

CULTURES ACROSS THE UNIVERSE AND THE ROOTS OF ARMENIAN ASTRONOMY

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Abstract. It is often proposed that people living in different cultural groups are brought up to perceive the world differently. The perception of celestial objects varies from culture to culture. Prehistoric cultures viewed the sky as the main leader of their life and they connected their fortune and daily life only with the Universe. This article mainly refers to the roots of Armenian Astronomy and how it is until now preserved and reflected on other cultures, especially on their mythology, astroterminology, cultivation, physical mobility, the ability to commune very subtly with nature. Consideration of the position of the earth in relation to the celestial bodies are often used in medicine, and until now it is used in the Indian culture, all this and much else has contributed to the great wisdom of ancient nations, the wealth of their culture and man's place therein and in the Universe, their understanding of the mechanisms of regulation of human life activity and vital potentials are reflection of their culture. Here we prove that mythology is preastronomy and it is the basis of cultures, and that national identities were shaped due to the nations special perception of celestial objects.

1. INTRODUCTION

Individuals raised in diverse cultures can actually sense the Universe differently. Throughout the history humans had always watched the sky and banded it to their culture in form of mythology, religion, folklore and art, later they even used the sky for timekeeping and night navigation. Early astronomy is the study of humankind's early attempts to understand the skies. All people have looked up and wondered about the Sun, Moon, planets, stars, and their complex ballet of motion. Interpretations vary widely among cultures, but often the sky is considered as the abode of gods, where humans can never touch. Astronomy has always had a significant impact on our world view. Early cultures identified celestial objects with the gods and took their movements across the sky as prophecy of what would happen in future, now we call this astrology. Often, when we are immersed in our own culture, it is difficult to understand how those from other ethnicities perceive the same Universe differently. In addition, some aspects of our culture are so ingrained in our minds and so commonplace to us that we begin to feel they are universally accepted.

2. ROOTS OF ARMENIAN ASTRONOMY

The perception of the Universe is especially unique in ancient cultures. Ancient astronomy was heavily tied to religious and spiritual outlook of the world, but it contained many accurate observations of phenomena. The influence of astronomy is especially significant in Calendar (Lunar and Solar, Lunisolar), Mythology (the names of the constellations), Religion, Linguistics, Philosophy, Folklore, Arts and Astroheraldry. The influence of astronomy is especially noticeable in ancient nations. The ancient Armenians seemed to consider knowledge and learning to be an important part of their culture – thus studying astronomy was a natural extension of that. Armenia is one of the cradles of ancient science, and astronomical knowledge was developed in ancient Armenia as well. Astronomy in Armenia was popular since ancient times: there are signs of astronomical observations coming from a few thousand years ago. Among the astronomical activities that have left their traces in the territory of Armenia are: the rock art (numerous petroglyphs of astronomical content), ruins of ancient observatories (two of them, Karahunge and Metzamor are especially well known; Karahunge is the Armenian twin of the Stonehenge and is considered even older), the ancient Armenian calendar, astronomical terms and names used in Armenian language since II-I millennia B.C., Anania Shirakatsi's heritage (Anania Shirakatsi 1940), sky maps from Middle Ages. It is believed that the division of the sky into constellations was made a few thousand years ago in the Armenian Highland. According to the American astronomer and historian of science Olcott (1911; 1914), the signs of Zodiac contain such animals that lived many thousand years ago in the territory of Armenia and around. It is very probable that ancient people named the constellations after animals living in their countries rather than known from elsewhere. Moreover, many constellations have their own Armenian names which were different from the Greek ones; however, many of them correspond to each other by the meaning. Studies of the Armenian rock art present in the territory of modern Armenia (historic Armenia was ten times larger, having 300,000 square km area) show that the Armenians were interested in heavenly bodies and phenomena. The Earth, the Sun, the Moon, planets, comets, Milky Way, stars, constellations are reflected in these pictures drawn on rocks in mountains around Lake Sevan and elsewhere in Armenia.

2. 1. ARMENIAN CALENDAR

According to investigations by H.S. Badalian (1970), B.E. Tumanian (1985), and G.H. Broutian (1997), the Armenian calendar was one of the most ancient in the world, may be even the most ancient one. Armenians used Lunar, then Lunar-Solar calendar, and since mid the 1st millennium B.C. they changed to Solar calendar, which contained 365 days (12 months by 30 days and an additional month of 5 days). The new year began in Navasard (corresponding to August 11), when the grape harvest was underway and the constellation Orion (Armenian “Haik”) became visible in the night sky. Together with the months, all days of any month also had proper names. The year 2492 B.C. was adopted as the beginning. The Armenian Great Calendar was introduced in VI century, and the difference with the Julian one was re-calculated. It is remarkable that the Mkhitarians from Venice are the oldest publishers of the Armenian and world calendars (since 1775).



