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Northeast Siberian Astronomical Terms

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Abstract

In this paper, we shall have a look at series of astronomical terms and their etymologies in a historical context, including etymologized and non-etymologized terminology in Yakut (Turkic), Written Mongolian, Dagur and Khalkha (Mongolic), Ewenki (Tungusic) and Yukaghir. It is noteworthy that most of these languages had only rudimentary astronomical terms (sun, moon, star, sky, some constellations) before the creation of a richer cosmology with terms borrowed from other languages or through creative compounding processes. Yakut, Ewenki and Yukaghir have mostly been the recipients of Mongolic forms, while Mongolic has borrowed from Turkic, and seemingly from the more advanced Sanskrit and Tibetan early societies. The paper is intended as a primer on these subjects, with some discussion and some new findings presented (including a few borrowings, and etymologies for some Yakut planet names).

Keywords: astronomy, Yakut, Ewenki, Ewen, Yukaghir, Mongolic, Tibetan, Sanskrit, lexical borrowing, Middle Mongolian rudimentary astronomy

Introduction

There are perhaps no more revealing details about the world view and knowledge of ancient cultures than their astronomical observations. Knowledge of astronomy in Siberia, at least in local places, may indeed be truly ancient considering such archaeological findings as the *Sunduki*, also called the Siberian Stonehenge, which is believed to be ancient and to have functioned as a type of astronomical observatory.[1] In general, the astronomical terms of the languages of far Northeastern Siberia are poorly documented. In fact, there is a severe lack of such lexical documentation (i.e. astronomical terminology) in Yukaghir, and Ewenki (and Ewen). This can be contrasted with the situation in Yakut, which has a considerably sized

[1] The mountain range of (*Gornaya gryada*) *Sunduki*, which comprises eight sandstone mounts, is located in the Ordzhonikidze and Shirinksky districts in the Republic of Khakassia. The word *sunduki* (Сундуки́) in Russian means *chests*, which describes the appearance of the mounts (Larichev; Gienko; Parshikov; Prokopyeva, 2016; Kukonen; Baklitskaya, 2013, as interviews with professor Vitaly Larichev of the Institute of Archaeology and Ethnography of the Siberian Branch of the Russian Academy of Sciences, and professor Alexander Leonidovich Zaika, Head of Archaeology and Ethnography Museum of Astafyev Krasnoyarsk State Pedagogical University). The area is littered with cave paintings, and at one location the summer solstice was perfectly marked 2000 BP. All this information of early suggested astronomical activities, and enormous age, should be contrasted with the 3500 BP when the first known sundials existed in Egypt.

speaker base[2] and an Internet presence,[3] and where astronomical terms are much better documented, albeit surprisingly difficult to find outside of Yakutia (and, for example, not included in the JRS), including the names of some star constellations, and planet names. The comparison of astronomical terminology in these unrelated languages (i.e. Mongolic, Yakut, Ewenki and Yukaghir) is illuminating about the originally relatively low state of ancient astronomical knowledge shared between these populations, which all were, after all, in relatively frequent contacts with each other. By comparing different groups of languages we may gain some insight into the creative processes through which astronomical terminology has been areally created.

In this paper, I intend to present both known and some less known astronomical terminology in these languages. While this paper may serve as a primer into the early knowledge of areal astronomy, I am hoping that the presentation may go much deeper with the inclusion of several comparisons, some of which have never to my knowledge been carried out before; the intent is thus to highlight the areal contacts, and therewith resulting lexical borrowings, as well as etymologizing the terminology of astronomy itself, not least the most creative sources of vocabulary through illustrative compounding processes. All of this is aimed at giving us a historical impression of astronomical knowledge and terms in times past.

The history of the knowledge of astronomy in the Northeast Siberian area

Let us begin by taking a step back into the far history of astronomy in the northeastern Siberian area. The area of interest in this study is those shared by Turkic, Mongolic, Tungusic and Yukaghir populations, and in particular we will study the Yakut, central Mongolians, Ewenki (& Ewen) and Kolyma and Tundra Yukaghirs to arrive at a representative picture of historical and astronomical knowledge among these specific populations. It is most difficult to describe the continuity of cultural astronomy within the context and terminology of Prehistory, Antiquity, Middle Ages, *etc*. because much of the areal history is not known for these stages.

