

# Time and Astronomy in Past Cultures



Warszawa – Toruń 2006

Proceedings of the Conference

# **Time and Astronomy in Past Cultures**

Toruń, March 30 – April 1, 2005

Edited by Arkadiusz Sołtysiak

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# The Observation of Celestial Bodies and Time Counting in the Lithuanian Folk Culture

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**Abstract:** *This paper deals with Lithuanian ethnographic data of the 19<sup>th</sup> and 20<sup>th</sup> centuries and with historical sources disclosing some of the Lithuanian folkways of counting time. This popular chronology is based on the observation of the Sun, the Moon and the stars. The Folk knowledge about the cycles of celestial bodies used to define the time of the day, the days in the year and the seasons is discussed and summarized. The ethnographic material shows that the azimuths of the sunrise and sunset were observed. The length of the shadow of a gnomon which can be a chosen tree or a person, etc., have been used as well as the simple observation of the eight of the Sun above the horizon.*

*We certainly know that the changes of Moon phases and its positions among the stars and constellations were observed for the Moon calendar. But although the connections between various agricultural works and the phases of the Moon are very strong and significant, we unfortunately still miss extent direct knowledge about Moon observations.*

*Certain stars and planets were observed as well in the folk calendar, more especially the Pleiades, Orion, Ursa Major and Venus.*

## I. The Sun

### Determination of the time of the day

The cycle of the movements of the Sun over horizon was the most natural phenomenon used to divide the day. Of course, the solar motion was perceived as a rotation around the earth. According to the cardinal positions, one full day was divided into 4 smaller parts: *rytas* 'morning', *vidurdienis* 'noon, midday', but also the term *pietūs* was commonly used, meaning altogether midday, dinner time, and South; *vakaras* 'evening' and *vidurnaktis* 'midnight'. These divisions corresponded to sunrise, upper solar culmination, sunset and mid night. Accordingly the same solar positions were applied to the space structure (cardinal points) which were named: *rytai* 'east', *pietūs* 'south', *vakarai* 'west', and *šiaurė* 'north' or sometimes *vidurnakčiai* 'midnight, north'.

Thus, the daily movement of the Sun through the sky was used to organize space and time and all human activities: work, meals and rest. We can observe here that the distinct categories of time and space were perceived as a unique

whole, a time-space dimension, forming a frame for all activities. More precise subdivisions also relating to meal times were added to these four main cardinal solar positions:

1. *priešpusrytis (priešpusryčiai), priešrytis* literally meaning 'before half east' or 'before breakfast' or 'before East' or 'before morning', some times *apieaušris* 'twilight'. The time of night when the Sun is about north – east (in summer time) just before dawn, and the time of the first breakfast in summer time.
2. *pusrytis*, 'half east' or 'half morning' or 'breakfast', more or less the time of sunrise at the East, time of first breakfast.
3. *priešpietis* or *pùspietis*, 'before south' or 'half south' – forenoon, time of the second breakfast, the Sun is then approximately in the south – east, it defines the middle of the morning working time.
4. *pietūs* or *pietai* 'south, noon, dinner'.
5. *pavakariūs* or *apývakarīs* and *apývakarė*, (*pusvakariai, priešvakaris* also *popietis, popietuvė* and *pusdienis*) 'about west', 'half west', 'before evening' also 'after south/noon/dinner' and 'half the day'. The Sun is half way between culmination and sunset. When the days are long, the time of an afternoon meal.
6. *vakarienė* 'westering, evening, supper'.
7. *pūsnaiktis* 'half night'; midnight.

*Priešpusryčiai* (LKŽ X 711) and *pavakariai* used to be added to the usual main time sequences when the days were longer than the night in summer. These minor time partitions are related to intermediate Sun positions, which also describe intermediate cardinal points.

The ethnographic data concerning the division of the day are documented by a German written source of the 17<sup>th</sup> century. M. Pretorius reports a division of the day in 15 parts. In fact he presents a general division in 4 parts, each of them subdivided respectively in 4, 3, 4, and 4 minor units (BRMŠ III 175, 282):

1. *Rytas* 'morning':
  - 1.1 *bregstims* 'break', 1.2 *priblindums* 'twilight', 1.3 *auszra* 'dawn', 1.4 *pusritis* 'breakfast';
2. *Pietus* 'noon':
  - 2.1 *uspietus* 'half noon, forenoon', 2.2 *tikkras pietus* 'proper noon', 2.3 *po pietu* 'after noon';
3. *Wakars* 'evening':
  - 3.1 *paludenis* 'half the day', 3.2 *apilope* 'time of foddering', 3.3 *prietemis* 'half-light', 3.4 *wakaris* 'evening';
4. *Naktis* 'night':
  - 4.1 *iszwakaras* 'threshold of night', 4.2 *immigis* 'deep sleep', 4.3 *guddumas* 'in the dead of night', 4.4 *gaidgyste* 'cockcrow'.

In the 19<sup>th</sup> century, S. Daukantas gives the detail of the original names for each of the 24 hours of the day (Daukantas 1976, 587):

1. *sambrėškis* or *brėkšta* 'the break of dusk', 2. *santėmis arba sutemo* 'dusk', 3. *vakaras* 'evening', 4. *nuovakarė* 'offdusk', 5. *išvakarė* 'outdusk', 6. *naktovidas* 'midnight', 7. *įmygis* 'deep sleep', 8. *pirmieji gaidžiai* 'first cocks', 9. *antrieji gaidžiai* 'second cocks', 10. *prieš aušrą* 'before dawn', 11. *aušta* or *švinta* 'dawn' or 'getting light', 12. *mažoji pusrytėlė* 'the minor half east/morning/breakfast', 13. *išaušo* 'dawn is over', 14. *saulėtekis* 'sunrise', 15. *didysis pusrytis* 'the major half east/morning/breakfast', 16. *priešpietis* 'forenoon', 17. *pietai arba pusdienis* 'south or noon', 18. *pakaitis* 'heat' (the nap), 19. *po pakaičio* 'after heat', 20. *po pusdienio* 'afternoon', 21. *pavakarė* 'before evening', 22. *mažoji pavakarėlė* 'the minor evening', 23. *vakarop* 'near evening', 24. *saulėlydis* 'sunset'.

Both documents partly cover and confirm each other, which is always a sign of authenticity. But we notice that the older list fills only partly the latter one. The discrepancies can well be caused by regional differences, but the important fact is that many of these tiny subdivisions are almost identical. We suspect that the nineteenth century compilation could be a distortion trying to fit into the modern 24 hours division frame of the day.

