

The discovery of a Sumerian clay tablet with cuneiform writing, showing the solar system from the third millennium B.C.

During my visit earlier last year to the Iraqi Museum in Baghdad, at the Sumerian wing, I observed among the numerous historical items there, three clay tablets with cuneiform writing and drawings dating back to around 3000 BC. One tablet depicted the drawing of Geometric-Algebraic equations and shapes such as angled triangles, Euclid Theorem similar to it (**Photos 1, 1a, 1b**); the second is a mathematical tablet and the Pythagorean Theorem resembles it (**Photo 2**) and the third tablet is of the heliocentric drawings of the solar system (**Photo 3**).



Photo 1, Sumerian Clay Tablet showing Geometric -Algebraic Euclid theory about About 3000 BC

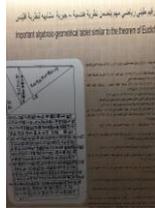


Photo 1a.

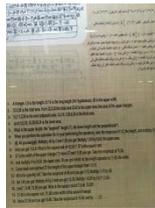


Photo 1b.



Photo 2, Sumerian Clay Tablet (2) of the Geometric -Algebraic Pythagoras theory About 3000 BC



Photo 3, Sumerian Clay Tablet (3) the Solar system About 3000 BC

In Medieval Science and during the middle Ages, Europeans learned the theory of geocentrism: the Earth was motionless in the centre of the universe with all the stars revolving around it. This concept was adopted in Europe for over 1,400 years and anyone who believed otherwise was deemed "foolish and absurd in philosophy, and formally heretical since it explicitly contradicts in many places the sense of Holy Scripture". Nicolas Copernicus (Polish, 1473- 1543) secretly developed and defended the theory of heliocentrism, which claimed that the Earth revolves around the Sun, which was supposedly at the centre of the Universe. At the date of his death, his book titled: *De Revolutionibus Orbium Coelestium* (From the Revolutions of the Celestial Spheres) was published. Copernicus had the opportunity to see a copy within hours of his death. But in 1616 *De Revolutionibus Orbium Coelestium* was finally blacklisted in Europe. Giordano Bruno (Italian, 1548-1600) developed the theory of heliocentrism and showed, in a philosophical way, the relevance of an infinite universe, which has no centre, populated by countless quantities of stars. His free thoughts and writings were deemed blasphemous and he was condemned to be burned alive following a trial that lasted eight years. Galileo (Italian, 1564-1642) was a champion of heliocentrism and Copernicanism and it was controversial during his lifetime, when the majority of people believed in either geocentrism or the Tychonic system (Tycho Brahe in the late 16th century has combined the geocentrism with heliocentrism systems as model of the Solar System). Galileo later defended his views in *Dialogue Concerning the Two Chief World Systems*. He was tried by the Inquisition, found "vehemently suspect of heresy", and forced to recant. He spent the rest of his life under house arrest. Other inspired scientists from other parts of Europe who started to have more freedom of expression for their scientific research and publications revived the heliocentric theory. For example, Johannes Kepler (German, 1571- 1630) found mathematical patterns in the shape of planetary orbits and described planetary motions with greater accuracy with his three laws. And Isaac Newton (British, 1643 – 1727) later explained nearly all these observations elegantly based on laws of gravitational attraction and dynamics.

Who discovered that the Earth Moves Around the Sun and the Heliocentric System?

