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ETHNOGRAPHIC AND LITERARY REFLECTIONS ON ANCIENT GEORGIAN ASTRONOMICAL HERITAGE

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Abstract: Ethnographic records and Georgian literature contain useful information about ancient Georgian astronomical knowledge systems and beliefs, with specific reference to time-keeping, the months of the year, the planets, individual stars and specific asterisms, star clusters, the Milky Way, and various kinds of ancient astronomical instruments. In this paper we examine a selection of such material.

Keywords: Georgian astronomy, ethnoastronomy, Georgian literature.

1 INTRODUCTION

Lately, significant attention has been directed to the study of ancient Georgian astronomy (see Chagunava, 1990; Georgobiani, 1986; Kharadze and Cochlashvili, 1958; Simonia et al., 1994, 2000, 2001, 2003, 2004, 2005). General trends in the development of ancient Georgian astronomy have been outlined; problems connected with the functioning of old scientific centers—and particularly observatories—have been discussed; biographical sketches of a number of important Georgian astronomers and philosophers have been presented; and papers and books discussing calendar systems, old manuscripts and books, and artifacts having archaeoastronomical significance have been published. However, much remains to be done, particularly in relation to

1) ethnographical accounts containing information about the sky and celestial phenomena;
2) stone constructions, ruins, monuments, cult places, temples and churches dating from the Bronze Age to the Middle Ages, and their archaeoastronomical and ethno-cosmological significance; and
3) the complex of ancient Georgian astronomical and astrological manuscripts stored at various institutions, archives and museums both in Georgia and elsewhere.

In this paper we contribute to the first of these priority areas by reviewing the astronomical evidence preserved in a variety of ethnographic sources before briefly examining astronomical references contained in some Georgian literature.

2 ETHNOGRAPHIC RECORDS AS SOURCES OF GEORGIAN ASTRONOMICAL INFORMATION

For the purposes of this study, we subjected the following groups of records to comprehensive analyses: (1) ethnographical notes and investigations carried out by Georgian ethnographers and historians during the twentieth century; and (2) various books and dictionaries published at different times in Georgia. Of course, this material is not uniform, but it contains a variety of interesting facts that reflect the knowledge of ancient Georgians about the sky, celestial bodies and impressive astronomical phenomena. Much of this knowledge had practical applications in everyday life, either during agricultural practices, or in direction-finding while voyaging. While some astronomical knowledge was modified or lost with the passage of time, basic concepts about the Universe survived through to the present day. We believe that the motivating mechanisms that led to accumulation of this celestial knowledge were: (1) the need for orientation and to fix time in order to maintain a continuous agricultural cycle; (2) the need for local and global spatial orientation, in order to bring the land into cultivation (i.e. to be able to build roads, construct settlements, etc.), as well as for military purposes; and (3) the need to 'interact' with bright heavenly bodies for cultic, religious purposes. These were the main factors that served to stimulate the accumulation and adaptation of knowledge about heavenly phenomena, knowledge that was used by ancient people in everyday life. Among ancient Georgians, this eventually led to the formation of a rather harmonious ethno-cosmological system of beliefs. However, our knowledge of this system is far from complete, for we only have snippets of information drawn from scattered ethnographical sources. Let us now examine some of this fragmentary evidence.

2.1 Orbeliani's Dictionary of the Georgian Language

In the seventeenth and eighteenth centuries the Georgian philosopher Sulkhan Saba Orbeliani (1658–1725) composed an explanatory dictionary of the Georgian language (*Sitkvis kona* = Bunch of Words), which included various astronomical words and terms. This dictionary was based of early Georgian and foreign

manuscripts, and the meanings of some of the astronomical terms were discussed by Simonia and Simonia (1994), who took into account the sources used when compiling the dictionary and the philosophical ideas of its author.

The final edition of Orbeliani's dictionary, published under the editorship of Abuladze in 1993, contains some terms relating to the calendar. For example, on pages 650-651 in the second volume the names of the months are given, not just in Georgian but also in Latin, Arabic, Turkish, Greek and Assyrian. Moreover, it is interesting that the author gives two different types of Georgian names for the months: the ancient Georgian literary names and the folk names. First, we shall list the folk names: gantskhadebis tve, phebervali, marti, aprili, maisi, ivanobis tve, kvirikobis tve, mariamobis tve, enkenis tve, gvinobis tve, giorgobis tve and kristeshobis tve (in that order). In English, these respectively mean: the month of Appearance, February, March, April, May, the month of Ivanoba, the month of Kvirikoba, the month of St. Mary, the month of Enkeni, the month of vine-making, the month of St. George and the month of Christmas. From the names it is obvious that the months were connected with important agricultural periods (e.g. the month of vine-making), as well as with the names of Christian Saints and with the birth of Christ. The dictionary demonstrates that these folk names for the months were used from the fourth century AD through to the eighteenth century.