In order to determine the time of the day, the height of the sun over the horizon as well as its visible direction were taken into account. The most primitive way to determine Sun's height was to compare it to the height of a person or length of common tools. Low position of the Sun used to be described as being *per kačiargą* 'by poker', *per šienkartę* 'by hay-barling', *per grėblį* 'by rake', *per grėbliakotį* 'by handle of rake' over the ground. Sun's height over the horizon also used to be approximately measured in feet, spans, or even fingers. More precise measurement used to be expressed in units of Sun's disks: "The Sun was already three circles (disks) up and you had just left to mow" (EAA, Gaška 1985).

Another popular way to define time was to observe the length of a shadow and its changes of direction. It was very common to measure the length of one's own shadow in steps or feet. It is said that in midsummer at noon one's shadow equals one step. Thus shepherds used to bring their herds home at noon when they could step or jump over their own shadow. Quite often shadow length used to be measured in feet. There are references to different shadow lengths at noon – from 4 to 9 feet. In the afternoon, time used to be determined by the length of the shadow as well: "When the shadow is shortest, only one step long, they know it is 12 o'clock, that is exactly noon. And then in each hour it adds one step till 5 o'clock; after 6 in the evening the shadow lengthens by two steps. And similarly from morning till noon" (Butėnas 1935, 82). Elongation of the shadow due to the shortening of the day was also considered: "Now (1<sup>st</sup> of July) at noon the shadow is one step long. From St. Ann's day, the shadow will be two steps long because the night will be longer for an hour and a half.

It will be better for shepherds" (EAA, Laurinaitienė 1992). "In June the shadow is 4 feet. In each month the shadow lengthens by a foot. When you turn out the livestock in May the shadow is 5 feet long, in June–July – 4 feet, in August – 5 feet..." (EAA, Zablockis 1993).

The shepherds knew how to make a sundial. For that purpose they used to hammer a pole in the ground and drew a circle around it. Then they asked someone what time it was and marked the place of the shadow on the circle. The circle was then divided into 12 parts and the progression of the shadow indicated the change of time.

At home the determination of noon and other hours used to be observed on the south windowsill marked with stripes specially carved on it, or by noting the position of the shadow of the window edge on some notable place inside the room (Dundulienė 1982, 202): "When the shadow used to come through the window across the house to the threshold they said it is noon" (EAA, Legotienė – Vosyliūtė 1992).

Such a method was employed not only for common purposes, but for magical ones as well. It is told that an evil person would try to estimate the so called "bad minute" – that is the precise time when all curses would certainly come true. The curser on a sunny day would watch out what happened at his neighbour's place, and whenever he would notice something going wrong, he would then mark the "bad minute" by the position of the shadow of some certain object or the place where the Sunrays would fall, by hammering a nail or by carving a notch in that place. Later, he would wait for that specific time, when the shadow would reach the same place again, to cast his curses (Dundulienė 1992, 52). Worth mentioning that the so-called "bad minute" is very individual, belongs to a certain person.

It is essential to point out that a special meaning used to be attributed not only to some special moments in time but also to different regular time periods of the day. It was believed that the choice of the time for various events or activities influenced the future result. Therefore working and ritual activities used to be bound to well-determined moments of the day. For example, it was thought that the choice of different moments of the daytime for planting would play a good or a bad effect on plants and give them different qualities in the same way as, according to astrologists, birth time influenced people's character or destiny (Vaiškūnas 2001, 163). Thus great care was taken to time correctly all activities of everyday life.

### **Determination of the calendar time**

Even nowadays, when collecting ethnographic data in Lithuanian villages, one stumbles upon observation of the Sun for the determination of the calendar time. Up to day, some people use specific places of the landscape to mark the locations of the Sun at its extremes, for example: "On the *Seliutai* (a toponym, the land owner's family name) oak rises the Sun and its sets on the *Pamociškes* (another toponym) slope in February, and when the days are getting longer then March comes. When the day gets longer we say that the Sun rises on the

*Kalnas* hill. Every hill or elevation of ours has a name" (EAA, Česnuliienė 1994; Vaiškūnas 2003, 34). Here the familiar features of the local surrounding, such as a tree on the neighbour's property is used as a milestone in the calendar. The fact that country people were well aware of the directions of the rising and setting Sun not in the east and west but rather far in the north-east and north-west on the summer solstice days and that they observed it carefully is shown by the expressions used for these times of the year. The location of the midsummer sunrise and sunset are referred to as the *vasaros aukštieji rytai* 'High East of the summer'; and the *vasaros aukštieji vakarai* 'High West of the summer', and the directions of winter sunrise and sunset – the *žiemos žemieji rytai* 'Low East of the winter' and the *žiemos žemieji vakarai* 'Low West of the winter'. It is thought that during the early phase of the calendar formation, the observation of changes in sunrise and sunset directions determined the duration of calendar celebrations that were connected to summer and winter solstices (Vaiškūnas 1997, 20; 2003, 34). It has been noted that the changes in the sun azimuths slow down considerably at its extreme directions north or south. For some time the sun "stops" and its rising and setting points remain fixed. The determination of the duration of immobility depends of the precision of the observation. If we accept a precision of about a degree for the measures of the azimuth, people must have considered that the Midsummer Sun had reached its extreme position and standstill between more or less June 13<sup>th</sup> and June 30<sup>th</sup>, that is a period of up to 18 days. Sun standstill is documented to last the period between *Joninės* 'Feast of St. John' (06.24) and *Petrinės* 'Feast of St. Peter' (06.29): "The Sun *stovi vietoje* 'stands in one place' from St. John to St. Peter and then the days get shorter",<sup>1</sup> and they say about it that "the length of the day 'jumps back'" or, more often, that "the Sun jumps back" (Vaiškūnas 1997, 20; 2003, 34). The expression "jumps back" means the moment when the Sun returns from its northernmost azimuths. A close observation of changes in sunrise and sunset directions is reflected in one of the vivid expressions concerning the lengthening of the day after Christmas: "Between Christmas and Epiphany day becomes longer of a cocks step". The observation of the length of the Sun's path compared to the horizon was a natural mean of determining the length of the days and consequently the periods of the year, but another way of establishing the calendar was to employ a pillar or a stick as a gnomon and a sundial to observe its shadow length and direction. Here follows a more detailed description of such observations: "When the Sun moves furthest north the days are longest. Then it is St. John. The longest days were determined in the following way. Take some tree in the middle of the fields or something isolated and free from shadows. One day the shadow of the tree will be marked at sunset: the shadow is marked by a pole. The next evening the procedure will be repeated [...] When the shadow of the tree reaches the furthest point (to the south), and starts to go backwards, it was considered to be the longest day" (LTR 4508/17; Vaiškūnas 2003, 37).