Figure 1: Left: The scene of Ar, Sun God worship on Rock Art, Rights: Rock-carved astronomical symbols in Geghama Mountains.

2. 2. ANCIENT OBSERVATORIES

The most fascinating historical astronomical building is Karahunge (the “Armenian Stonehenge”, the name derives from kar “stone” and may mean “singing stones”; and the other famous name is Zorats Kar). It is a megalithic assemblage, 200 km from Yerevan, and 3 km from town Sisian; at an altitude of 1,770 m. The northern latitude is $39^{\circ}34'$, and eastern longitude is $46^{\circ}01'$. It is an assemblage of many stones put in a circle and a few arms starting from it. As many other such buildings, Karahunge was thought to be a religious assemblage. However, only in the middle of 1980th, Karahunge was first interpreted as an archaeoastronomical monument and was studied by Prof. E.S. Parsamian (1999) and Prof. P.M. Herouni (1998). Estimations give from 7700 to 4000 years for the age of Karahunge. There are 222 stones with a total extent exceeding 250 metres, including 84 with holes (with 4-5 cm diameters). Dozens of astronomical stone instruments with accuracy of 30” may be found. 40 stones form the central ellipse with 45×36 m sizes, having a ruined stone-cluster in the centre. There is an 8m wide 8-stone road to N-E. Some stones were used to find the directions to definite stars. By some estimations (observations of definite stars), the observatory was used during 7700-2200 B.C., for about 5500 years. According to many authors (ex. Bochkarev & Bochkarev 2005), a comparison of the present state of the monument with its situation a hundred years ago reveals a considerable degradation. Thus, the monument needs an urgent protection. The monument is unique of its kind at least in the Trans-Caucasian region and could be even the oldest known observatory in the world. If the estimated age of Karahunge is confirmed by archaeological methods, it clearly should be included in the UNESCO World Heritage list of the most important cultural memorials of our planet. Metzamor is the other ancient observatory in Armenia. Metzamor was an ancient town near river Metzamor, 35 km from Yerevan, in Armavir province. There was a settlement since V millennium B.C. It was first interpreted as an archaeoastronomical monument in the middle of

the 1960s by Prof. E.S. Parsamian (1985). There is an observatory out of the fortress. The most probably estimation of the age is 4600 years. As Karahunge, Metzamor also needs a better study and proper attitude both from the Armenian government and world archaeoastronomical community. There are a few other sites in Armenia that are associated with astronomical activity of our ancient habitants.

2. 3. HISTORICAL RECORDS OF ASTRONOMICAL EVENTS

One of the records of astronomical events by ancient Armenians is Halley's Comet depiction. Coins of Armenian king Tigranes II the Great (95-55 BC), silver and copper-bronze tetradrachms and drachms, clearly reveal a star with a tail on the royal tiara which may be associated with Halley's comet passage of 87 BC. If so, one has another case when astronomical events can be useful for historical chronological problems; this would be a far earlier record of Halley in Armenia than was previously known from chronicles and also one of the earliest known images of Halley's Comet.

It is also interesting that Armenians watched in May 1054 the Crab Supernova even earlier than Chinese in August.

2. 4. SUN AND SUN WORSHIP IN ANCIENT ARMENIA

Throughout the history the Sun symbol has been found nearly in all cultures, it has played an important role in shaping our life on Earth since the dawn of time. Since the beginning of human existence, civilisations have established religious beliefs that involved Sun's significance to some extent. Considered by most nations as a cosmic power, it's not surprising we see the Sun emblazed upon countless artifacts and writings. As new civilizations and religions developed, many spiritual beliefs were based on those from the past so that there has been an evolution of the Sun's significance throughout cultural development. Sun was personified as a cosmic eye viewing out upon its dominion during the day. For comparing and finding the origin of the term Sun we studied it in 66 languages and compared the roots of the words. For finding out from where these roots came from, we also studied 21 Sun Gods and Goddesses and proved the direct crossing of language and mythology.