However, the reconstructed forms for astronomical terminology in each respective language will allow us to quite specifically trace the minimum knowledge of each population at different chronological stages. The approximate age of each respective proto-language can be estimated,

[2] There are approximately 450 000 native Yakut-speakers according to the 2010 Russian Census.

[3] It is difficult to estimate when this presence was established, and I know of no research dealing with such. It seems to have started with Yakut newspapers and blog posts on various Russian sites a number of years ago. Blog posts can be found commonly already from 2015 at the latest. An example blog, dealing with Yakut history, politics, culture etc. and which is seemingly very active and popular is found at https://vk.com/eigevk , all in Yakut, with links to other blogs. Another popular Yakutian portal is Ykt.ru. The Yakut newspaper *Kyym* (kyym.ru), for example, was established in 1921 (!) and is currently found online also written in Yakut. Resources such as Facebook and WhatsApp are currently very popular among the 300 000 inhabitants of Yakutsk.

although these may vary, to Proto-Tungusic at least 1000 BP, Late Proto-Yukaghir (PY) at least 1000 BP, Proto-Mongolic c:a 800 BP, and Proto-Turkic c:a 2500 BP (Dybo, 2007). In other words, as we are able to reconstruct astronomical terms in the proto-languages having founded the modern Ewenki (& Ewen), Kolyma & Tundra Yukaghir and various Mongolic languages, we are able to pinpoint the *minimum* astronomical knowledge in the populations speaking these languages approximately 1000 years ago, that is in the Early Middle Ages, pinnacle of the Medieval times. In the case of Yakut, the native vocabulary has a much more ancient origin with Proto-Turkic going back several thousands of years[4] more to what was best termed Pre-Historic times. In the presentation, I have therefore been very careful to include any known reconstructed form, allowing us to date each term using the above guidelines.

Additionally, there are numerous Tibetan and Sanskrit borrowings to be found; Tibetan Mahayana Buddhism started in the 7th century CE, and it spread from Tibet throughout the Himalayan regions and to Mongolia, Central Asia, and several regions of modern Russia, such as, for example, to Buryatia (a part of the second Turkic Khanate), then to Tuva (a part of the Eastern Turkic Khanate), and later to regions of Kalmykia as part of the second Turkic Khanate, after it had temporarily been subjugated by the alliance of the Seyanto Clan and Tan Empire, until it was later conquered by the Khazar Khanate. Thus, the Tibetan borrowings have occurred at some point during this spread, likely a few hundreds of years after the 7th century CE, again in the Early Middle Ages. Furthermore, much of the Buddhist texts of certain schools of thought are written in Sanskrit (Eltschinger, 2017), and the Sanskrit borrowings found in the data presented below, will therefore also have come from the spreading Buddhism during that same era. Such vocabulary often pertains to the deities of Buddhism, being connected to various planets and the respective days of the week that they are tied into, or that are named after them.

[4] The author wishes to here avoid discussing the question of whether Turkic, Tungusic, Mongolic, Japanese and Korean all hail from a common source, i.e. the Macro-Altaic language hypothesis. This hypothesis is highly debated today, unlike the reliably established linkage amongst the Indo-European languages, where agreement in the basics of such studies go back already to the beginning of the 20th century. As for the Altaic language hypothesis many questions still remain, including the establishment of a believable timeline of historical and phonological developments. If one accepts the Altaic language hypothesis, which is not without merit considering relatively solid linguistic proof, then Proto-Altaic can be assumed to have split into a Western and an Eastern branch (as well as perhaps a separate Tungus-Manchu branch) perhaps already around the 6th millennia BC, probably around the territory of modern day north China (2003-EDAL, pp.234, 236). For those interested, further interest should be placed on Robbeets' controversial recent attempt to prove the hypothesis through population genetics and archeological findings, relying heavily on the lexicon of trans-Eurasian farmers (Robbeets, 2017).

