Mesopotamian Astronomy

Mesopotamia, Persia, and the History of Astronomy

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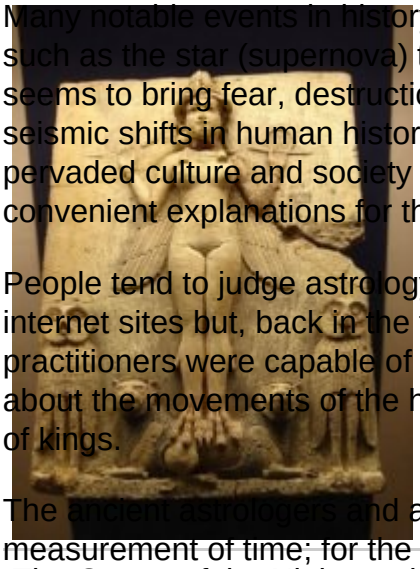
Ever since man first looked up at the stars and asked the question, “Are we Alone?” the history of astronomy has shaped the course of human society, connecting science with the inbuilt human spirituality and sense of wonder at the unimaginable vastness of the cosmos.

Now seen as the domain of loveable eccentrics, such as Patrick Moore, the late, great Carl Sagan, and Brian May, it is easy to forget how the science of astronomy has pervaded nearly every aspect of human history, and oversaw the rise and fall of great civilizations.

The History of Astronomy - Shaping Human History



The Queen of the Night, probably 1792 - 1750 BC, represents an ancient Babylonian goddess. (Public Domain)

Many notable events in history were shaped by conjunctions of stars and astronomic events, such as the star (supernova) that guided the Magi to Bethlehem. Halley's Comet always seems to bring fear, destruction and rebirth in its wake, the portent of doom that caused seismic shifts in human history. Most civilizations practiced ancient astronomy, and it pervaded culture and society much more than in the modern world, where we have convenient explanations for the complexity and stark, harsh beauty of the universe.

People tend to judge astrology by the poorly written, generic horoscopes in newspapers and internet sites but, back in the time of the ancients, it was a genuine proto-science. Astrological practitioners were capable of making meticulous measurements and accurate predictions about the movements of the heavenly spheres, tying them to a pantheon of gods and the fate of kings.

The ancient astrologers and astronomers became instrumental in establishing the measurement of time; for the modern world, with the hectic lifestyle and schedules, time is merely a convenience. For the ancients, where successful agricultural techniques were a matter of life and death, they needed to know exactly when to plant and harvest. Ancient humanity followed the cycles of the seasons and lived close to the natural rhythms of the planet. The Chinese [1] and Indian [2] mystics made their contribution to the history of astronomy, but the Mesopotamians were the masters of ancient astronomy, their sophisticated techniques and observations passing on to the Greeks [3].

Ancient Astronomy and the Sumerians, the Foundation of Civilization

Whilst we can safely assume that humanity developed sophisticated astronomical techniques long before the dawn of recorded history, the history of Western astronomy begins in Mesopotamia. This land, straddling the Fertile Crescent between the Tigris and Euphrates rivers, now lies in Iraq, Turkey, Syria, and Iran. The Fertile Crescent is where civilization began, and was home to the great civilizations of the Sumerians, Babylonians, and Assyrians.

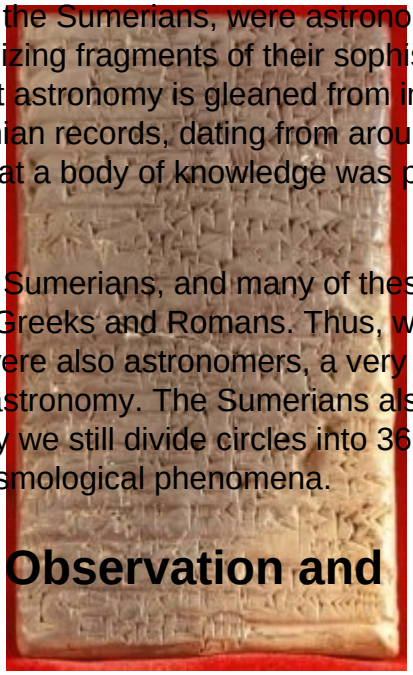
The main Mesopotamian contribution to human history was the creation of written language, using the cuneiform script. This linguistic innovation dates back to between 3500 and 3000 BC, and is one of the reasons why we know so much about their sophisticated astronomy.

To write, the Mesopotamians pressed the ends of cut reeds into wet clay, making the distinctive, cuneiform wedge shaped marks, the basis of their written language. Thousands of these baked clay tablets survive, allowing historians to glean a unique insight of the Mesopotamian life and society and, after many trials and tribulations, were translated.

Map of Mesopotamia (Public Domain)

Historians are sure that the oldest of the civilizations, the Sumerians, were astronomers, but most of their knowledge was lost, leaving a few tantalizing fragments of their sophisticated culture. Our knowledge of their contribution to ancient astronomy is gleaned from indirect transmission to the Babylonian culture. Early Babylonian records, dating from around 1800 BC, use the Sumerian names for stars, suggesting that a body of knowledge was passed down.