While studying the terms the Chinese word "Ri" brought to our attention, which takes the same Egyptian hieroglyphic shape of a circle and a dot inside, means "sun" in Chinese too. In the Filipino language, we can find that the word (Aarau) means "the sun" too. Also, the English word (Ray), which means "a beam of light", is derived from the Latin (Rayon), very close to the meaning of "Sun". We can decide that the word "ray" is derived from "Ra" and then, all the Latin prefixes such as radio, radiation, etcetera, are derived from Latin Rayon and Rayon derived from Egyptian Ra. But what is the origin of the word Ra? According L. King and V. Fildnersi (Teryan 1995) worship of the god Ra had been arrived from Assyria (current Syria), which at that period was the neighbor of Armenia. The first and main god in Armenia was "Ar" (Mnatsakanyan 1948; Teryan 1995), which means sun or light. We conclude that the Armenian name "Ar" has given origin to many other names in various languages, including the Egyptian "Ra", which is known since the Pharaoh Amenhotep IV or Akhenaten (Mackenzie 1907) who married Nefertiti from the land Khuri-Mitani covering the territory of Armenian highlands.

As the source of life, the sun became equated with power and the supreme god. Beliefs of the ancient Armenians were associated with the worship of many cults,

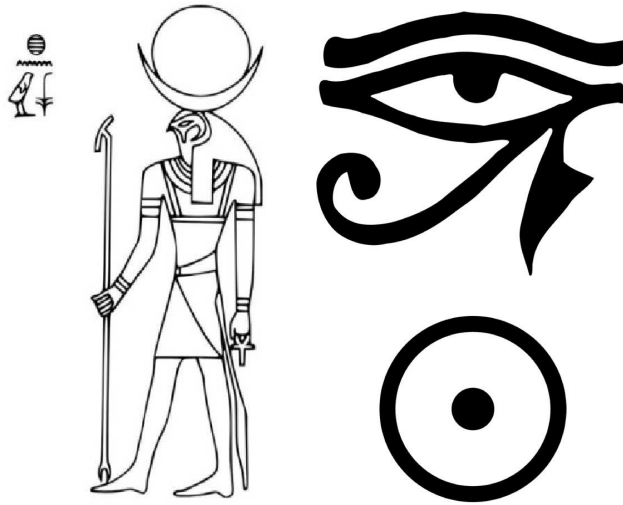


Figure 2: Left: Ra, Sun God, has the head of a falcon and the sun-disk resting on his head, Right: The alchemical glyph in the form of eye is used to represent the Sun since the ancient times.

mainly the cult of ancestors, the worship of heavenly bodies (the cult of the Sun, the Moon cult, the cult of Heaven) and the worship of certain creatures (lions, eagles, bulls). The main cult, however, was the worship of gods of the Armenian pantheon. The supreme god was the common Indo-European god Ar (as the starting point) followed by Vanatur. In southeastern Yemen, the word “Ra” is used to mean the verb “to see”. Similar to Yemen dialect Sha’ means see (note that the word for “ray” in Arabic is “Shu’a”, derived from the Arabic verb *asha’* = to shine). The verb Ra’ in the sense of “to see” has a symbolic relationship to “the sun” and “the rays” one cannot see anything without the presence of sunlight, or more accurately, the presence of a beam of light, ray.

Sun worship is also present in Armenian calendars. The eighth month of the Armenian year and, what is more significant, the first day of every month, were consecrated to the sun and bore its name (Areg), while the twenty-fourth day in the Armenian month was consecrated to the moon (in Armenian calendar, all 30 days have proper names like the names of the months). The Armenians, like the Persians and most of the sun-worshipping peoples of the East, prayed toward the rising sun, a tradition which the early Armenian Apostolic Church adopted, so that to this day the Armenian churches are built and the Armenian dead are buried toward the east, the west being the dwelling of evil spirits.

Early symbols for gods are closely connected with astral symbols. The first use of the sacred swastika and cross are found in ca. 20,000-15,000 BC inscriptions in the Geghama Mountain Range. Carvings dating back to ca. 8500 BCE show symbols associated with astronomy, giving them a god like prominence: Sun, Moon, and constellations were thought to be deities in themselves, and astral occurrences such as an eclipse or a comet were considered communication from the gods.

3. SUMMARY AND CONCLUSIONS

It is shown that the perception of celestial objects varies from culture to culture and astronomy had a significant impact on humankind, particularly on cultural diversities. Armenians as one of the most ancient nations, have very old roots of astronomical knowledge, including the rock art, ancient observatories, astronomical terms and names used in Armenian language since II-I millennia B.C., Armenian mythology related to skies, three Armenian calendars, historical records of astronomical events, the great scientist Anania Shirakatsi's heritage, medieval sky charts, etc. Ancient Armenian calendar and ancient observatories Metsamor and Zorats Karer (also known as Karahunge) are described. The main emphasis is given to the worship of the Sun by ancient Armenians. We conclude that the Armenian name "Ar" has given origin to many other names in various languages, including the Egyptian "Ra", which is known since the Pharaoh Amenhotep IV or Akhenaten who married Nefertiti from the land Khuri-Mitani covering the territory of Armenian highlands.

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