Pythagoras

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What do we really know about Pythagoras. In the J.W.¹s lecture we are informed that he, along with certain Egyptians was a philosopher. That they were a society with secrets and were bound by oath never to reveal them. Pythagoras was born in the Greek city of Samos. He is often described as the first pure mathematician and is an extremely important figure in the development of mathematics. Yet we know very little about his mathematical achievements. Unlike many later Greek mathematicians, where at least we have some of the books which they wrote, we have nothing of Pythagoras's writings. The society which he led, half religious and half scientific, followed a code of secrecy. As a child Pythagoras spent his early years in Samos but also traveled widely with his father. He was well educated, learned to play the lyre, studied poetry and could recite passages from Homer. Around 535 BC Pythagoras went to Egypt, there he was accepted into the priesthood. It is not difficult to relate many of Pythagoras's beliefs, to the customs that he came across in Egypt. For example the secrecy of the Egyptian priests, their refusal to eat beans, their refusal to wear clothes made from animal skins, and their striving for purity. These were all customs that Pythagoras would later introduce to his followers. Under the Egyptians, Pythagoras furthered his knowledge of geometry. In 525 BC Cambyses II, king of Persia, invaded and captured Egypt. Pythagoras became a prisoner and was taken to Babylon. While there he associated with the Magi, was instructed in their sacred rites and learned about a very mystical worship of the gods. He also reached the height of perfection in arithmetic, music and the other mathematical sciences taught by the Babylonians. In about 520 BC Pythagoras left Babylon and returned to Samos where he founded a school which was called the Semicircle of Pythagoras. This was a forum in which the Samians held political meetings. Outside the city he made a cave the private site of his own philosophical teachings, spending most of the night and daytime there and doing research into the uses of mathematics. Around 518 B.C.,Pythagoras left Samos and went to southern Italy, there he founded a philosophical and religious school in Croton. Pythagoras became the head of the society with an inner circle of followers known as mathematikoi. The mathematikoi lived permanently with the Society, had no personal possessions and were vegetarians. They were taught by Pythagoras himself and obeyed strict rules. The beliefs that Pythagoras held were as
follows: (1) that at its deepest level, reality is mathematical in nature,
(2) that philosophy can be used for spiritual purification, (3) that the body has a soul and can rise to union with God, (4) that certain symbols have a mystical significance, and (5) that all members of the order should observe strict loyalty and secrecy. Both men and women were permitted to become members of the Society. The outer circle of the Society were known as the akousmatics and they lived in their own houses, only coming to the Society during the day. They were allowed their own possessions and were not required to be vegetarians. Of Pythagoras's actual work nothing is known. His school practiced secrecy and communalism making it hard to distinguish between the work of Pythagoras and that of his followers.

Certainly his school made outstanding contributions to mathematics. First we should be clear in what sense Pythagoras and the mathematikoi were studying mathematics. They were not acting as a mathematics research group. There were no 'open problems' for them to solve, and they were not in any sense interested in trying to formulate or solve mathematical problems. Rather Pythagoras was interested in the principles of mathematics, the concept of numbers, the concept of a triangle or other mathematical figures and the abstract idea of a proof. Pythagoras believed that all relations could be reduced to numbers. This generalization stemmed from Pythagoras's observations in music, mathematics and astronomy. Pythagoras noticed that when vibrating strings of say, a lyre, produced harmonious tones that the ratios of the lengths of the strings resulted in whole numbers, and that these ratios could be extended to other instruments as well. In fact Pythagoras made remarkable contributions to the mathematical theory of music. He was an accomplished musician, and used music as a means to help those who were ill. Pythagoras studied the properties of numbers which would be familiar to mathematicians today, such as even and odd numbers, triangular numbers, perfect numbers etc. However to Pythagoras numbers had personalities which we hardly recognize as mathematics today. Each number had its own personality - masculine or feminine, perfect or incomplete. Ten was the very best number as it contained in itself the first four integers - one, two, three, and four [1+2+3+4 = 10] - and 1-2-3-4 written in dot notation formed a perfect triangle. This school, after existing for thirty years, was brought to destruction by a wealthy inhabitant who was denied admission. In revenge he excited the citizens against it. A lawless mob attacked the scholars while at an assembly. They set fir e to the building and dispersed the disciples, burning forty in the process. After the destruction of his school at Croton, Pythagoras fled to Metapontum where he sought asylum from his enemies in the temple of the Muses where tradition says that he died of starvation at age eighty.
Even today Pythagoras, in all his mystery still remains a fascinating character in a long line of mystics and primitive scientists.