For comparison we now give the ancient Georgian literary names for the months: apani, surtskunisi, mirkani, igrika, vardobis, marialis, tibis, kveltobisa, akhaltslisa, stvlisa, tirisknis and tirisdeni. The meanings of some of these names are clear, but others have still to be interpreted. For example, tibis tve (the seventh month), means the time of haymaking; akhaltslis tve (the ninth month), is the first month of a new year; and stvlis tve (the tenth month), means the month of counting—when they would count the harvest, and in particular the grape harvest.

It is clear that Orbeliani's dictionary contains valuable information about the astronomical and calendrical knowledge of the Georgian people, and that it warrants further study.

2.2 Javakhishvili's *Materials about the History of Georgian Local Manufactures and Small Handicrafts*

In 1983 a five-volume study titled *Materials about the History of Georgian Local Manufactures and Small Handcrafts* was published, based on ethnographic information gathered by I. Javakhishvili in villages throughout Georgia.[1] We found an interesting extract in the second part of the fourth volume, on page 154:

> When the time comes to let oxen off the plough, they (the drovers and ploughmen) eat. The day drover and ploughman go to sleep, while the night drovers send the cattle to pasture. When an ox is tired, it does not eat, but lies down to rest. A good drover does not allow it to lie and makes it eat. Otherwise, the following day a hungry ox cannot work. When the ox is sated, it lies down. A good drover does not lie down until the ox lies down. Then the drover lies down and puts his head on the ox. When the ox gets up, the drover wakes up. At dawn the ox usually runs away. It is tired of work. The drover needs to be very watchful and not allow the ox to run away. The ox goes far away to a pasture and the drover should know the time when to bring it back in order to yoke the ox in time. Night drovers compete with each other, and ploughmen compete in yoking the oxen. Drovers judged the dawn by the stars. When Mravalai was leveled, the drover sent the cattle to pasture. Little by little Mravalai declined and it was assumed that after Mravalai rose Sastsvrebi, and at the very end – Chkita or Tsiskari. Prior to Tsiskari, Khariparia rose. The drover looked up, saw Khariparia and used to say: "I can sleep a little more." He went to sleep and the ox ran away and was lost (an ox usually runs away at dawn). That is why this star is called "Khariparia". (Our translation).

First of all, it should be noted that "Khariparia" in English means "a runaway ox"; "Mravalai" means multiplicity; "Sastsvrebi" is Libra; "Chkita" is to peep out; and "Tsiskari" can mean "the door of the heaven" although it was also the name of the planet Venus. Ethnographers believe that the story of Khariparia has been part of Georgian folklore from time immemorial since farming has a long history in Georgia (see Assatiani et al., 1997; Braund, 1994).

We chose several stars as possible candidates for the 'role' of Khariparia on the basis of the following criteria, and estimated the changes in their coordinates over the last two thousand years as a result of precession.

1) The star had an apparent visual magnitude ≥ 1.5, in that it had to be bright enough to be conspicuous to an inexperienced observer.
2) Since it was visible following the spring period of sowing, we only chose stars with right ascensions between 18h and 05h 30m.
3) Given variations in Georgia's latitude, only stars with declinations north of $-20°$ were considered.

We used the Simbad Astronomical Database for this analysis, and the results are presented in Table 1. This shows that the only viable candidates are α Lyr (Vega), α Aql (Altair) and α Cyg (Deneb). All of these bright stars could attract the attention of ancient drovers and ploughmen.

Table 1: Khariparia candidates.

