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FORMATION AND DEVELOPMENT OF CHRONOLOGICAL KNOWLEDGE IN CENTRAL ASIA

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ABSTRACT

Humanity has understood the great importance of "material" measurements and measurement units since the early stages of development. In Central Asia, too, serious attention has been paid to the issues of maintaining measurements and their stability, and strict adherence to measurement rules. In most cases, it was controlled by the highest officials. For example, in the teaching of Islam, the issues of correct measurement, that is, not to hit the buyer's price, were considered very seriously. In this regard, expressions such as "the buyer's right is worth seven cents" instilled in the spirituality of our people are proof of this doctrine.

KEYWORDS: *Chronological Tools, Calendar, Metric System, Astronomical Chronology.*

INTRODUCTION

Historical records show that in ancient times wars between states were sometimes caused by differences in measurements. Over time, during the development of trade and mutual economic relations, the methods of clarifying the measurements, creating new ones, comparing and comparing them were formed, and dozens of new and more perfect measurement units began to be formed. . The issues of the interdependence of these units have become more and more important. Therefore, scientists adopted the metric system on May 20, 1875, in Paris at a conference of representatives of 20 countries and received the name of the Metric Convention. The Metric Convention is the first international agreement on scientific activity in metrology. The Convention also establishes the International Bureau of Weights and Measures as a scientific institution for the maintenance and verification of metric standards.

The metric system of measurements in Central Asia was approved on April 18, 1923, by the decision of the SNK of the Republic of Turkestan "Regulations on Weights and Scales" and in the presence of the Committee on the Promotion of Internal Trade started after the establishment of the Turkestan Bureau of Weights and Measures.[1]

Man has always tried to determine his place in the world, to know the secrets of nature and to use them as much as possible. One of the issues that has interested man since ancient times was the issue of time and its size.

The need to measure time arose in the most ancient times. Primitive people encountered various natural phenomena in their work. The continuous change of day and night, the seasons, the visible path of the Sun in the dome of the sky, the consistent and repeated change of the phases of the Moon, the daily change of the position of some stars, and other similar natural phenomena,

people gradually learned about the laws of nature. -slowly begins to gather concepts. Primitive people, as a result of countless observations, came to the only correct conclusion about the need to connect the calculation of time with nature, its events and laws.

Even in the period of the primitive community system, people understood the flow of time by observing the alternation of day and night, the freezing and thawing periods of water, the times of rain and overflowing of rivers, the greening of grass and the ripening of fruits. who have learned to define and measure it. Based on the necessity of everyday life, people kept accounts to determine the season of hunting, crops, and harvesting. In this way, early, simple calendars appeared at the dawn of human culture.

Research Methodology

The first natural unit of time was the day in connection with the alternation of human labor and rest. Initially, the calculation of days and nights were limited to the first five digits - the number of five fingers on one hand. This is how the five-day week, which was later named "small week", was created. Later, a "big week" - a ten-day week - appeared according to the number of fingers on both hands. Not only the calculation of days but the calculation, in general, may have started from the fingers of a primitive person. This has been proved by the observations made in order to study the life of some people living at the lower stages of social development.

Later primitive people paid attention to the fact that the Moon regularly changes its appearance. In this way, a unit of time larger than a day and a week - the lunar month - appeared.[2]

Another unit of time is the seven-day week, which was known in ancient times and which can be seen with the naked eye by the five planets (Mercury, Venus, Mars, Jupiter, and Saturn) and the luminaries of the sky - the Sun and the Moon. According to the number, it first arose in the East, in Babylon. Saturday is the day of Saturn, Sunday is the day of the Sun, Monday is the day of the Moon, Tuesday is the day of Mars, Wednesday is the day of Mercury, Thursday is the day of Jupiter, and Friday is Venus. (Venus) day calculated. The emergence of the week was also connected with the change of appearance of the Moon.