<sup>1</sup> This can be the remnant of an older calendrical tradition, as we know the standstill is now on June 21<sup>st</sup>. Or could have a purely ritual value attached to these two saints.

A mast or a tree was also used to observe the shadows length and determine the dates of agricultural activities: "Shadow length at noon was used by people to determine the beginning of haymaking" (VUB F81-1050, Gaška 1985). Other objects could also serve the same purpose, and in homesteads, poles were specially raised: "Father used to say that the pole in the yard has been planted near the gate and a piece of iron was on it, and it was used to measure time" (EAA, Kalvaitienė 1994). Another example of such a pole is the Fat Tuesday's pole which has a wheel on top. The inhabitants of Skuodas used to hang and burn *Morė* – the jackstraw of Fat Tuesday on it: "The wheel would be left unburnt, and on sunny days its shadow would show the time" (Kudirka 1992, 30). It is also known that the gnomon was used for complex time calculations and meteorological prognosis of the forthcoming year. P. Zablockis from the village of Kražiai witnessed his father and illiterate grandfather using different poles to mark calendar months depending on the length of the shadow. A vertical pole of about human height was used for that purpose. On the 20<sup>th</sup>-22<sup>nd</sup> day of every month the length of the shadow would be marked with a stick for each specific month. Six spikes were used. The weather of the current month was marked on the sticks. From June to Christmas, while the shadow got longer, notches were made to the western side of the sticks, for rainy days and to the eastern side for sunny ones. From Christmas onwards, the sticks were marked to the north for rainy or snowy days, and to the south for sunny ones. The sticks were kept as a primitive agenda, and consulted for future prediction of the weather. The same weather conditions were believed to return after every five years (EAA, Zablockis, 1994). The mention of a five years span is of course an important information as it recalls us of Celtic and Indian traditions.<sup>2</sup>

## II. The Moon

The common term used for the Moon is *Mėnulis*, but another word, *mėnuo* means at the same time the celestial body – Moon and the time period of a month. This name directly derivates from the Indo-European base *\*menes-*, *\*men(n)s-*, 'moon' and 'month', and have a more general meaning of *\*me-* 'measure' (DSS 54). So, the Moon was used as the natural cosmic instrument of measuring time.

<sup>2</sup> For the Celtic "Coligny Calendar", see: J.M. Lecontel, P. Verdier, *La mesure du temps chez les Celtes, une relecture du calendrier de Coligny*, "Publications de l'Obs. Astr. de Strasbourg, Serie Astronomie et Science Humaines", 1988 No. 2, pp. 117-134, and other papers on the same subject in the following numbers of the same publication: Nos. 3, 4, 8, 9; for the Indian five years calendar, see: A. Karp, *W poszukiwaniu doskonałości*, "Czas i Kalendarz", Papienska Akademia Teologiczna, Kraków, 2001, pp. 273-292, p. 279, citing A. Narahabi, *A note on the Five Year Yuga of the Vedanga Jyotisa*, "Electronic Journal of Vedic Studies" (EJVS) 1997, No. 3-4, pp. 21-28.



**Daytime measurement**

The Moon was used for night timing by noting the positions of Moon's different phases in respect to different parts of the world. It is especially easy to do this during the fullmoon when the Moon is opposite to the Sun then under the horizon and in the night sky it repeats the day sky movement of the Sun: it rises in the evening, culminates at midnight and sets at dawn.

**Calendar time determination**

Though Lithuanian chronology has unfortunately not yet been extensively explored and too little data about old calendar systems has been collected, it is still thought that the Moon cycle was of common use. One of the proofs may be

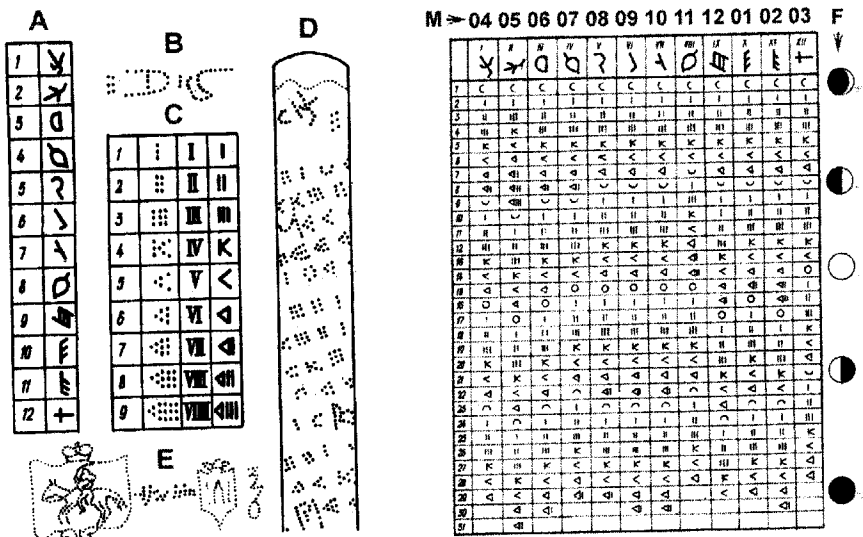


Fig. 1. Calendar stick (D) and explicative tables of the calendar signs written on it: A – the signs of the lunar months, B – an undecipherable inscription, C – the days of the lunar week, E – the armorial marks and an undecipherable inscription, F – Phases of the Moon, M – interpretation of the signs of the lunar month according to M.M. Gusev.

the description of a calendar stick explored by the 19<sup>th</sup> century Vilnius astronomer M.M. Gusev (Гусев 1865, 335–354). This stick dating to the 14<sup>th</sup> century was found under the ground on the slope of the Strėva river in the Trakai region. It is a stick with a copper-bound end and a spiral inscription (marks). Marks consist of many small nails (Fig. 1 D). M.M. Gusev determined that the spiral markings represent twelve lunar months (Fig. 1 A) and days of the week. Every month is marked with a different original sign and begins with the new moon crescent (Fig. 1 F). M.M. Gusev found out that month marks depict phenologic aspects of the months and the main agricultural works. According to his opinion, the year in this calendar starts from April (Fig. 1 M). So the first month is

represented by a descending pigeon (Lith. April – *balandis* 'pigeon'). Weekdays are marked with original local tradition of writing numbers, somehow similar to the Roman (Fig. 1 C).