Name	Magnitude	α 2000 (Simbad)	δ 2000 (Simbad)
α Lyr (Vega)	0.03	18 36 96.3	+38 47 01
α Aql (Altair)	0.76	19 50 46.9	+08 52 05
α Cyg (Deneb)	1.25	20 41 25.9	+45 16 49
α Tau (Aldebaran)	0.86	04 35 55.23	+16 30 33
β Ori (Rigel)	0.3	05 14 32.27	–08 12 05
α Aur (Capella)	0.03	05 16 41.35	+45 59 52

We then decided to extend the search to other objects and examined binary stars, wide pairs of double stars and selected variable stars, and so on, but none of these objects proved to be a suitable candidate on the basis of the aforementioned criteria.

2.3 Bochoridze's *Tusheti Ethnographic-folklore Material*

In his book on Tusheti ethnography and folklore, G. Bochoridze (1993; our translation) writes:

> Below I give brief information collected by me in the village of Omalo on celestial bodies. They are the stars: Khariparia, Tsiskari, Gutneuli, Jaraebi – a row of stars, Mravalai, Tsultokhebi – resembling a sickle. In spring they follow Mravalai at the distance of one sabeli (the unit of measurement in old Georgia), and in winter they are far from each other.
>
> Stars:
>
> 1. Tsultokhebi – rise in summer at supper-time, in the month of "Giorgobistve" they rise at midnight, they are 5 stars.
> 2. Mravalai follows Tsultokhebi as a cluster. Now it is called Jaraebi (Mravalai was its early name).
> 3. Tsiskari follows them, in summer – in the evening, in the month of Giorgobistve - at night, in supper time (in the morning it sets at dawn). It rises before sunrise, it is one star.
> 4. Mejoge, Jogis Tsiskari is one star. It rises after midnight and is a big star.
> 5. Irmebis Nakhtomi (Jump of deer). An ox and a deer competed with each other in serving a peasant, in adroitness and in ability. The ox won and the deer was torn into two parts when it jumped.

The ethnographers who collected this information probably did not have detailed astronomical knowledge or observing experience, and this is why they did not try to identify the different stars. What can we deduce?

It is interesting that in spring Tsiskari, Gutneuli, Jaraebi and Tsultokhebi follow Mravalai at a definite distance and then the distance between them increases. This indicates that some of these stars are 'wandering' stars, i.e. planets. Among them is Tsiskari, which we identify as Venus, and Mejoge—another planet which rises after midnight. However, our identification of Tsiskari and Mejoge as planets creates certain problems in that the positions of the planets change in the sky in the course of the year and from year to year, but this peculiarity is not reflected in the ethnographic record.

Also of interest in the above-mentioned quote is the "Jump of deer." In our opinion, this short legend shows how the ancient Georgian peasants described the faint strip of light that crossed the sky—namely the Milky Way. In modern Georgian, the Milky Way is translated as the 'jump of deer', whereas the *Georgian Encyclopaedia* (Volume 5, page 225) gives the following ancient Georgian synonyms for the Jump of Deer (Irmis nakhtomi): Trace of an Ox, The Way to Jerusalem, The Leg of a Bear and the Trace of a Bear's Knee.

S. Menteshashvili (1943) throws light on some of the other astronomical terms listed above. For instance, Gutneuli (which he terms Khargutani) is the constellation of Ursa Major, while Mravalai relates to Ursa Minor. The *Georgian Encyclopedia* (Volume 8, page 106) shows that the names Mravalai and Khomli (mentioned below in Section 2.4) are ancient Georgian synonyms for the Pleiades star cluster. The fact that the Pleiades lie within the constellation of Taurus is interesting from the viewpoint of the origin of the different names.

2.4 Khomli Stars in Oral Stories and Chronicles

Let us now consider the book by M. Makalatia (1972), in which he describes some ancient traditions associated with pasturing of sheep in different seasons. For example, on page 50 we read:

> The people living in the villages of Khizabavra and Zveli still remember the ancient traditions of determining the time of driving the cattle. After the week of Khomli they could drive the cattle over an upper mountain, as snow was not expected any more. The week Khomli comes in the month of Tibatve, when a group of Khomli stars appear. Khomli rises on the 6th day of Tibatve, but till 12 Tibatve it is not seen by eye. During this week great care is taken with the sheep being in the open air. The peasants ... believe that Khomli is dangerous in the morning, when sheep still lie in sheep-pens. If Khomli rises above the lying sheep, it "strikes them and causes the falling-off of their hair and the ulceration of their heads and faces" (Khizabavra) ... In the morning they wake the sheep and drive them (Zveli). In the village of Zveli, during the Khomli week sheep are driven to the nearby fields at the edge of the forest, where there is a protected place Cholaka. (Our translation).