In modern history, first contact with the Yakut was made only in the early 1600s,[5] and by the time of the Russian revolution of 1917, the Yakut language had already borrowed some 2797 words from Russian (Sleptsov, 1964, p.12), no doubt exchanging much of its native vocabulary in the process. The first known record of the Yukaghir languages was in the second half of the 17th century (2006-HDY, p.10). The Mongolic languages, then, have of course been fully documented from the time of the great Mongol Unification in the year 1206,[6] but older documents do exist in various sources in other languages, with the oldest known Mongolic "document" (actually of a para-Mongolic language) being the so-called Khüis Tolgoi inscriptions from the beginning of the 7th century (Vovin, 2018).[7]

In between 1785 and 1794 an expedition took place under the leadership of Commodore Joseph Billings, who had been the astronomer's assistant on James Cook's last voyage, and now under the command of Her Imperial Majesty Catherine the second. The story of the expedition was narrated through notes and papers collected by the secretary of the expedition Martin Sauer,[8] and published as a complete volume printed in London in 1802 (Sauer, 1802).

[5] In the 1620s, the Russian state moved into Yakut territory. The following subjection of the Yakut population to the Russian crown was not idyllic: pelt tax (*yasak*) was imposed, unfortunate outbreaks of smallpox happened about the same time, and subsequent rebellions were suppressed. The situation was eased during the 18th century with the granting of some privileges, lands, education, and the establishments of missions and, of course, the introduction of the railroad in the second half of the 20th century. Already in 1692, Dutch diplomat Nicolaas Witsen (1641-1717) published the volume "Noord en Oost Tartarye" (short title), describing Siberia, the Far East and Central Asia, and which contained word lists on more than 25 languages (including Samoyedic, Turkic, Tungusic and Yukaghir languages)! Several expeditions of the Russian Academy of Science, involving visits to Yakut, Tungusic and Yukaghir populations, were subsequently carried out: Second Kamchatkan Expedition (1733-1743), the North-Eastern Expedition of Joseph Billings (1785-1793; detailed in this paper), and the expedition of Ferdinand von Wrangel (1821-1824). Other materials of interest were collected by Dr. Pallas through correspondence (published in 1786 and 1789).

[6] Prior to 1206 there existed several different Mongolic dialects, as well as para-Mongolic languages (2005-ML, pp.391-402). However, with the Mongol Unification of 1206, after the victory of Chinggis Khan, intensive linguistic unification took place, and several of the at the time existing Mongolic dialects were lost, instead leveling out the differences with the general introduction of one dialect (2005-ML, p.3), which we now term Proto-Mongolic.

[7] The inscriptions at Khüis Tolgoi were studied in 2014 by a team consisting of Étienne de La Vaissière, Dieter Maue, Mehmet Ölmez and Alexander Vovin, along two experts of 3D photography led by Tobias Reich. The Mongolic language found there thus became the earliest attested Altaic language of the steppe.

[8] Martin Sauer was an English civil servant and explorer. He knew at least English, Russian, French and German, and was acquainted with both Dr. Peter Simon Pallas (a Prussian zoologist and botanist) and Mr. Billings (since the 1780s). At their behest, he joined the expedition as both secretary and interpreter with the promise of permission to publish his findings and remarks upon return. During the entire journey he made language notes (500 Yukaghir words were collected) and map sketches on small pieces of paper, and he kept an expedition journal for Billings. His maps were later compared to Shalauroff's charts, and Captain Billings' astronomical observations in the Icy Sea, which corrected the concurrent geographic view of Russia's Far East. He returned to St. Petersburg in March 1794 in a critical state of health due to rheumatism. Dramatically, the Russians, and Billings, searched Sauer's apartment for expedition materials to prevent him from publishing anything before Empress Catherine the Great would have liked. The exact activities and circumstances during this time are not known. However, Sauer sought a leave of absence from the Admiralty, and went to England where he published the first printed description of the expedition in 1802. Later, Sauer worked as a stockbroker