In the Great Lithuanian Dukedom, already before Christianity, the Julian calendar was used together with both the Byzantine chronology (counting years since the creation of Earth – Annus Mundi AM – 5508 years before Christ), and the Roman Era count (counting from birth of the Christ – Anno Domini AD). But conservative folk still used phenologic and Sun-Moon calendar for their agricultural needs much later. Lithuanian traditions of the 19<sup>th</sup>–20<sup>th</sup> centuries are rich with examples of coordination of Sun and Moon cycles. Even recently recorded stories still tell about the differentiating between "heavenly months" and "earth months". It is said that the "heavenly month" starts earlier than the earthly one, therefore it can be used to judge the upcoming calendar month: "On the sky the months are counted. My mother knew that. Now the haymaking is coming but on the sky a different month comes. On the sky July, it goes by one month ahead. On the Earth nobody cuts hay but the sky shows haymaker. The sky month determines which one is coming. If our month comes first there is no knowing. When the sky showed the month with snow and rain, then we see what month is coming" (EAA, Mažrimas 1992). This statement refers to the fact that the beginning of the lunar month and its name may precede the beginning of the corresponding solar month. The solar cycle was the main phenologic indicator, but the Moon variations were also very important in the life of farmers. The changes in Moon phase changes was divided into two main lunar periods – *jaunas* 'young' (waxing Moon) and *senas* 'old' (waning Moon), which were further separated from one another by – *tuščias* 'empty' (New Moon) and *pilnas* 'full' (Full Moon) phases. Each of two main Moon phases already mentioned was again divided into *priešpilnis* 'before full' (Waxing Gibbous), and *senagalis* 'old end' or *delčiagalys* 'wane end' (Waning Crescent).

Moon variations in folk tradition even nowadays are quite important – they are usually related to favourable and unfavourable time periods. A lot of country folk still strongly believe that various agricultural activities should be coordinated with different Moon phases. Whatever is started while the Moon is waxing is supposed to grow and proliferate too, while what is started during the decay of the Moon, decays and shrinks as well. Therefore the period of growing Moon is sometimes called *dosnus* 'generous', while decrescent Moon is called *šykštus* 'skimpy'.

It is worth explaining here in more detail the opinion of the people about favourable and unfavourable Moon periods, because such attitude obviously demonstrates an archaic attitude to the natural environment and time. The analyse of an abundant but contradictory ethnographic data about the coordination of various agricultural activities with the Moon phases shows some general regularities in the popular categories of positive and negative aspects of Moon phases:

- I. The waxing Moon is supposed to be favourable to the growth in general and for any starting processes. Still to day, we observe important variations in the acceptance of the start and end of this period:
  1. While the Moon grows from the first crescent to the first quarter (Waxing Crescent) all starting processes will undergo a strong growth. They say that during that time plants grow into stems, leaves, blossom abundantly, and that even foundation stones under construction, come up to the surface. This period is bound to strong growth, luxuriance, humidity, liquidity, and at the same time tenderness, softness, and weakness. Though active vegetation takes place, it is not fruitful. It is a favourable time for various pests.
  2. The growth of the Moon from the first quarter to the full Moon (Waxing Gibbous) is also favourable to all growing processes but this time it will be also fruitful, leading to full-fledged formation of the fruit, to maturity.
- II. Although the whole second period is associated with decay and wane, its first and second part are somewhat different as well:
  3. It is a common belief that the period of shrinking of the Moon from the full Moon to the last quarter (Waning Gibbous) is the least favourable to start anything. Everything started during that period is condemned to decay.
  4. The period that starts after the last quarter (Waning Crescent) presents certain positive aspect of the waning process. Therefore the last crescent is again considered as favourable for all activities bound to conservation or even sterility. It is a time to prepare all the food conservation, to cut timbers, to salt or smoke meat, etc. It seems as if an additional force pointing downwards came to action, and therefore offers also favourable conditions for planting beets and root vegetables, gathering their energy underground.

At the end of the month, when the Moon vanishes from the sky for 2 or 3 days, there is a period, which is believed to be a "time in vain" and any work would be done in vain (Vaiškūnas, Lovčikas 1999).

As we see, the observation of Moon changes used not only to mark calendar time, but was also indicating some sort of time quality. Though it is now often heard that the phases of the Moon "have an effect", namely that they influence various phenomena, folk tradition does not speak of any direct physical influence of the Moon.

It seems that the popular old tradition pictures the Moon not only as a time marker or even a time factor but also as a quality mark for certain time periods. But all this is difficult to establish with certainty, because it has been also often observed that the favourable and unfavourable Moon periods are absolutely parallel to menstrual cycles. Does the general symbolism of growing in the nature accords with the visible aspect of the Moon? Or is it rather that a certain time has a growing quality influencing the whole of nature including the Moon? In fact, such logical questions have no object in folk culture, based only

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on direct observation and logical-symbolical classification. This is confirmed by the general confusions found in all Indo-European languages between the categories of chronological time and weather conditions.

### III. Stars

During the late autumn or winter, when people got up still in the dark, they used to estimate the time according to the position of prominent stars or constellations in the sky. According to ethnographical data we know that in the 19<sup>th</sup>–20<sup>th</sup> centuries they were:

1. Pleiades (Lith. *Sietynas*, *Sietas* 'the Sieve', *Žvaigždžių sietas* 'Sieve of stars').
2. Orion (Lith. *Šienpjoviai*, *Šienpjūviai* 'the Mowers', *Kūlėjai* 'the Threshers', *Trys karaliai* 'Three Kings').
3. Ursa Major (Lith. *Gryžulo ratai* 'Grižulas wain', *Grigo ratai* 'Grigo wain').
4. Venus (Lith. Morning Star – *Aušrinė* 'Dawn (star)' and Evening Star – *Vakarinė* 'Vesper').

Night time was determined by memorizing the positions of some constellation relatively to the horizon at various moments of the night. For the date determination people waited for some constellation to appear in the cardinal positions (rising, culmination, or setting) just before sunrise or just after sunset. For this purpose the following annual observable positions of near ecliptic stars are especially convenient:

1. *Morning (heliacal) rising* – the first appearance at the eastern horizon in the morning dawn before sunrise.
2. *Morning culmination* – culmination just before sunrise at the end of night.
3. *Morning setting* – setting just before daybreak.
4. *Evening (achronal) rising* – rising just after sunset.
5. *Evening culmination* – culmination just after sunset.
6. *Evening (heliacal) setting* – the last visibility in the evening after sunset.