Before the appearance of the current calendar, people used to carve the days and months on wood and other objects, tie knots on hemp, rope, etc., and convey messages to generations through superstitious signs, narratives, and stories. An example of this is the Darius calendar, which was told by the famous ancient Greek historian Herodotus. People of Siberia, Guinea, Polynesia, and East Africa also used the knotted calendar.

At first, this measurement was rather rough, somewhat far from the truth, and later, over the centuries, it became closer and closer to the truth. As a person rises to higher levels of cultural development, his knowledge about the world surrounding him and about time has deepened and expanded.

So, in the early stages of social development, people had ideas about time depending on certain natural phenomena. The demands of everyday social life make it necessary to invent units of measurement of time and calculate them. However, the creation of a special time account and its wide application in life is related to the social division of labor. The lunar (lunar) calendar appeared in pastoralist peoples living a nomadic life, and solar calendars in sedentary peoples engaged in agriculture.

Among many other life-philosophical issues, the problem of time has occupied the human mind for thousands of years. How many philosophical views, astronomical conclusions, physical

assumptions, mathematical calculations, geographical measurements have not been created by mankind during its entire life. It's natural, of course. Because man has always tried to determine his place in the world, to know the secrets of nature and to use them as much as possible. The dimension of time has been important in all stages of human development. The science we are starting to study is dedicated to this important issue.

Chronology is derived from the Greek words chronos- "time" and logos- "science" and means the science of measuring time. Chronology appeared with the development of the science of history in the late 16th and early 17th centuries. It is divided into two parts:

1. Astronomical (mathematical) chronology.

2. Historical (technical) chronology.

Mathematical chronology studies exact astronomical time through scientific observation and calculation of the movement of celestial bodies.

Astronomical chronology determines the exact astronomical time by studying the laws of the movement of celestial bodies. Historical chronology deals with determining and clarifying the dates of specific historical events and documents. The subject of historical chronology as a science is to study how different peoples measured time in different periods, as well as the historical emergence and development of different systems of time calculation, to convert the dates of historical events and different calendar systems to current time. These two parts of chronology are related to each other, in the study of historical chronology, astronomical chronology is necessarily referred to.

The history of calendars is an integral part of human civilization. As knowledge about the outside world increased and in different periods, calendars were improved in connection with the needs of the national economy. Observation of nature, complex mathematical calculations in determining time laid the foundation for the emergence of the science of chronology in ancient times. The development of chronology first took place in the countries of the ancient East, such as Egypt, Babylon, India, Greece and Rome.

Among the first scientists who scientifically dealt with chronology, we can include the ancient Greek scientists Erotosthenes and Ptolemy, Callippus, the ancient Roman thinkers Varro, Stensorinus and Macrobius. For example, the Greek mathematician Claudius Ptolemy (2nd century BC) is the author of the famous "Almagesta" work on astronomy. The work itself gave a description of the entire astronomical knowledge of that time. Astronomical observations were recorded in ancient times according to the years that kings ruled, so Ptolemy compiled the "Chronological Law of Kings".

The next perspective of chronology took place in the Middle Ages. The development of chronology as a science in Europe is associated with the name of the French humanist-scientist Joseph Scaliger. He had a great impact on further scientific research in this field with his "Improvement of Time Reckoning" (1583), "Treasure of Time" (1606), and other works. J. Scaliger brought a certain order to the historical chronology and developed precise methods of translation (reduction). Among the scientists who contributed to the development of the science of chronology are the German astronomer and chronologist H.L. Ideler ("Handbook on Mathematical and Technical Chronology"), another German scientists F. Gintsel, H. Grotefend, F. Ruhl, French scientist A. The names of Jiri and the Hungarian historian I. Szentpeteri, the Austrian scientist R. Schramm and others can be mentioned.

