

THE 47th PROBLEM OF EUCLID

by: Unknown

Despite its importance, the 47th problem of Euclid is often overlooked in Masonic lectures. The paragraph about Pythagoras is also given little attention. The Masonic legend of Euclid is ancient, but its origins are unknown. The lecture's information on Pythagoras is taken from Thomas Smith Webb's Monitor.

"The 47th problem of Euclid was an invention of our ancient friend and brother, the great Pythagoras, who, in his travels through Asia, Africa and Europe was initiated into several orders of Priesthood, and was also Raised to the Sublime Degree of Master Mason. This wise philosopher enriched his mind abundantly in a general knowledge of things, and more especially in Geometry. On this subject he drew out many problems and theorems, and, among the most distinguished, he erected this, when, in the joy of his heart, he exclaimed Eureka, in the Greek Language signifying "I have found it," and upon the discovery of which he is said to have sacrificed a hecatomb. It teaches Masons to be general lovers of the arts and sciences."

Pythagoras was a learned man who saw God in nature and numbers. He was a leader, teacher, and founder of a school. He was initiated into several orders of Priesthood and traveled, possibly to Egypt and Asia Minor. He enriched his mind in many subjects, particularly math. He may have been the first to work with the 47th problem, known as "The Pythagorean problem," but it's not proven. The claim that he sacrificed a hecatomb is out of character for the Pythagoreans, who were vegetarians and revered all animal life.

It is believed that Pythagoras was born on the island of Samos. According to contemporary Greek accounts, he was a diligent young man who emphasized mental development over physical training, despite being trained as an athlete. He opposed the immoral behavior of the aristocratic lifestyle of his time and was persecuted for it, along with his followers. Aristotle wrote that the Pythagoreans were the first to focus on mathematics, a discipline they significantly improved. They believed that the principles of mathematics were the basis of everything. Eudemos wrote that the Pythagoreans transformed geometry into a liberal science and examined its principles abstractly and intellectually. This statement should resonate with Masons.

According to Diogenes, Pythagoras was the one who achieved perfect Geometry and also discovered the numerical relationships of the musical scale. Proclus also indicates that the Pythagoreans were the originators of the word Mathematics.

There is a belief that Pythagoras sacrificed an ox upon discovering a geometrical diagram, but this claim is based solely on a statement by Plutarch, who likely obtained it from Apollodorus. However, it is important to note that Pythagoreans were adherents of the doctrine of Metempsychosis, which asserts that all souls initially dwell in animals before inhabiting human

bodies. This belief in reincarnation, widely held in the Eastern world, led Pythagoras and his followers to revere all forms of animal life, making it unlikely that they would have engaged in animal sacrifice. Moreover, there is no concrete evidence to suggest that Pythagoras, who was not particularly wealthy, would have been able to afford the cost of slaughtering a hundred cattle to celebrate his discovery of the 47th problem of Euclid.

During Pythagoras' time in 582 B.C., the "47th problem" was not referred to as such. Several hundred years later, Euclid of Alexandria wrote books on Geometry, which included the 47th and 48th problems as the final section of the first book. It is widely believed that Pythagoras discovered the Pythagorean problem or that it was already known prior to his time and utilized by him. Euclid recorded the mathematical knowledge of his era in writing, documenting the science of Geometry as it was then known.

Euclid's "Elements" from 300 years before Christ are still used as the foundation of geometry, even though many geometries have been discovered since. Despite its importance in our Fellowcrafts degree, most men know little of it. A lodge is exceptional if one out of ten can demonstrate the 47th problem of Euclid.

The 47th problem is vital in geometry and most applied mathematics, particularly in engineering, astronomy, surveying, and other problems that involve finding one unknown from two known factors. Euclid stated the 47th problem and its corresponding 48th problem at the end of the first book. The 47th problem states that in every right-angled triangle, the square of the hypotenuse equals the sum of the squares of the other two sides. On the other hand, the 48th problem states that if the square described on one of the sides of a triangle is equal to the squares described on the other two sides, then the angle contained by these two sides is a right angle.