#### 1. Pleiades

##### 1.1. Hour estimation

During long autumn and winter nights people could guess the time quite precisely according to the movement of the Pleiades. That is why they are sometimes compared with a clock: "*Sietynas* shows time as a clock" (LTA 1300[4]),

"*Sėtynas* served as a clock for us in Butniūnai..." (LTR 4286[121]). People noticed that the Pleiades cluster, situated near the ecliptic, moves during long November nights in similar fashion as the summer Sun: "that *Sietynas* goes just like Sun in summer, in the same path". People used this correspondance to guess the hour of the night in a similar way as they did during daylight with the Sun. In November the Pleiades culminate at about midnight and it was known that: "when *Sietynas* rises up – that means it is before midnight, when it goes down – it is after midnight" (LTA 2256[103] also: LTA 2246[51], LTA 2249[81], LTA 2312[414]); "*Sietynėlis* is going down, the day will come soon" (EAA, Čibirienė 1989). People could guess the time even more precisely. If the Pleiades are in the East and as they say "takes one quarter of the sky", that means it is 8 p.m. If they are in the "middle of the sky" that means it is midnight. And if they are turned to the west and "take half of the sky" – it is 3 a.m. (LTA 2260[88] also: LTA 2312[418],[423]; LTA 2240[62] etc.). People guessed the time from the position of the Pleiades according to separate objects of the surroundings: "*Sėtynas* on the granary, so let's go to bed" (LTA 2257[184]); "*Sėtynas* /.../ on the granary it's time to get up" (Vaiškūnas 1993a, 20; 1999a, 227).

In September people got up to trash when the Pleiades were in the south-east (LKŽ XII 534). In October – when they were culminating. At that time the time was guessed in the following way:

The Pleiades rise – it is evening.

The Pleiades in the south-east – it is 8–9 p.m.

The Pleiades are in the south – it is 2–3 a.m.

The Pleiades are going down it is 7–8 a.m. (LTA 2312[420] and also: LTR 4286[123], LTR 4287[26]).

In December about Christmas the culmination of the Pleiades (2-3 hours before midnight) was the sign for children to go to bed (EAA, Armonaitytė 1992; Vaiškūnas 1993a, 20; 1999a, 227).

## 1.2. Timing of agricultural activities and meteorological observations

Ethnographical data show that some particular days of the year were associated with the following positions of Pleiades:

1. Evening (heliacal) setting (April 23).
2. Morning (heliacal) rising (July 10).
3. Morning culmination (September 15).
4. Morning (cosmic) setting (November 30).

According to these ethnographical data, the heliacal setting has been considered especially important.

### 1.2.1. Evening (heliacal) setting

The heliacal setting of Pleiades was associated with St. George's day (April 23). This position of Pleiades indicated the beginning of spring and outset of agricultural activities. It was known that the lower the Pleiades appear after the sunset, the nearer the spring is. People said: "If *Žvaigždžių sietas* 'the Sieve of stars' is high, so spring is far" (LTA 2319[13]); "If the *Žvaigždžių sietas* 'the Sieve of stars' went down with the evening glow, it would be warm (spring) soon" (LTA 2259[89]); "*Sietas* disappears and a cuckoo starts to call" (LKŽ XII 532). When the Pleiades entered the evening glow people started to plough fields, got ready for spring sowing. It was said: "*Sietynas* in the glow, the bull in a furrow" (EAA, Jezerskis 1992 and Vaiškūnas 1993b, 332); "*Sietynas* in the glow, the grey (horse) in the meadow (just before St. George)" (EAA, Andriukaitienė 1992); "If *Žvaigždžių sietas* 'the Sieve of stars' is not in the glow it's not yet the time to let your horse into the meadow" (LTA 1480[22]; Vaiškūnas 1993a, 21; 1999a, 228).

### 1.2.2. Morning (heliacal) rising

In early July, when the Sun takes distance from the Pleiades, they become visible again over the north-eastern horizon. As many other nations worldwide, the Lithuanians apparently also associated the beginning of summer's rainy days with the heliacal rising of the Pleiades (Allen 1963, 398; Gładyszowa 1960, 161, 170–176; Lebeuf, 1996). The first visible (heliacal) rising of the Pleiades coincides roughly with the folk calendar's day of the seven *sleeping brothers* (July 10). Accordingly to the weather on this day people guessed the quantity of precipitation for the second half of summer. They felt sure that if it is raining on that day, it will be raining for 7 days, or even 7 weeks. The relation of the 7 stars of the Pleiades with the day of the 7 *sleeping brothers* is proved by a legend according to which the stars of the Pleiades are 7 brothers who fell asleep in the basement of the church built by themselves (Vaiškūnas 1994, 17–18; 1999a, 223–224).

During hay harvesting, the forecasting of the rainy days during the end of summer time was very important. Summer mostly ends with rainy days in our country. As the widespread saying goes, "In vain even the entire folk begs for the rain before St. John, whereas later on just a single voice serves" (LT V 383). The Russians also waited for the appearance of the Pleiades at that time. They even called the 11<sup>th</sup> of July (old style) *Яфимии стожарницы* (Russ. *Стожары* – the Pleiades; КГ 280).

### 1.2.3. Morning culmination

The other significant position of the Pleiades was their culmination before the sunrise, which indicated the middle of the autumn sowing period. In the 17<sup>th</sup> century M. Pretorius wrote that a certain position of the Pleiades was a good

sign for the start of sowing (BRMŠ III 176, 283). People said that God had put the Pleiades into the sky for people to know when it was time to sow rye (LTA 2247[20]). "If *Sietynas* comes to the south before dawn, it is time to sow rye" (LT 382); "*Sietynas* turns to the south, it means time has come to sow rye..." (LTR 4508[7]). When the Pleiades appeared in the south-west before dawn, it was the end of September and people picked potatoes (Vaiškūnas 1993a, 21; 1999a, 229).

#### 1.2.4. Morning (cosmic) setting

The setting of the Pleiades in the morning dawn has been associated with the start of Advent period. Despite the official ecclesiastical calendar, which started Advent at the fourth Sunday before Christmas, folk tradition begins it at the St. Andrews (November 30). The return of longer days was expected if the Pleiades set before Advent, and vice versa. If the Pleiades set before morning, it was an indication that the Sun would soon return: "They say, when the *Sietynas* goes down before Christmas, so the day is already getting longer" (LTA 2261[39]; Vaiškūnas 1993a, 21; 1999a, 229).

#### 1.2.5. Evening (achronal) rising and evening culmination

Very little lore is left about the first evening rise of the Pleiades. In October, when the Sun is down, they are already seen in the east: "In the evening it (the *Sietynas*) is in the east. Then it comes later and later. That means that later it won't be seen in summer" (EAA, Laurinaitis 1992). Nevertheless, this position of the cluster might have been originally associated with some form of Day of the Dead celebrated during the October/November boundary (later replaced by the Christian All Hallows Day and Halloween celebrated during November 1 and 2). Many peoples associate this position of Pleiades with the rites of the dead (Allen 1963, 401).