Copernicus (who was quite fluent in classical Greek) wrote and acknowledged his indebtedness to the ancient Greeks. He was familiar with the extensive Greek ideas of heliocentricity from the Pythagoreans to Aristotle to Aristarchus. He was not the first person to claim that the Earth rotates around the Sun and he attributed the heliocentric theory to Aristarchus of Samos (310 – 230 BC). Aristarchus was an ancient Greek astronomer and mathematician who presented, in Greek, the first known heliocentric model that placed the Sun at the centre of the known universe with the Earth revolving around it. He put the other planets in their correct order of distance around the Sun. A reference in Archimedes of Syracuse (Greek, 287 – 212 BC) book **The Sand Reckoner** describes a work by Aristarchus in which he advanced the heliocentric model as an alternative hypothesis to geocentrism. Aristarchus' astronomical ideas were often rejected in favour of the incorrect geocentric such as Greek philosophers Plato (428-348 BC), and Aristotle (384–322 BC) whose ideas became the accepted version of celestial events. In 140 AD the geocentric model was then catalogued by Ptolemy (90–168 AD) in his masterpiece entitled '**Almagest**' which then became the established belief in the western world for the next 14 centuries. In addition to the Greek influences, Copernicus claims have been influenced by Persian and other Middle Eastern astronomers in the middle Ages. He did not mention this in his work, but some mathematical models which were used to describe the movement of the stars are similar to those established by astronomers, especially by al-Biruni the rotation of the Earth on itself was discussed at the Xth century and school Maragha the XIIIth and XIVth centuries which were translated into Latin. Thus, it is used for decomposing a linear movement in a circular motion which is the same method as the Persian astronomer Nasir al-Din Tusi. Similarly, the pattern of movement of the Moon is almost identical to that of the Arab astronomer, Ibn al-Shatir, who also developed the XIVth century planetary theories similar to those described by Copernicus in the XVIth century. About 3 millenniums before the ancient Greek astronomers, the more ancient Sumerians knew about our solar system and documented it on clay tablets with cuneiform writing and the drawing of the solar system (**Photo 3**). The Sumerian civilisation is considered to be the cradle of human civilisation and the oldest in human history, dating back to over 8,000 years ago. This human settlement and civilisation took place in Mesopotamia. Currently, Mesopotamia is mostly Iraq and stretches into Iran, Anatolia, other parts of Middle East and central Asia. Sumerian culture and civilisation was highly developed. They had established government, schools, social structure, stable food, religion, the arts, mathematics, astronomy, astrology, medicine, technologies and numerous important inventions. They invented a system of writing that used wedged shaped characters called cuneiform and documented all of their records on clay tablets. They invented musical instruments such as the golden harp (**Photo 4**) and produced beautiful jewellery, metal ware, stone ware and textiles.



Photo 4, Sumerian Harp found in the royal cemetery from the tom of the princess in Ur – South of Iraq, dated to the early dynastic period III (2600 – 2370 BC), the Iraqi Museum.

Ur-Nammu wrote the first legal code in Sumer which became the precedent for the much later, and better known, Code of Hammurabi of Babylon. This universal code of legal pronouncements,

presents a good example of the unifying drive of Ur's kings in which the monarch served as the father figure who guided his children along a proper path toward prosperity. They invented the art of metallurgy, made bronze and ushered in the Bronze Age. They invented the first wheeled vehicles and used them for their farm carts and war chariots. They built dams to control flooding and irrigation canals for agriculture and the first to cultivate wheat, barley and other cereals. They produced wines and beer and came up with the term "Alcohol". They kept business accounts and records and had trade. They built boats and traded with the region and India. The Sumerians also essentially invented time in that their sexagesimal system used a number system with the base 60 (like we use base 10). They divided time up by 60s including a 60 second minute and a 60 minute hour, which we still use today. They also divided up the circle into 360 degrees. They had a wide knowledge of mathematics including addition, subtraction, multiplication, division, quadratic and cubic equations, and fractions. This was important in keeping track of records as well as in some of their large building projects. The Sumerians had mathematic formulas for figuring out the circumference and area for different geometric shapes like rectangles, circles, and triangles and **Geometric-Algebraic** equations well before **Euclid Theorem**, as in the clay tablet (**Photos, 1,1a,1b**). They even knew of the **Pythagorean Theorem** long before Pythagoras wrote it down as in the clay tablet (**Photo 2**). It is generally accepted that the first cities and Ziggurats built like pyramid in the world rose in Sumer and, among the most important, were Ur (Uruk), Warka, Eridu, Larsa, Isin, Adab, Kullah, Lagash, Nippur, Nina and Kish. The Sumerians had the first schools, the first proverbs and sayings, the first messiahs, Noah and the Flood stories, **The Epic of Gilgamesh**, (biblical parallels) the incredible similarities between the Sumerian King List and accounts in Genesis, the first love song, the first aquarium, the first legal precedents in court cases, the first tale of a dying and resurrected god, the first funeral chants, and first moral ideas. The modern day practice of checking one's horoscope comes from ancient Sumer and that the astrological signs one is born under were first noted and named. The Sumerian prophet Abraham, the patriarch who left Ur and went and built the two houses of God for humanity: Jerusalem then Macca.