It may seem complex, but understanding a square should come naturally to Masons. As per our teachings, a square is a right angle or a quarter of a circle, equivalent to an angle of ninety degrees. For those who need a refresher, the "hypotenuse" is the line that completes a right angle (a square) by connecting the endpoints of the two lines that form it.

Let's use the Masonic square as an example. One arm of the square is six inches long, and the other is eight inches long. If we erect a square on the six-inch arm, it will contain thirty-six square inches (six times six). Similarly, the square erected on the eight-inch arm will contain sixty-four square inches (eight times eight). Together, these squares add up to one hundred square inches.

This matter is commonly referred to as the 47th problem. Although its conception is simple, it is complicated by numerous ramifications in its use. It serves as the foundation of all geometry and is responsible for discovering every unknown from two known factors. It is the cornerstone of mathematics.

Many professionals rely on the 47th problem of Euclid, which Pythagoras may have discovered. For example, an engineer tunneling through a mountain uses it to connect two shafts in the

center, while a surveyor determines the height of a mountain with this problem. Additionally, astronomers use it to calculate the distance of celestial bodies and determine the duration of seasons, years, and cycles. In contrast, navigators use it to determine their location on the seas, predict eclipses and tides, and construct various structures such as roads, bridges, and tunnels.

Explaining why something is true can be difficult, but proving that it is true is easy. If you're wondering why explaining something is true is hard, we can simplify the question by asking why two plus two always equals four and never five or three. The answer is that we have given the result of two plus two a specific name - four. If we called it something else, like "fourness," then the answer would be that two plus two equals "fourness." However, the truth remains the same regardless of the name. The same applies to the 47th problem of Euclid, which states that the sum of the squares of the sides of any right-angled triangle always equals the square of the hypotenuse, regardless of the triangle's dimensions. This problem works out whether the sides are a few inches or several miles long, as it has been demonstrated both through measurement on Earth and mathematical proof.

It's hard for our minds to grasp the idea of a place in the universe where the sum of two and two equals five instead of four, as we understand it. Even in the farthest corners of the universe, we cannot imagine a world where the 47th problem doesn't hold true. Truth is absolute and doesn't depend on time, space, place, world, or universe. We believe that truth is a divine attribute that is omnipresent, and coincides with Divinity. The 47th problem teaches Masons to be lovers of art and science in a general sense. The universality of this mathematical principle shows us the unchangeable nature of natural laws. The third movable jewel of the Entered Apprentice Degree reminds us to erect our spiritual building following the rules laid down by the Supreme Architect of the Universe, as written in the great books of nature, revelation, and our spiritual, moral, and Masonic Trestleboard.

The 47th problem is one of the most important rules laid down by the Supreme Architect of the Universe in His great book of nature. This rule allows us to find the length of any side of a right-angle triangle if we know the other two or determine if the angle is "Right" or not based on the squares of all three sides. The 47th problem enables us to explore the universe and study astronomy. We can measure infinite distances, understand the framework of nature, calculate the positions of countless worlds, and reduce chaos to order through an intelligent understanding of the cosmos. The 47th problem teaches us that "God is always geometrizing," and we should read the great book of Nature through a square.

When viewed in this manner, the creation of the renowned Pythagoras, who is both an ancient friend and brother, becomes an emblem of great significance and importance in Freemasonry. To the initiate, it represents the strength, intelligence, and benevolence of the Great Creator of the Universe. Its simplicity only serves to enhance its mystical quality, making it even more intriguing to comprehend.

The Fellowcraft's degree highlights the importance of studying the seven liberal arts and sciences, with a particular focus on the science of geometry, which plays a significant role in

Freemasonry. In the Third Degree, the study of Geometry becomes even more essential, as it is closely linked to one of Freemasonry's most significant teachings - the understanding of the "All-Seeing Eye."

Listen carefully and look closely. Only those with ears to hear and eyes to see can truly understand the 47th problem and its significance for a Fellowcraft. Through this understanding, you will gain a deeper appreciation for the moral lessons taught by the square and the importance of the "angle of 90 degrees, or the fourth part of a circle" in honoring the Master.