ॐ श्री गुरुभ्यो नमः

The Story of Indian History

2 - The Story of Pythagoras

Jayakumar S. Ammangudi

The Pythagoras theorm is studied by almost every high school or college student all over the world. We have used this theorm of squares of the lengths of sides of the right angled triangle in solving numerous problems in geometry for years.

Pythagoras lived from 570 to 495 BCE, i.e. for about 75 years. Several scholars such as Albert Burk (1) and others say that Pythagoras visited and lived in India where he learned Indian Philosophy and Sciences. Dr. Raj Vedam, in his talks (2) narrates the story of Pyathagoras' visit to India. Burk suggests that he learned in Sourthern India. Raj Vedam postulates that Pythagoras could have studied at Kanchipuram. Even though we are told that Kanchipuram was the capital of the Pallava Kingdom, its history is significantly older.

When Pythagoras returned to Greece, he was called a madman because he had become vegetarian! His diet was predominantly based on nuts, corn and fruit. He set up an education system based on the Gurukulam style of India. Here, Pythagoras occupied the central role of a teacher, like that of an Acharya. He was surrounded by his senior most students, followed by junior students who would be eager to gain expertise in the subject matters. In fact, this Gurukulam style was inherited by his successors Socrates, Plato, and Aristotle. Pythagoras also believed in the Reincarnation (3), i.e. Punarjanma, an idea that was alien to the West, and that would attract persecution from western religious institutions, namely Church.

This raises an important question of why an apparently independent Mathematician and Philosopher, Pythagoras, should visit India for studying. It must be obvious that he knew of India as a source of knowledge. In the USA, the children are taught about Greek religious stories. A look at the Greek Gods and Goddesses reminds us of the concept of AdhiShThaana Devata (presiding Deity) of Hinduism. The resemblance is striking. There are Gods and Goddesses of Sun (Soorya/Aaditya), Sky, Water (Varuna), War, Knowledge (Saraswati), Wind (Vaayu), Prosperity (Lakshmi), Night (Rathri) and others. There are

also similarities between these stories and those of the Puraanaas. The contact between the two regions goes back to the Mycenaean Period (1,600 - 1,000 BCE) (2).

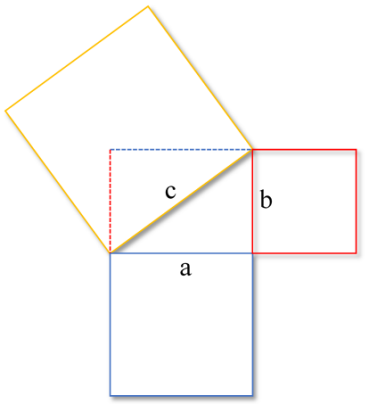
The Shulva-sutras (शुल्व-सूत्राणि) are a compendium of axioms and statements composed by many rishis such as Baudhaayana, Kaatyaayana, Maanava, Aapastambha and others. Ian Pierce (4) states that "these (sutras) include first 'use' of irrational numbers, quadratic equations of the form ax^2= c and ax^2+ bx = c, unarguable evidence of the use of Pythagoras theorem and Pythagorean triples, predating Pythagoras, and evidence of a number of geometrical proofs. This is of great interest as 'proof' as a concept thought to be completely lacking in Indian mathematics." Here is the way Shulva Sutras states this theorem:

दीर्घचतुरश्रस्याक्ष्णया रज्जु: पार्श्वमानी तिर्यग् मानी च यत् पृथग् भूते कुरूतस्तदुभयं करोति ॥

dīrghachatursrasyākṣaṇayā rajjuḥ pārśvamānī, tiryagmānī,
cha yatpṛthagbhūte kurutastadubhayāṅ karoti.

The rope stretched along the length of the diagonal of a rectangle makes an area which the vertical and horizontal sides make together.

In other words: $a^2 + b^2 = c^2$



"Shulva" means a rope or a cord. "Shulva-Sutra" means 'rule of cords' which is another name for geometry. It is thought that the Shulvas were intended to supplement the Kalpa (the sixth Vedanga), primarily serving as instructions for the construction of ritual altars.

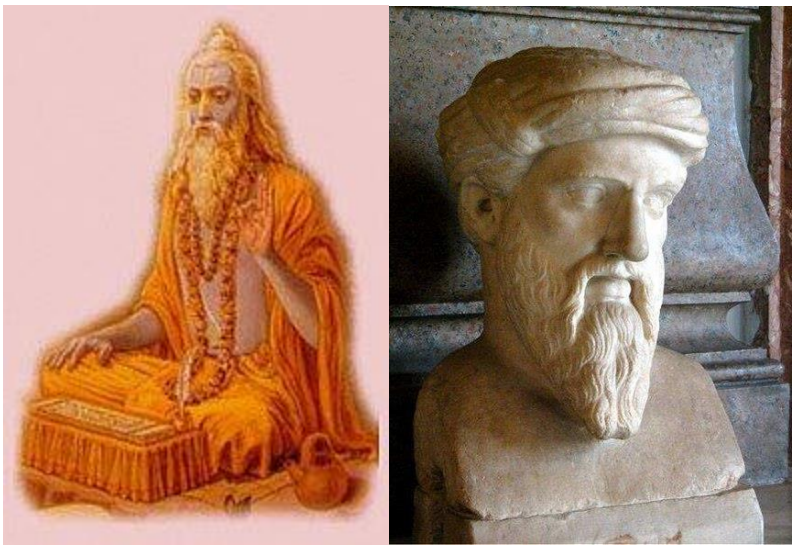


Figure 1: Pythagoras Theorm is also called the Baudhaayana Theorm (5)

Many of the Vedic contributions to mathematics have been neglected or worse. When it first became apparent that there was geometry contained within works that was not of Greek origin, historians and mathematical commentators went to great lengths to try and claim that this geometry was Greek influenced. This phenomenon is called Eurocentrism, one that has robbed Indians of the knowledge of their historical accomplishments.

Pierce observes that it is undeniable that none of the methods of Greek geometry are discernible in Vedic geometry demonstrating that Vedic geometry was independently developed and not in some way borrowed from Greek sources. Dwary (6) states "...They offer a wealth of geometrical as well as arithmetical results." In light of recent evidence and more accurate dating, Seidenberg (in S Kak) (7) claims even more strongly that "...*Indian geometry and mathematics pre-dates Babylonian and Greek mathematics*".

More recently in 2015, Princeton University Professor Dr Manjul Bhargava stated (8) that The Pythagoras theorem 'should either be an Egyptian theorem if you look at the standard of just having an idea about it, an Indian theorem if you're looking for a complete statement of it, or a Chinese theorem if you're looking for the proof of it,'

It is clear that Indians had a big role to play in the invention of the theorem of right-angled triangle. Such observations should inspire Indians to study and research their history. Indian Mathematics and History teachers can strengthen their curriculum and inspire children by narrating stories like these.

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Jayakumar S. Ammangudi

Dr. Jayakumar S. Ammangudi, is Founder of Arsha Vidya Satsanga, and Founding member of Indian History Awareness and Research, both based in Houston, USA. The goal of Indian History Awareness and Research (IHAR) is to revive a healthy Cultural Self-Identity for the people of Sanatana Dharma by providing a forum to highlight suppressed & alternative narratives of India's recent and distant past that Indians can own up and be proud of. He currently teaches Vedanta, Sanskrit and Hindu Culture to children, youth and adults in Coimbatore, and has over 25 years of experience in the Chemical Industry.