We lack information about the observation of the evening culmination of the Pleiades. All we know is that "*Sietynėlis* is in the middle of the sky in the evening and it goes down where the Sun rises. Then we know that the day will come soon" (LTA 2247[44]).

## 2. Orion

### 2.1. Hour estimation

Orion (*Šienpjūviai*, *Šienpjūviai* 'the Mowers', *Kūlėjai* 'the Threshers') was used for this purpose in a similar way as the Pleiades. The rising of Orion by the end of summer was a signal to get up: "As *Šienpjūviai* have risen, it was time to get up. Maybe around four or so turned up" (EAA, Leonavičius 1989). Or, "*Šienpjūviai*, so to say, around September are eastwards. I call up, when ranging horses, if *Šienpjūviai* appear, then the dawn starts, (...) and as they came out to the full, then we must go to Suvalkai, because it is morning already"

(EAA, Krakauskas 1989). Indeed, Orion, following some period of invisibility, appears first in the eastern sky just before sunrise, and then rises constantly and become quite visible in the morning by September. During late autumn, people used to get up when Orion had already moved to the South: "...as *Šienpjūvės* were just about south then folk took ride to the town, Suvalkai that is. This was a good time" (EAA, Krakauskas 1989). In November people got up when Orion moved from south to west, and in December – when it set. People noticed that in December Orion moves in the sky "like the Sun in summer": "In winter *Šienapiūviai* go like the summer Sun. When *Šienapiūviai* come where the Sun is at noon, then it is just midnight..." (LTR 4235[268]). So, during the long December nights this constellation served as a fine time mark. It rises at east in the evening, culminates at south by midnight, and sets at west before morning.

During the long nights of Advent people got up to threshing when culminating Orion shone in the South (as the saying goes: straightly, flatly, directly against south, upright, midway the heaven) i. e. just about midnight or a bit later, after culmination: "When the night is great, time is learned from *Šienapiūviai*: when they rise, is just after evening, when they are high, then it is midnight, when they go down, then dawn nears" (LTR 4235[105]); "*Šienapiūviai* rise in the east. Around twelve they are upright. When they begin to get down, then for us it is time to get up. Some people can even tell the hour by The Mowers" (LTR 4235[178]); "By *Šienpjovės* – they told which time it is. When to get up. When straight in the south, then they got up. They guessed the time only around Christmas, when nights are long" (EAA, Vaitonienė 1984);<sup>3</sup> "At winter, when nights are great, The *Šienapjūviai* are very visible. When they straight (in south – J.V.), then just about midnight (like 12 in older days), and when a bit turned round, then some two o'clock... time to get up and go threshing the rye. As by summer, *Šienapjūviai* are almost not seen" (LTR 4235[321]).<sup>4</sup> It is because of this that the position of the constellation has been associated with the time of threshing, Orion in some places has been called *Kūlėjai* 'Threshers', *Spragilas ir kūlėjas* 'Flail and Thresher' (Vaiškūnas 1996, 142; 1999b, 168).

## 2.2. Estimation of calendar day

The very name of Orion *Šienpjoviai* 'The Mowers' might come from the fact that their morning (heliacal) rising occurring at the beginning of August coincides with the beginning of the second turn of hay harvesting and with the harvesting of rye. In any case, in Eastern Lithuania, the mowers have been also called simply *Pjovėjai* 'The Croppers' because their heliacal rise was the time to stand up and start beating the crops: "*Šienpjoviai* 'The Mowers' are seen in the morning near the place where the Sun rises. And when they come up, it is good to get up to move cattle, and to mow hays" (EAA, Žibudienė 1989); Those *Pjovėjai* 'The Croppers' just rise – let us get up, for *Pjovėjai* are up. They rise, take scythe, ding-dong, to the meadows. This way it goes" (LKAR 2/228/).<sup>5</sup>

<sup>3</sup> Also see Gładyszowa 1960, 197, inkr. 281.

<sup>4</sup> Also see: LTA 2261[41]; LTA 2257[182]; LTA 2257[189]; LTA 2312[422]; LTR 4235[149]; LTR 4235[49]; Gładyszowa 1960, 186, inkr. 64; 187, inkr. 104.

<sup>5</sup> Compare in Polish: "O, już kosy wschodzą (rano), to już jesień jak już koszą drugie siana, tj. po żniwach, czyli 21 IX. Powiadają mądrzy ludzie: już będzie jesień, bo już kosy wschodzą" (Gładyszowa 1960, 188).



Because of its position relatively to the ecliptic, Orion is a good indicator of day lengthening during winter solstice, when it is almost in opposition to Sun and rise just after sunset (evening, or achronal rising). Noticing the elevation of Orion over the horizon immediately after sunset it was possible to estimate the degree of day lengthening. Whereas by Christmas the three prominent Orion stars are barely visible just after sunset, by the *Three Kings Day* (The Epiphany or Adoration of the Magi celebrated on January 6<sup>th</sup>) they are already approximately 6 degrees above the horizon at dusk. Such well noticeable increase in altitude of the constellation was a good indicator of the length of the days. This 'step' made by Orion probably is reflected in a widespread folk saying that "from Christmas till *Three Kings Day* the day extends by the step of a rooster". The association of the constellation with the Adoration of Magi is supported by another extant name of the Orion – *Trys karaliai* 'Three Kings'. On the base of folk materials from the Švenčionys district, P. Dundulienė says explicitly that from Christmas till Three Kings Day "day becomes longer by the step of a rooster, or by the leap of a ram, i.e. the way made by Orion" (Dundulienė 1988, 57).