Abu Rayhan Beruni made a great contribution to the development of the science of historical chronology. Abu Rayhan Muhammad ibn Ahmad al-Biruni was a great encyclopedist scholar who mastered all the sciences of his time. One of Abu Rayhan Beruni's valuable works on chronology is the book "Relics from Ancient Nations". The Arabic name of the work is "Al osor al-baqiya an al-qurun al-kholiya", it is known as "Chronology" in Europe, and "Osor al-baqiya" in Uzbek oriental studies. Beruni completed this work at the age of 27, in 1000. The work was written in Arabic, and the person who introduced this book to Europe for the first time was the famous German scientist Eduard Zachau (1845-1930).

In this work, also called "Monuments", Beruni describes the peoples known to him - Greeks, Romanians, Iranians, Indians, Sogdians, Khorezmians, Christians, Hulanites (star worshipers), Copts, Jews and described the social and cultural life and history of other nations before Islam. Also, the annual accounts of these peoples, various holidays and famous days are described in detail.

Many issues of astronomy and mathematics are explained in the work. Beruni is the first among Muslim scholars to provide information about the Jewish calendar. The issues covered by "Osor al-Baqiya" are not limited to these.

Another historical work of the scientist "Kitab tahqiq moli-l-Hind min maqula fi aql wa-l-marzula" ("Determining the reasonable and unreasonable doctrines of the Indians") is more popularly known as "India". It contains the geographical situation of India, the socio-political system, laws, religion, customs, literature, exact sciences, philosophy, history and narratives of the Indians, the weight and size of the people in India at that time. 'dimensions are mentioned.

Mirzo Ulugbek's work "Zizhi Jadidi Koragoniy" also describes the correlation between more than ten calendars used in the Middle East, China, and Europe at that time.

Analysis and Results

Different calendars were used in Central Asia in different periods. The Zoroastrian calendar is one of the oldest calendars used by the peoples of Iran and Central Asia. This calendar was created together with the Zoroastrian doctrine, and it is also called the Avesta calendar, because the Zoroastrian calendar, the names of the months and all other terms are taken from the book "Avesta". Since it is the oldest calendar used in Iran, the name of the ancient Iranian calendar is also used in current scientific literature. The Zoroastrian calendar is based on the solar year and consists of 12 months. Each month consists of 30 days, and an additional 5 days are considered a separate month. The names of the 12 months in the calendar go back to the names of the goddesses in "Avesta". In addition to the names of the months, the days included in the month (30 days) also have separate names. The text of "Avesta" compiled during the Sasanian period in the 6th century AD contains a complete list of names of months and days.

Zoroastrian month names: 1. Farvardinmoh, 2. O’rdubehishtmoh, 3. Xurdodmoh, 4. Tirmoh, 5. Murdodmoh, 6. Shahrivarmoh, 7. Mehrmoh, 8. Obonmoh, 9. Ozarmoh, 10. Daymoh, 11. Bahmanmoh, 12. Isfandarmazmoh.

Each month has a special name for 30 days, which are as follows: 1. Xurmuz, 2. Bahman, 3. O’rdubehisht. 4. Shahrivar, 5. Isfandarmaz, 6. Xurdod, 7. Murdod, 8. Dayba ozar, 9. Ozar, 10. Obon, 11. Xur, 12. Moh, 13. Tir, 14. Jo’sh, 15. Dayba mehr, 16. Mehr, 17. Sarush, 18. Rashn, 19. Farvardin, 20, Bahrom, 21.Rom, 22. Bod, 23. Daybadin, 24. Din, 25. Ard, 26. Ashtoz, 27.

Asmon, 28. Zomyoz, 29. Morasfand, 30. Aniron. These names given to thirty days apply to all days of the twelve months of the year.

The Khorezm calendar, the land where "Avesta" was created, also has a long history. Unfortunately, information about this calendar has not been preserved in historical sources other than Abu Rayhan Beruni's book "Relics from Ancient Nations".

The known ancient calendar system of Khorezm existed 980 years before Alexander the Great. At first, the Khorezm calendar did not use a week. The days of the week that appeared later were considered to have a certain meaning. In addition to the names of the week, the days had other names. For example, the people of Khorezm named each day of the month. The naming of the days in a month was the same in the Khorezm people and the Sogdians.

