorean tradition. It was the Pythagoreans' perception of the

world "as one" through the magical harmony of numbers that influenced later religious and philosophical thought. The common ancestor of religion and mathematic thought may surprise us; it is easy to limit math to "the tangible" and the concrete, and view religion as existing only in the realm of faith. But the Pythagoreans had faith in numbers to explain the harmony they saw in the world, and devoutly studied mathematics and the properties of numbers, especially their discovery of the mysterious property of irrationality that Pythagoras saw in the number square of two.

Surprised by the shared roots of these seemingly unrelated subjects? Perhaps not. Religion, philosophy, and math are just different means of understanding the world around us. Our deeply secularized western society delegates religion out of the public and into the private sphere, sometimes making it difficult to imagine a time when religious and scientific thought were one. As a math student I know that for me faith usually has little to do with math until the night before a big exam. But the mystical lifestyle of the Pythagoreans allowed them to study math and religion as one. ✕