The Mesopotamian pantheon of gods began with the Sumerians, and many of these Gods were tied to the planets, a tradition carried on by the Greeks and Romans. Thus, we can make an educated guess that the Sumerian priests were also astronomers, a very common trait in the region and one that defines the history of astronomy. The Sumerians also used the sexagesimal system of measurement, the reason why we still divide circles into 360 sections, a system still used by modern astronomers to plot cosmological phenomena.

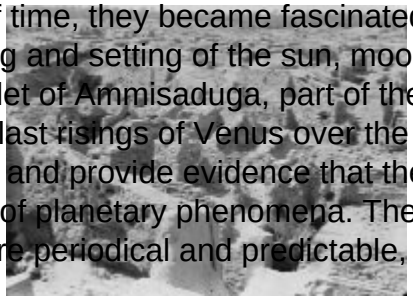


Cuneiform Script Tablet (Public Domain)

Babylonian Ancient Astronomy - Observation and Prediction

The first real insight into the history of astronomy begins with the Babylonians, who used the heavens as their means to establish an accurate calendar, crucial in a region where agriculture depended upon exact dates for planting at the right time. From 1800 BC, they meticulously plotted the movement of the sun and the moon, using them to track the procession of the seasons. The societal class responsible for this were the Chaldeans, priest-astronomers who began to look to the skies for the prediction of events, astrologers as much as astronomers.

Using gnomons and waterclocks to measure the passage of time, they became fascinated by charting the occurrence of celestial events, such as the rising and setting of the sun, moon, and planets. One of their baked-clay tablets, the Venus Tablet of Ammisaduga, part of the Enuma Anu Enlil series of clay tablets, records the first and last risings of Venus over the year. The Enuma Anu Enlil record centuries of observations and provide evidence that the Chaldeans were fully aware of the regularity and periodicity of planetary phenomena. The Babylonians recognized that many cosmological objects were periodical and predictable, and soon used this to predict future events and occurrences.



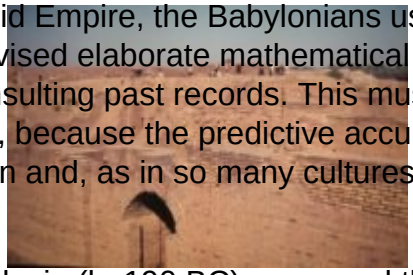
Ruins of Babylon (Public Domain)

The Babylonian input to the history of astronomy increased during the reign of Nabonassar (747 - 733 BC), when the Chaldeans increased the number of accuracy of their observations, discovering that lunar eclipses were locked in to a nineteen year cycle. Other contributions were the naming of the zodiacal signs along the ecliptic plane, which passed into the Roman system and is still used by modern astrologers and astronomers to divide the night sky.

The Babylonians and the Persians - The Zoroastrian Influence On the History of Astronomy

The rise of Persia, under Cyrus the Great, saw a change in the direction of the history of astronomy, as two sophisticated civilizations met. In 539 BC, the forces of Cyrus swept into Babylon and annexed it as part of the Persian Empire. The Zoroastrian magi, fine astronomers in their own right, traded ideas with the Babylonians, and the importance of the region to ancient astronomy grew.

During the reign of the Persian Seleucid Empire, the Babylonians used ‘Goal Year’ tests to predict the motions of planets, and devised elaborate mathematical functions to predict cosmological phenomena, without consulting past records. This must have strengthened the link between astronomy and astrology, because the predictive accuracy of the priests must have seemed magical to the population and, as in so many cultures, astronomy became the foundation of religion.



Babylon Excavation, picture from 1975 (Public Domain)

One notable Chaldean, Selucius of Selucia (b. 190 BC), proposed that the sun lay at the center of the universe, although this heliocentric model would later be rejected by the Greeks. It is believed that he arrived at this conclusion through reasoning and the regularity of tides, although this is conjecture. Certainly, he was the first known astronomer to link the moon and the sun with the height and timing of tides.

Ancient Astronomy Passes to the Greeks - Alexander the Great and the History of Astronomy

Alexander the Great, whilst a man of war, understood the sophistication of the Mesopotamians when he conquered the region, and made this knowledge available to the Greek philosophers, including Aristotle, and went on to influence scholars such as Plutarch, Strabo, and Al-Razi.

It is possible to argue that their predictive techniques were the beginning of a truly scientific method, where scholars make predictions based upon observation. However, the Greeks and the Persians traded and shared ideas for centuries, so there is no clear boundary between the Babylonian astronomers and the Greek philosophers. Alongside Selucius, Strabo mentioned Kidenas, Naburianos, and Sudines as other great Babylonian philosophers.

The Babylonian Legacy and the History of Astronomy

The legacy of the Babylonians does not end there, and their knowledge was preserved by the Persians who would, in turn, pass this on to the Islamic scholars. Thus, because of their influence upon both Eastern and Western astrology and astronomy, the Mesopotamians still influence modern life. From the familiar horoscopes, to the heliocentric model of the universe, the skilled ancient astronomy of the Chaldeans can be found around us, glimpses of a lost, great age. They earn their place in the history of astronomy as the founders of a science that would influence Greek philosophers, create pantheons of gods, and ensure that entire magazines are devoted to daily horoscopes!

Related pages:

Chinese Astronomy [1]

Egyptian Astronomy [4]

Greek Astronomy [3]

Indian Astronomy [2]

Mayan Astronomy [5]

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