Khorezm people used lunar addresses. They made judgments about astronomy from them. They divided the addresses of the moon into 12 constellations and named the constellations separately in their own languages. Beruni notes: "The people of Khorezm knew the constellations better than the Arabs." The Khorezm people and the Sogdians followed the same practice of adding extra days to mark the beginning of the year. They say that 115 years of the solar year are 365 days, and 1 month and 1 day are added to the 116th year.[5]

The Khorezm people used twelve months, each of which consisted of thirty days. In the work of Abu Rayhan Beruni, the names of the months are given in two different forms: full and shortened. The full name of the months is very long, and most of the sounds are consonants. Beruni gives the abbreviated form of Khorezmian month names as follows: 1. Novsorjiy. 2. Ardvst. 3. Xrvdod. 4. Jiriy. 5. Xmdod. 6.Axshrivriy. 7. Avmriy. 8. Enoxi (Yonoxi). 9. Arv. 10. Rimjd. 11. Ashmnr (Arshmi). 12. Isfandorajiy. The short form of months is used in daily work and administrative documents. In ancient Khorezm documents of the IV-VIII centuries and Arabic-Khorezm sources of the XII-XIV centuries, the names of the months are used in the above forms.

As in the ancient Iranian (Avesta) and Sogdian calendars, the Khorezm calendar has a separate name for each day of the month. Beruni also gives 30 different names for 30 days:

1	Rimjd	11	Axir	21	Rom
2	Azmin	12	Mox	22	Voz
3	Ardusht	13	Jizi	23	Dzu
4	Axshrivriy	14	Gvsht	24	Diniy
5	Isfandormajiy	15	Dzv	25	Arjvxiy
6	Xrvdoz	16	Fig	26	Ashtoz
7	Xmdoz	17	Asrvf	27	Asmon
8	Dzv	18	Rshn	28	Ros
9	Arv	19	Rvjn	29	Mrsbnd
10	Yonoxn	20	Arign	30	Avnrg

The people of Khorezm did not give special names to the five days added to the last month.

The Sogdian calendar is also based on the solar calendar. It was very close to the ancient Iranian (Avesta) and Khorezm calendars. The fact that a year consists of 12 months, each month has 30 days, and each day has its own name is confirmed by both Sogdian documents and the information provided by Beruni. According to the Zoroastrian tradition, the last five days, which

are added at the end of the year, are marked as "pre-Navruz holiday days". It is observed that the time and names of these days are exactly the same in Sogd and Khorezm. For example, the first day of the month is a day dedicated to Ahuramazda, and it is called "khurmuzruch" in Sogdian documents, according to Beruni it is called "khurmijd" in Sogdian, and "rimijd" in Khorezm.

It was taken into account that the quarter day, which accumulates as a remainder every year, becomes one full day in four years. The new year begins with the vernal equinox. The order and names of the Sogdian months are as follows: 1.Navsard. 2.Jarjin. Z.Naysanj. 4.Basokanj. 5.Ashnxanda. 6.Majnda. 7.Farkon. 8.Obonj. 9.Fug'. 10.Masfug'. 11.Jamdanj. 12. Xashvim. There are some differences in naming and pronouncing the names of the months. Because in the manuscript sources (also in the works of Abu Rayhan Beruni) the names of the Sogdian months are written only with consonants.

One of the inventions created by human intelligence and which has been serving him in all times is the calculus. It is a product of thinking based on continuous observation of natural phenomena and deep study of its laws.[7]

Scholars have expressed different hypotheses regarding the origin of Muchal's calculation. Turkic peoples and Chinese are the main contenders for this calendar. According to many scientists, the cyclic calendar of the Chinese that we met above is based on the multi-year calculation, which is widespread in East and Central Asia.

Arithmetic was first mastered by the Turkic, Chinese and Mongolian peoples. During the rule of the Seljuk Turks (XI-XII centuries) and especially during the reign of the Mongols (XIII-XIV centuries), muchal counting was also spread in Iran and Afghanistan.

