ANCIENT MESOPOTAMIA – Science

Frederic Will, Ph.D.

Overview   Innovation and scientific discovery both marked the unusually creative intellectual spirit of the higher cultures of Mesopotamia. While medical science was a blend of empirical work, including early surgery, with what we might call 'religious psychotherapy,' the work put into mathematics and astronomy was aligned with what would be the main discovery directions of those sciences, straight through to our time.

Medicine   Our knowledge of Mesopotamian medicine is limited because we have trouble interpreting, and even reading, the cuneiform tablets on which such medical literature is written. The basic character of this medical practice, which is fully in place by the third millennium B.C.E., and which continues at least two millennia more, is clear: illness is viewed as sin, and healing is the prerogative and responsibility of the doctor. To be more nearly exact, doctors fell into three categories: healing doctors; seers; and exorcists. Only the first of these adopted empirical methods like prescriptions or surgical interventions, while the other two categories, practicing as they did in the temples, took on the challenge of driving away evil spirits, or reciting appropriate prayers. A typical prescription might run like this: 'If a man is sick with a blow on the cheek, pound together fir-turpentine, pine-turpentine, tamarisk, daisy, flour of Inninnu; mix in milk and **beer** in a small copper **pan**; spread on skin, bind on him, and he shall recover.'

Astronomy   Mankind's first record of astronomical--it was what we would now call astrological--observations was due to the Sumerians, and though the Babylonians and Assyrians were eventually to prove to be the greatest of early astronomers, the Sumerians, as in much else--writing, the wheel, the sail--were the ones who got the ball rolling. Both the Babylonians and Assyrians--as we see in the Venus Tablets (1582 B.C.E.) of the Babylonian king Ammizaduga--were able to identity 2000-3000 constellations--e.g. Leo, Taurus, Scorpio, Sagittarius--by the knowledge of whose movements and positions it was made possible for farmers to calculate planting times, and for sailors to calculate nautical positions, with useful accuracy. The movements of Venus, from her positioning as a morning star, to those of an evening star, were analyzed with similar productive consequences for agriculture and shipping. Both the Babylonians and Assyrians acquired an accurate ability to predict lunar eclipses.

Mathematics   From as amazingly early as 8000 B.C.E. the Mesopotamian culture was inquiring into fundamental concepts of mathematics, and in the course of its long development, through to the interventions of Alexander the Great, the culture continued to advance in conceptions not only of basic functions but of higher algebra and geometry. Work of extensive complexity was inscribed on clay tablets, as well as analytical procedures using assumptions basic to us today--a baseline figure of sixty (rather than our decimal system, 10) on which to calculate the seconds in a minute, minutes in an hour, and the 360 degrees of the circle. Such already sophisticated premises had their origins in a millennia old practice of establishing the relations between symbols (numerical symbols eventually) and types and quantities of agricultural products; relationships which were in time to be the groundwork for a numeric system and procedures like arithmetic, in which every sort of agricultural calculation was embedded.

Readings

Neugebauer, Otto, *The Exact Sciences in Antiquity*, New York, l969.

Robson, E., *Mathematics in ancient Iraq: A Social History*, Princeton, 2008.

Discussion questions

To what extent were the needs of agriculture the drivers for the Mesopotamians' great curiosity about scientific thinking?

How closely linked were mathematics and astronomical discoveries in Mesopotamia? Which of the two sciences came first?

Astronomy and astrology were closely related, in the development of Mesopotamian thought. Are they still closely related? Are they both sciences of prediction?