

The History of Astronomy in Ancient Mesopotamia

By Scott Sackrider

The study of Astronomy (which is concerned with the observation of the motions of celestial bodies, and the reduction of these observations to mathematical order) is said to have been instigated by the Chaldeans in Mesopotamia in the fourth millennium B.C where it was blended with religious elements and practiced in the temples. One particularly important observation made by the Chaldeans was the ability to predict with a certain degree of accuracy, the perceptible motion of the planets including periods of apparent retrograde (backwards) motion, helical rising and setting and conjunction with principal stars. They also calculated the times of Earth's Moon's "new" phase as well as lunar and solar eclipses orbit (The Electronic Journal of the Astronomical Society of the Atlantic).



Abraham's boyhood home (Photo by Scott Sackrider)

The Chaldeans would then build idols and temples, such as the Ziggurat of Ur. The structure is a temple to the moon god Sin (or Nanna, as known in Ur). The Ziggurat was constructed in the 21st century BC and completed by King Shulgi.

According to Christianity, Judaism, and Islam, Abraham was a resident of Ur, where his father was an idol maker. The boyhood home of Abraham is partially rebuilt, and stands about 500 meters from the Ziggurat. The Ziggurat itself is solid. What looks like windows are actually "weep" holes to allow moisture to escape.

During the reign of the Babylonians, the study of astronomy and astrology (which is the study of the effects of the movements of celestial bodies on human affairs) was limited to the society's upper class (the priests) as education was restricted to this class by the society's strict caste system. As time went by and the priests began to move further away from the pure science of astronomy into the more vernacular astrology, they began to lose the clarity of their earlier work. The priests used this knowledge as a means of practicing their religion.



The Ziggurat (Photo by Scott Sackrider)

Astronomy began to take the form of pure science during the reign of the Babylonians during the period between the destruction of Nineveh in 607 B.C. and 1 B.C. The Babylonians calculated their months according to the lunar cycle, but since the seasons were ruled by the solar calendar, they formed a luni-solar calendar which was made up of 12 months with an extra 13th month that was added occasionally to keep the years consistent. The construction of this calendar was very important for agricultural purposes, especially in the flood plain agriculture of Mesopotamia, as was the ability to predict floods by astronomical means.

Some of the contributions made by the Babylonian astronomers to this science include the division of the circle into 360 degrees. Babylonians divided each day into 12 divisions each known as a 'kaspu'. The solar kaspu is the distance traveled by the sun in a two hour period that corresponds to 30 degrees. Just as it is done today, the Babylonians used the arc of one degree as a unit of angular space. They advanced this system to divide time into units that correspond to 4 minutes of our time, which is approximately the path taken by Earth in one day of its annual rotation around the sun. The division of our current day into 60 minutes, with each minute composed of 60 seconds is based on the Babylonian sexagesimal (base 60) system that divided the day into 12 hours. This was replaced later on by the Egyptian system that divided the day into 24 hours. There are also some existing records that show that the Babylonians also used a seven-day week system.

The Babylonians were able to predict eclipses and they started their studies in this field on March 19, 721 B.C. In modern theories, the eclipse records of both the Chaldeans and Babylonians are used in the study of long- term variations in the lunar orbit (The Electronic Journal of the Astronomical Society of the Atlantic).