The validity of muchal is interpreted differently in different sources. In the first volume of his famous work "Devonu lug'otit turk", Mahmud Kashgari briefly talks about the calendar of the Turkic peoples. The scientist writes that the Turkic peoples have been using muchal calculus since ancient times. He enumerates the names of twelve animals included in the Muchal, starting from the mouse to the pig, and cites the Turkish legend of the Year of the *Muchal.*

Beruni says in his work "The Law of Mas'udi": "The people of the East - the Chinese and the Turks - make up their years in the form of twelve periods and call them by the names of animals and place them in a certain order. But I could not determine whether this period is inflationary or caused by some quantities determined by the movements of the Sun and the Moon. Although Beruni could not determine the real reason for the calculation, his guess is very close to the truth. The point is that -12 years is taken for one complete rotation of Jupiter (Jupiter) around the Sun for this 12-year animal cycle.

Old Turkish, Persian and Uzbek names of Muchal years

№	Turkish	Persian	English	Years
1	*Keshku*	*Mush*	Mouse	1900 12 24 36 48 60 72 84 96 2008
2	*Ut*	*Gov*	Ox	1901 13 25 37 49 61 73 85 97 09
3	*Bars*	*Palang*	Tiger	1902 14 26 38 50 62 74 86 98 10
4	*Tavushkan*	*Xargo'sh*	Rabbit	1903 15 27 39 51 63 75 87 99 11
5	*Lu*	*Naxang*	Dragon	1904 16 28 40 52 64 76 88 2000 12
6	*Yilan*	*Mor*	Snake	1905 17 29 41 53 65 77 89 01 13
7	*Yuned*	*Asp*	Horse	1906 18 30 42 54 66 78 90 02 14
8	*Qo'y*	*Go'sfand*	Sheep	1907 19 31 43 55 67 79 91 03 15

9	*Sichen*	*Xamduna*	Monkey	1908 20 32 44 56 68 80 92 04 16
10	*Dakuk*	*Murg*	Chicken	1909 21 33 45 57 69 81 93 05 17
11	*It*	*Sag*	Dog	1910 22 34 46 58 70 82 94 06 18
12	*To'ng'iz*	*Xo'k*	Pig	1911 23 35 47 59 71 83 95 07 19

According to Ulugbek, the Turks used only this simple 12 animal period and divided the day and night into 12 equal parts named after these 12 animals. He also notes that the Turks and the Chinese started the night at midnight.

To calculate the leap year from the AD year, you need to perform the following steps: add 9 to the year of birth (this number is the difference between the first year of the AD and the first year of AD) and divide the sum by 12. The remaining number after the division operation corresponds to which of the 12 animal names in the muchal calculation, according to the order, will be the searched muchal year. For example, the muchachal of those born in 2002 is found as follows: 2002+9=2011:12=167 remainder - 7. The number seven corresponds to the horse year according to the order of the muchachal calculation. So, many people born in 2002 will be a horse. This calculation is for those born after March 22, because it starts on the vernal equinox on March 21 or 22 every year.

After the Arab conquest, Hijri lunar and Hijri lunar calendars were used in Central Asia. In the lands of Central Asia that were part of the Russian Empire, official documents were conducted according to the Julian calendar. However, the Bukhara and Khiva khanates, which became vassals of Russia, continued to use the Hijri calendar. The Gregorian calendar has been used in Uzbekistan since February 14, 1918.

CONCLUSIONS AND SUGGESTIONS

As can be seen from the above material, the chronology of the peoples of Central Asia had a local character. An important feature of the peoples of Central Asia is the lack of a clear concept of area and distance. The measures of folk chronology are created in practice and satisfy its needs, their application solves the problems of directing space, organizing it around itself, measuring labor costs and their results, and organizing equivalent exchange. The role of unformed units of measurement was played by measuring instruments (measures, ropes, poles) and household utensils and tools with certain dimensions, but they could not contribute to the development of metrology.

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