Most helpfully for our purposes, the expedition collected vocabulary from all the tribes that they encountered, including the Yukaghir (referred to as B by Nikolaeva in 2006-HDY), the Yakut and the Ewen. In these very early notes, we find Yakut *tangra* 'God' (Sauer, 1802, p.1 of App. 1), which is indeed the modern word for 'sky'; the word originates in Proto-Turkic and we may assume that the original root had meant both 'God' and 'sky'. In the same Appendix we have the following very interesting words (with minor transcriptional modifications) in the respective language: Yukaghir *jelónča* 'sun', Yakut *kuin*, Ewen *nultian*; Yukaghir *kininča* 'moon', Yakut *ooi*, Ewen *beɣ*; Yukaghir *leruŋundčia* 'stars'; Yakut *solus*, Ewen *ošikat*. These all still have their modern equivalents in the now spoken languages. The documented "Billings" Ewen word for 'sun' above, however, is actually only found in folklore (Chumikan dialect and the Urmian form of the Burenic-Urmian-Amgu dialect of Ewenki *ńulten, ńulter* in 1958-ERS, p.307).

Naturally, several constellations have been known and named by many populations already in pre-historic times. For example, in older times the Yakut knew the time of night by the position of the Great Bear and the Pole Star (Sauer, 1802, p.122), suggesting of course that they had words for both the *Great Bear* and the *Pole Star*. Older Yakut traditions have been documented elsewhere (Sauer, 1802, p.122):

"Of the approaching seasons they judge by the following phenomenon. If the Pleiades, which they call *oorgel*, appear before the moon when seven days old in the month of January, they expect spring to commence in the beginning of April; if when nine days old, at the end of April; but if this happens on the tenth day, they expect a late spring, and begin to be very saving of their fodder. They reckon distance by time; and 30 or 40 verfts, according to the goodness of the roads, make a day's journey."

In other words, astronomical observation was used by the very superstitious Yakuts to predict details about the seasons. This is naturally also true of many other populations around the planet.

Yakut astronomical terminology

Let's first dwell a bit on Yakut details, where some names are of old Turkic origins, and where the Лексика (1997-SIL, pp.50-66), being an excellent comparative Turkic source, summarizes the state-of-the-art etymologies well, as does the Yakut dictionary (1972-JRS).[9]

in the St. Petersburg exchange. Two other contemporary accounts were made of the expedition, one by Gavril Sarychev and another by Carl Heinrich Merck, but Sauer's is considered the fullest account, and, granted, it is an interesting, vivid and insightful read.

[9] The Лексика, published in 1997, is a major Turkic language comparative work with numerous notes on etymologies, suggested borrowings to or from Mongolic, as well as the available attested forms in most Turkic languages of different roots categorized in limited semantic groups; thus can be created very convincing Proto-

However, not even there are all known Yakut terms included or discussed, far from it. As collected from various disparate Internet sources,[10] as well as from the Лексика, and as Romanized translations of the modern Yakut transcription and parlance, the following terms as vernacular Yakut can be collected here (and etymologized where known): Yakut *kün* 'sun' (< Proto-Turkic ***kün** 'солнце = sun';[11] 1997-SIL, pp.64-65; Öztopçu; Abuov; Kambarov; Azemoun, 1999, p.147; 2003-EDAL, p.553); Yakut *mendeŋe* 'меркурий = Mercury'; Yakut *čolbon* 'Venus' (< Proto-Turkic ***čolpan** 'венера; звезда = Venus; star'; 1997-SIL, p.50, although this Yakut word could instead be a less likely Mongolic borrowing) or Yakut *kol* 'Venus < red star, morning star'; Yakut *sir* 'Earth' (< Proto-Turkic ***jęr** 'земля = Earth' (1969-VEWT, p.198; 1972-EDT, p.954; 1974/2000-ESTJ, vol. 4, pp.191-192; 1997-SIL, p.53));[12] Yakut *yj* 'moon' (< Proto-Turkic ***aj** 'луна, месяц = moon, month'; 1997-SIL, p.55; 1972-EDT, p.265; Öztopçu; Abuov; Kambarov; Azemoun, 1999, p.95; 2003-EDAL, p.303); Yakut *yjdyŋa* 'moonlight'; Yakut *xoro* 'Mars'[13] or Yakut *xatayn čolbono* 'Марс = Mars'; Yakut *sendeli* 'Юпитер = Jupiter' (which contrasts with Old Uyghur *juγać jyltyz* 'юпитер = Jupiter, lit. дерево-звезда = tree star'; 1997-SIL, p.66); Yakut *d'endeli* 'Сатурн = Saturn'; Yakut *kündül* 'Уран = Uranus' (for the etymology, see below); Yakut *xabaraan* 'Нептун = Neptune' (for the etymology, see below); Yakut *simik* 'Плутон = Pluto' (for the etymology, see below); Yakut *kün duolana* 'the Solar system'; Yakut *orgel* 'Pleiades' (< Proto-Turkic ***ürker** 'плеяды = Pleiades; 1997-SIL, pp.62-63, cf. Old Turkic *ülker* 'Pleaiades'); Yakut *ulaxan araŋas sulus* 'Ursa Major'; Yakut *aččygyj araŋas sulus* 'Ursa Minor'; Yakut *xallaan siige* 'млечный путь = the Milky Way, lit. небесный шов = heavenly seal' (1997-SIL, p.59, semantically cf. Tuvan *de:r ti*: 'Milky Way, lit. heavenly seal'); Yakut *xotugu sulus* 'the North Star, lit. северная