### 3. Ursa Major

#### 3.1. Hour estimation

During clear weather, the circumpolar constellation of Ursa Major (*Grižulo ratai* 'Grižulas wain', *Grigo ratai* 'Grigo wain') which is never setting, was used as a good time marker: "*Grigo ratai* they ascend in evening. One can estimate the time (by their position)... The Polar star stays in its position, but the *Grigo ratai* are going around the Pole star; and when the night is long they appear on the

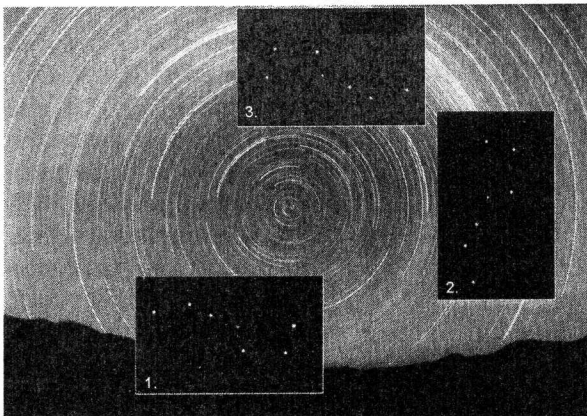


Fig. 2. Positions of Ursa Major in November and December:  
1. Evening; 2. Midnight; 3. Morning.

left side of the pole star. /.../ They spin each day" (EAA, Blazgys 1992). Such position of Ursa Major is observed in January – March. But, as ethnographic data indicates people better recall Ursa Major positions of long November – December nights (Fig. 2) It was noted that the "thill" ("horses" or "stallion" – Eta, Zeta, Epsilon UMa) of *Grižulas's wain* are at that time always directed towards the Sun, still situated under the horizon, and that is why Ursa Major

served as the very useful indicator of the hours of night: "Humans guess the time according to *Grižulo ratai*, because it always moves with his thill towards

the Sun. It is the clock of the sky" (LTA 2259[105]). The orientation of the "thill" (or the "horses") of *Grižulas's wain* towards the West indicated evening (Fig. 2.1), while their orientation downwards to the horizon, towards the northern azimuth indicated midnight (Fig. 2.2). When they point to the east they indicate the coming morning (Fig. 2.3): "In the evening, the horses of *Grižulo ratai* face to the northwest, at midnight – to the north, in the morning – to the east" (LTA 2260[87]) and "In the evening, the thill is towards west, in the mornings towards east, turned in the direction of dawn" (EAA: Deveikienė); "...When the thill turn towards east side, its means that the day is coming" (Davainis-Silvestraitis 1973, 162).

Ursa Major used to be described as standing in the south, being "near the middle of the sky", high above head or visually characterized as "overturned cart" in their culmination. The position of this constellation in November – December was used to determine the time to get up: "If the *Sietynas* (Pleiades) is low and *Grižulio ratai* is upside-down it means that the day is coming up soon" (LTA 2316[35]). Quite often such a position of this constellation was described as Ursa Major being "on the roof". The master of the house used to say: "*Grižratis* is already on the roof, it's time to get up!" (EAA, Martišius 1992). A neighbour who used to sleep long used to be spurred on by – "Juliau, Juliau (a name) get up! / – What is that? / – *Grigo ratai* is on the roof! / – Probably it was brought by the devil there!" (EAA, Juodaitis 1992) or: "Juožai, get up, *Grižulo* is on the barn!" (EAA, Spangelevičius 1992).

Sometimes, by comparing the morning and evening position of Ursa Major, it is said that they "turn around" before the day, or "turn over" or "reverse": "*Grižulio ratai* turn around before day" (LTA 2254[67], LTA 2255[72]); "*Grižula ratai* turn around before day and *Sietynas* (Pleiades) go to west" (LTA 2246[50], [52]); "*Griga ratai* in the evening is on one side but later it turn over to another side" (EAA, Jonadt-Šimėnienė 1990); "*Ratai* already had turned – it means that morning is coming they say" (EAA, Leonavičius 1989).

Sometimes it is explained that *Grižulo ratai* before the morning turns or faces to the East: "*Grigo ratai*. Before day it turns to the east" (EAA, Maciulevičius 1993); "If the

*Grižulo ratai* are facing the east it is going to be morning soon" (LTA 2257[188]; EAA, Maciulevičius 1993). But during the collection of materials in fieldwork, statements are often puzzling, because sometimes, they do not mean the direction of "the thill" but speak of the position of the constellation as a whole. And then, this does not indicate the morning and evening hours in November – De-

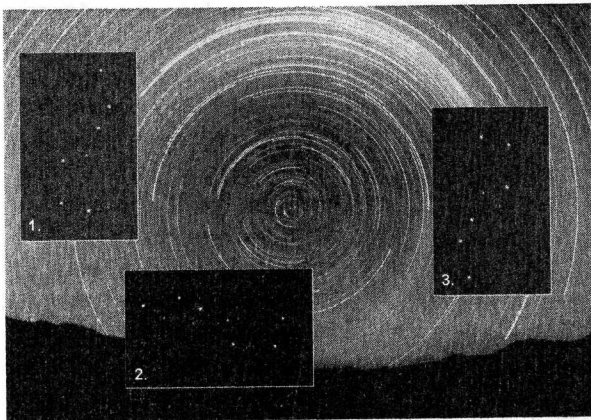


Fig. 3. Positions of Ursa Major in end of August and September: 1. Evening; 2. Midnight; 3. Morning

cember but rather at the end of August and in September (Fig. 3). This position of Ursa Major was a good indicator for the villagers, who guarded their horses in the pastures: "I remember that when we were guarding the horses at night, the sky was clear. The wheels were up and the thill was pointed to earth, and we knew that day soon would come" (EAA, Kuliešius 1989) (Fig. 3.3).<sup>6</sup> Such a situation appears only in late summer and the beginning of autumn: "Wheels down, and the stallion up: evening. And when the stallion is down and the wheels up: morning is near (so was it when we guarded the horses at summer night" (EAA, Savulienė 1987) (Fig. 3.1,3).<sup>7</sup> So midnight at that time was indicated by the constellation straight in the north, close to the horizon, the same as during the evenings in November (Fig. 3.2): "If *Grįžulio ratai* is in the north – midnight" (LTA 2312[418]).

#### 4. Venus

It was also common to determine the approaching morning by the morning rise of Venus – Morning Star (*Aušrinė* 'Dawn (star)'). With *Aušrinė* rising people used to get up and start working too: "Well, there this *Aušrinė* star could be seen in the east by the morning. Then soon the dawn breaks and it (the star) disappears. No need for a clock – you spot it and you know it will dawn" (EAA, Nenortienė 1990); "Boys used to say – let's scamper away from girls – the Morning Star has already risen – we will have to hammer the scythe. Already before the sunrise we hammer the scythe and go hay harvesting..." (EAA, Dubinskis 1992). Women used to sing an altered strophe of the morning song to the overslept lady: "Hello the bright Morning Star, / the mistress still puts her legs up" (EAA, Jezerskis 1992 and Vaiškūnas 1993b, 332). These resemble strikingly the cuneiform inscription in a list of astrological prognostications: "When Venus is high, brilliant – pleasure of copulation".<sup>8</sup>

Approaching morning used to be deduced from the height of Venus over the horizon: "When we used to wake up without a clock – it is cockcrow. We used to wake up and check *Aušrinė*. When *Aušrinė* is seen – time to wake up. (When? In winter or in summer? – Question by J.V.) Not needed in summer since nights are short. We used to look up in winter when nights are long. ... Maybe it used to rise after twelve, but it could not be seen. Would check the height of *Aušrinė*... They say when *Aušrinė* is in one *sagene*<sup>9</sup> high it is time to get up. ... They mostly watch in December. In November not as often. ... *Aušrinė* shows time as a calendar or a clock" (EAA, Savickienė 1992). "They used to guess the time according *Aušrinė*. The higher *Aušrinė* is the latter time it is. ... When you are outside then you see how *Aušrinė* is gaining height. ... When *Aušrinė* has already arisen they say it is morning" (EAA, Čepulienė 1994).