Georgian peasants knew of the heliacal rises of the stars, but they were afraid of this phenomenon. Such beliefs probably originated in pagan times (i.e. prior to the fourth century AD in Georgia). The above ethnographic fragment contains ancient data from a period when Georgians still used ancient terms—including Tibatve—for the names of the months.

The Georgian chronicle *Kartlis Tskhovreba* (*Description of the Kingdom of Georgia*) by Vakhushti Batonishvili (1973) also refers to Khomli. In Volume 4 on page 762 we find (our translation):

> ... to the west of the Rioni [a river in western Georgia] at the base of the mountain is Khomli rock, which is very high. It deserves such a name on account of its height. It was identified with the star Khomli. In this rock a cave was cut, which was inaccessible to enemies, and this was used to store the Kings' treasures. (Vakhushti Batonishvili (1696–1784), Georgian historian and geographer, and the son of the Georgian King Vakhtang VI Bagrationi).

This Georgian chronicle accommodates a long period in Georgian history, from antiquity to the eighteenth century AD. Meanwhile, the brief above-mentioned quote indicates that a) knowledge of the Khomli star was widespread in Georgia in the past; and b) the exact spot where Khomli was seen to rise was observed by ancient astronomers from the high rock bearing the same name.

2.5 Bedukadze's *Popular System of Time Determination ...*

In a monograph relating to systems of ancient Georgian time-determination, S. Bedukadze (1968; our translation) says:

> In Khevi [a region of Georgia] they have a cult-ceremony, the so called "Astvaglakhoba". On New Year's Eve, three archpriests ascend to the top of

> "Sameba" for the night. They sit in silence leaning against each other's backs and observe the sky until daybreak. In the morning they sacrifice a new-born calf, have a feast, and then predict the weather, the harvest, wars or diseases in the coming year.

In our opinion, this ethnographical account describes the ancient Georgian tradition of carefully-planned methodical observations of the positions of celestial bodies. This tradition was probably perfected over a long period of time. We believe that those living in the mountainous regions of Georgia divided the dome of the sky into three equal triangular sectors for better understanding of the phenomena taking place there. They realized that one observer could not adequately observe the whole sky and understand what he saw. Accordingly, on New Year's Eve three pairs of eyes carefully and simultaneously watched the sky. The division of the sky into two equal parts would have been insufficient and into six parts more than necessary, that this is why three (and not two or six) archpriests ascended to the top of mountain. Information about phenomenon seen by one of them was subsequently added to data obtained by the other two observers, and thus the whole picture was formed. Each of them was responsible for his sector of 120°. The fact that the archpriests predicted the future speaks in favor of the fact that there could be some empirical experience connected with atmospheric climatic phenomena determining the visibility of one or another celestial body. This mosaic triangular Universe impresses one with its thoughtfulness. The ancient priests knew how to observe, calculate time and orient themselves with respect to their environment. Here we speak from our own point of view, but this ethnographical material can be considered from other points of view as well.

2.6 Concluding Comments

The ethnographical examples containing astronomical information presented here in Sections 2.1 through 2.5 form only a small part of ancient Georgian folk heritage. It is to be regretted that the scholars who collected such celestial data lacked the knowledge to adequately investigate ancient Georgian astronomical systems, but this is thoroughly understandable given that the focus of their studies was the everyday life of Georgian peasants.

The landscape of Georgia is diverse and ranges from high mountains to low plains. Large and small villages are scattered throughout the country and the situation would have been the same in the past. Often when there were cold winters or hot summers ancient peasants from one village would have had little opportunity to meet their counterparts from other villages, as such rendezvous often would have involved trips of several hundred kilometers over high mountains and through thick forests. So it is quite possible that the same celestial objects went by totally different names in different regions of the country, or even in neighbouring villages. This interesting possibility clearly requires further investigation.

3 ASTRONOMICAL REFERENCES IN GEORGIAN LITERATURE

Let us now consider another source of ethno-astronomical information about ancient Georgians: classical and modern Georgian literature. Various examples—involving both prose and poetry—are discussed below.

3.1 Rustaveli's *The Knight in the Panther's Skin*

In the poem *The Knight in the Panther's Skin* by the well-known twelfth century Georgian scholar, Shota Rustaveli, one can find plenty of ethno-astronomical material. A full astronomical analysis of this ancient poem needs to be carried out separately, but for the purposes of this study we will only consider a sample of its contents. In 1968, Bedukadze also examined evidence of time-determination as reflected in Rustaveli's poem, and she particularly drew attention to strophae 184, 185, 770 and 1569.