Turkic reconstructions. The JRS, published already in 1972, is instead an often referenced dictionary over the general vocabulary of all semantic classes of the Yakut language, a work of major importance.

[10] For example, native Yakut-speaker Eige, blogging at vk.com, presented, among other correct linguistic documents, a graph over the Solar System (the *Kün Duolana*) with all the names of the planets in standard, spoken Yakut (*Saxa tyla*). Web address [Retrieved 2020-03-30]: https://vk.com/eigevk?z=photo-91281403_384484412%2Falbum-91281403_221277715%2Frev . The confirmation of web sources are always required because they are less reliable than primary sources. However, available materials are very scarce indeed, and therefore web-folklore itself becomes an irreplaceable source of language activity (language practices, discourses, mentality, etc.) of the Yakut, and this presentation is therefore to be considered acceptable and sufficiently reliable.

[11] It has been claimed that Khalkha *gegee* 'light; dawn' is borrowed from Turkic (< Old Mongolian *gegeghen* < *geghen* 'bright' < ?Turkic *ge-. While the semantics may agree with this, there are quite gross phonological differences to overcome and explain – although reduplication would be an acceptable possibility (i.e. *gengen), which could explain the word for 'bright' well – but I will suggest that this is a tentative borrowing only.

[12] Contrary to Sandzheez (2016-ESM) "Proto-Mongolic" ***ǰerge** 'row, degree, rank' or "Proto-Mongolic" ***ǰerlig** 'wild; unbridled; rude' can have nothing to do with Proto-Turkic ***jer** 'Earth' due to unsurmountable semantic differences.

[13] The etymology is unclear because *xoro* otherwise means either 'trumpet' or 'to know something' in Yakut (1972-JRS, p.501).

звезда = north star' (1997-SIL, p.64) (< Proto-Turkic ***jul-duŕ** 'звезда = star' (2003-EDAL, pp.1155-1156; 1969-VEWT, p.210; 1963/1967-TMN, vol. 3, pp.260-261; 1972-EDT, pp.922-923; 1974/2000-ESTJ, vol. 4, pp.279-280, 1997-SIL, p.53 (presents ***jyltyz**); Yakut *kündeerkej sulus*, *ürüŋ sulus* 'the Sirius star' (not discussed in 1997-SIL, p.64); Yakut *kuturukta:x sulus* 'comet' (< Proto-Turkic ***qujruqluɣ jyltyz** 'комета = comet'; 1997-SIL, p.54); Yakut *taŋara*, *tayara* 'sky' (< Proto-Turkic ***teŋir** 'небо = sky'; 1997-SIL, p.59); Yakut *küök* 'sky' (< Proto-Turkic ***kök** 'небо = sky; blue; gray'; 1997-SIL, p.60)[14]; Yakut *kuyar* 'universe'.