<sup>6</sup> Comp. in Polish: "Kiedy dyszel od woza na dół pokazuje, jest czas do wstawania" (Gładyszowa 1960, 152).

<sup>7</sup> Item "Before day its (Ursae Majoris) thill pointed downward" (LTA 2249[83]).

<sup>8</sup> B.L. Van der Waerden, *Science Awakening II: The Birth of Astronomy*, Leyden 1974; quotation after Lebeuf 1995, 595.

<sup>9</sup> An ancient measure, the distance from one hand to the other with extended arms.

On flax breaking or flailing nights, workers used to get food according to Venus rising: "When *Aušrinė* is rising they are eating first time on flax breaking" (J 178; LKŽ I 513); "Before *Aušrinė* rises, on flax breaking they are warming the beer for the workers" (EAA, Dargėnaitė-Beniušienė 1994). Because of that this eating was called *aušrinė* (LKŽ I 513).

The rising of Venus – Evening Star (*Vakarinė* 'Vesper') was the sign to finish work (EAA, Grigas 1992). When the Evening Star sets it is time to go to bed (LTR 4508[27]).

#### IV. Time conception in traditional Lithuanian culture

A cosmic wheel is the best image to express the idea of the circular calendar year based on azimuth observations of sunrises and sunsets. The wheel visually conveys together the idea of time and space, as well as the idea of physical and spiritual cycles of human life (Razauskas 2000). A rolling wheel represents as well the time cycle of the day. The formal similarities in the changes of both natural cycles could be expressed by the same image of the wheel, a circle, or a closed cycle. This symbolical isomorphism equals day to summer, night to winter, dawn to spring and dusk to autumn. Further, noon and midnight are equivalent to summer and winter solstices and sunrise and sunset to spring and autumn equinoxes. This model associated with the Moon cycle (monthly cycle) and the proper movement of the starry sky produces a complex model of wheels of time, which expresses the time conception in traditional folk culture as Mircea Eliade has shown (Eliade 1959). This fundamental idea of time as a wheel or a circle was never conceived independently from its spatial correspondence, or wheel of the world. So the same cardinal solar directions were used to name also basic time divisions of days and years and served as a general frame for popular worldview (Vaiškūnas 2005). In this cosmology this cosmic wheel appears as an integrated system of time and space coordinates perceived as a whole and can properly be named a chronotope. This chronotope includes all the aspects of human life and its surrounding. The life of man itself with its landmarks of birth, youth, mature age, old age and death reproduced the same division and give birth to such expressions as the spring or the morning of life, or its autumn, the dusk of life, etc. The practice of celestial observation left marks in the general world-view. For example the equivalents of the term *cosmos* are in Lithuanian *Pasaulis* – the World, the Universe, but means literally the *space under the Sun*, *Space that opens due to the sun* that is to say – space being created and limited by movement of the sun. The same is in Russian *Свет* meaning 'light' – the World, the Universe, as the place which becomes visible, distinct at dawn. As if the time and the space texture of this world was created by the cyclic dynamics of the light or lights (Sun and other celestial bodies). The movement of the Sun in respect to the Earth observed during the day and year cycles has led to a 4, 6 or 8-parts model of space-time structure. In the folk world-view time is not a monotonous homogeneous stream that can be divided into similar units that have no quality (Greimas 1990, 189–190), "time is not an

empty form, but has its quality, every instance is specific" (Gurevičius 1989, 89). The Moon cycle, in which every interval has its own quality demonstrates vividly this archaic heterogeneous conception. Moon in its growth and waning is a main indicator of the quality of time. The same can be said about the Sun and the stars, which not only serve as time markers, but also indicate favourable or unfavourable conditions.

## Acknowledgements

The author wishes to thank the Organizing Committee of the conference and personally Dr. Arkadiusz Sołtysiak for great help in providing the possibility to present this paper to the scientific community. The author is most grateful to Dr. Arnold Lebeuf not only for great help in preparing the English version of this paper but also for fruitful discussions.

## Abbreviations

- BRMŠ** *Baltų religijos ir mitologijos šaltiniai*, vol. I: Nuo seniausių laikų iki XV amžiaus pabaigos, 1996; vol. II: XVI a., 2001; vol. III: XVII a., 2004 / Sudarė N. Vėlius, Vilnius.
- DSS** *A Dictionary of Selected Synonyms in the Principal Indo European Languages by Carl Darling Buck*. The University of Chicago Press.
- EAA** Personal ethnoastronomy archives by J. Vaiškūnas (specified in the "Unpublished sources" section below).
- J** Юшкевич 1904.
- LKAR** Archives of people's art at the Lithuanian Folk Culture Centre, Vilnius.
- LKŽ** *Lietuvių kalbos žodynas*, vol. I, 1968; vol. X, 1976; vol. XII, 1981, Vilnius.
- LTV** *Lietuvių tautosaka*, vol. V, Vilnius, 1968.
- LTA** Archives of Lithuanian folklore. The materials in this archive now belong to LTR (see below). LTA and LTR are distinguished in the article in order to help the reader separate older information (LTA information was recorded between 1935 and 1940) from more recent data (LTR information has been recorded since 1940).
- LTR** Archives of manuscripts of Lithuanian Folklore in the Institute of Literature and Folklore at the Lithuanian Academy of Sciences, Vilnius.
- VUB RS** Manuscript Department in Vilnius University Library.
- КГ** *Круглый год. Русский земледельческий календарь / Составитель А.Ф. Некрылова*, Москва 1989.
- СД** *Славянские древности: этнолингвистический словарь в 5-ти томах / Под ред. Н.И. Толстого*, Т.1: А–Г, 1995; Т.2: Д–К, 1999; Т.3: К–П, 2004, Москва.

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