Let us look at strophe 1569 (our translation):

> The star of dawn shines as bright as the moon when together in heaven,
> But if they part and withdraw from each other they fade and grow paler.
> They must alas withdraw from each other if heaven has willed it.
> One must be as high as a hill or a mountain to see them.

Bedukadze assumes that in this poem Rustaveli shows that the old way of determining time was through observations of the motion of specific celestial bodies from the top of a high hill. And the observer had to be able to observe in all four directions.

3.2 Astronomical Instruments Mentioned in Georgian Literature

On the basis of ethnographical documentation, Bedukadze (1968) also proceeded to describe the types of instruments used by the ancient Georgians to determine time:

> In Khevsureti [a region of Georgia] seasons were determined by means of a group of stone columns, the so-called "Sun nests" erected on peaks to the east of villages. According to the motion of the rising Sun from one nest to another, people determined: a month, a season, the end and the beginning of a year, the important dates of agricultural character.
>
> The important element of old houses in Svaneti [Svaneti is a region of Georgia] was a ritual east window (lakhvra), looking towards to the Sun. The head of the family – a man – used to read prayers by the window at each sunrise. Lakhvra was something like a calendar, or fixed tool relating to solar motion. In this calendar, the different places where the first sun-beam fell were marked ... [and] the track of its motion during the days and months. In such a way the holy days of each season were determined, and the dates when agricultural work should start. (Our translation).

Bedukadze (ibid.) also describes various moondials and sundials of the simplest construction (circular or with a straight edge), used in different regions of Georgia (Kartli, Trialeti, Meskheti, Javakheti, etc.): a moon or sun beam reflecting a ray of light or a shadow and how these moved in the course of time around the family hearth in the center of the house. The head of the family (the father or the mother) used such dials in everyday life.

3.3 Concluding Comments

It can be seen from the foregoing material that in the twelfth century AD in Georgia a harmonious system

existed to determine and make use of time. If Rustaveli used folklore in his poem then one can assume that this system of time-determination was developed in Georgia earlier than the twelfth century. Thus, Rustaveli's poem contains historical and ethno-astronomical information.

The system of time-determination by means of 'Sun nests' seems to be a very ancient one. In the high mountains of Khevsureti, processed stones and stone constructions served the ancient Georgians as farming implements, arms and simple instruments for time measuring. We think that stone columns on the tops of mountains were prehistoric Georgian sundials.

The Svan lakhvra was a fixed tool for demonstrating the motion of Sun, and was another type of ancient Georgian sundial. It was only used for domestic purposes. Taking into account the tower-like constructions of Svan houses and the mountainous terrain in Georgia, a small east window (lakhvra) seems to have served as a primitive type of sundial. It is obvious that in different regions of ancient Georgia various systems of time-determination were developed, and the simplest of instruments were made and used for measuring time. We think it would make good sense to organize scientific expeditions to mountainous areas of Georgia, such as Khevsureti, Svaneti, as well as some other regions, in order to search for the remains of ancient sundials. We also believe that a full ethnoastronomical analysis of Rustaveli's poem should be carried out.

4 CONCLUSION

Georgian ethnographic accounts contain an abundance of important astronomical information. Though this in-formation is diverse, it is scattered, and specialists working in the fields of history, ethnoastronomy and anthropology should make regular efforts to gather, optimize and analyze it. However, this is not a simple exercise as it requires great effort and time. In the villages in the mountainous and flat regions of Georgia one can still encounter many recorded legends, oral accounts and folk poems containing ancient Georgian information about the sky, the stars and the Universe and the place of a man in this boundless realm.

In this paper we have considered a number of records that contain information about ancient Georgian astronomical traditions and practices. While many such ethnographic records exist in Georgia, most have yet to be analyzed from an astronomical standpoint. Much research remains to be done, and we invite foreign scholars to join us in this endeavour.

5 NOTES

1. Professor Javakhishvili organized ethnographic expeditions to many Georgian villages between 1915 and 1935. He worked up his ethnographic notes and prepared them for publication, but died in 1940 before this could be arranged. The manuscript was kept in the museum, and was only published in 1983.

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