Aramaic speaking Migrants from the south to west of Sumer have largely come and gradually occupied and settled in many parts of Sumer and learned from the Sumerian's civilisation, developed it and established their Empires. These were first the Akkadian then the Babylonians and Assyrians. In the 7th century BC, various Sumerian tribes then named Media's tribes (nowadays called Persians, Kurds and Armenians) came together to form the Median Kingdom, which it remained a Neo-Assyrian vassal. Then between, 616 to 609 BC, King Cyaxares (624–585 BC), allied with King Nabopolassar of the Neo-Babylonian Empire against the Neo-Assyrian Empire, after which the Median Empire took over and stretched across the Iranian Plateau as far as Anatolia, North Africa, Central Asia and North India. Cyrus the Great successfully rebelled against his Medes rulers and established the Achaemenid Empire of Persia in 553 BC. Alexander was victorious against Darius III of Persia and then came the end of the Achaemenid Empire of Persia. Alexander entered Mesopotamia in 331BC and conquered Nineveh, Babylon and Susa. Alexander's settlement of Greek colonists and the resulting spread of the Greek in the east resulted in a new Hellenistic civilization in Mesopotamia in the period (312-139 BC) in city Hatra [West of Nineveh (Mosul) – Iraq].

In the Iraqi Museum of the Hatra - Hellenistic period (312-139 BC) wing, a variety of a large number of historical items belong to this Greek period in Iraq were displayed, as the photos display (**Photos 5-11**).



Photo 5



photo 6



Photo 7



Photo 8



Photo 9



Photo 10

The Hellenistic period (312-139 BC) in city Hatra

Greek goddesses

The god Hercules

Statue of lady the wife of King Sinutruk I



Photo 11

Iraqi Museum in Baghdad 2018

The chronological order highlighted above and the Greeks at Hellenistic period (312-139 BC) in Hatra - Iraq learned and studied the literatures including scientific discoveries made by the existing and advanced civilisation of the Persian-Meds, Assyrians, Babylonians, Akkadians and Sumerians. The Greek astronomer and mathematician Aristarchus (310 – 230 BC) who has presented in Greek the heliocentric model could have lived or spent some time in Hatra – Iraq or either he obtained knowledge and information from other Greek scientists living there about mathematics and the solar system written by the Sumerians and the rest of the civilisations that followed them in Mesopotamia. While the earlier Greek philosophers, such as Plato (428-348 BC), and Aristotle (384–322 BC) and well before the Greeks Hellenistic period in Hatra – Iraq, they only believed in the geocentrism system. If we compare the Heliocentric System presented by Copernicus (**Figure 1**) with the clay tablet drawings of the solar system (Photo 3) we see similarities in the main core of the sun and the 5 orbits containing the planets around it.



Figure 1, The Heliocentric System presented by Copernicus (*De Revolutionibus orbium coelestium*).

The Sumerians discovered the Heliocentric System and it is high time to recognise the historical fact that perhaps what is known popularly as the Copernican System or the Aristarchean System should really be called the "Sumerian System".

Professor Kamal Aziz Ketuly,

Email: kketuly@hotmail.com

Website: www.facebook.com/Kamal.Ketuly