I will suggest three Yakut etymologies here, which to the best of my knowledge are new ones, namely for the outermost planets 'Neptune', 'Uranus' and 'Pluto'. As for Yakut *xabaraan* 'Neptune' it should be identical to the Yakut adjective *xabaraan* 'резкий, крутой (о человеке, его характере); яростный страшный; необъезженный (о лошади); сердитый мороз, жестокий мороз; ломкий, хрупкий = sharp (about a person's character); furious, terrible; unbroken (about a horse); severe frost; brittle' (1972-JRS, p.471). Thus, the name for 'Neptune' is descriptive and best translated as 'the severely frosty one', which is fitting name considering that the planet is so distantly located from the sun, and very cold at the its cloud tops (ca. -218 °C). It is a blue gas giant, and in some mythologies connected to the sea, cf. Neptune 'the Roman god of the seas'. Further, I suggest the etymology of *kündül* 'Uranus' as being from Yakut folkloric expression *kündül xallaan* 'светлое небо = bright sky' (1972-JRS, p.197). Since the second part of the compound means 'sky', the name for 'Uranus' is literally translated as an adjective meaning 'the bright (one)'. 'Uranus' is another very cold gas giant, and with lower clouds of water and higher clouds of methane giving it a very light (blue) appearance. Furthermore, Yakut *simik* 'Pluto' seems to be identical to the adjective *simik* 'тусклый, слабый, бледный (напр. об огне); тихий, слабый = dull, weak, faint (for example of fire); quiet, weak' (1972-JRS, p.323). Indeed, this is a most apt description for 'Pluto'; it is 'the faint, quiet one' the furthest distance away from the Sun.

With this historical and comparative study, I do not know the etymologies for the Yakut words for Mercury, Mars, Jupiter, and Saturn based on previous scholarship. These are fairly different from the forms found in surrounding languages – and their phonologic, and perhaps also morphophonologic structures are different even compared to each. It stands to reason, since many of the outer planets were discovered only later on, that the Yakut words for them must be either borrowings (weaker possibility) or descriptive terms (stronger possibility) in the Yakut language.

[14] Interestingly, this Turkic root has a correspondence in Mongolic ***köke** 'blue', attested in Khalkha, Buryat, Kalmück, Baoan, Dagur, Dongxian, Monguor (Sandzheev et al. in 2016-ESM, pp.137-138). These forms suggest that this is a Turkic borrowing already into Proto-Mongolic, or even more likely earlier into Pre-Proto-Mongolic.

There are of course also more Turkic forms than the above, some of which are metaphorical, but these are not attested in Yakut, including Old Turkic *eren tü:z* 'Jupiter' (*oŋay* in 1972-EDT, p.191); *kara: kuş* 'Libra, lit. black bird (sometimes also meaning Jupiter)' (which contrasts with Old Uyghur *tarazuk, tirasuk, tirazuk*, Kazakh *tarazy* & Kyrgyz *taraza* 'весы = Libra'; 1997-SIL, p.52); *temür kazuk* 'the Pole star'; *bakır sokım* 'Mars, lit. copper whistle' (1972-EDT , p.923). There are also Old Uyghur *suw julduz* 'меркурий = Mercury', Kazakh *kiši šolpan* 'Mercury, lit. small Venus' (1997-SIL, p.57), and Old Turkic *sevit* 'Venus, lit. the one who causes love' (1972-EDT, p.785; 1997-SIL, p.51). It appears as if the original Turkic word for 'медведица большая = Ursa Major' may have been ***jetegen** (1997-SIL, pp.56-57) > Old Turkic *yeti:ge:n* 'Ursa major', *etc*., and the word for the constellation 'Scorpio' may have been ***ćajan** (1997-SIL, p.64). The etymology of the planet 'Venus' in Turkic has convincingly been discussed elsewhere (Şirin User, 2014).

Mongolic astronomical terminology

Mongolic astronomical terminology is, in general, vastly different to that of the Turkic languages, as is, seemingly what little is documented of Tungusic astronomical terminology.[15] In modern Mongolian, going back to terms from Middle Mongolian, the planet names are (with etymologies referenced when known) (гараг = planet): *nar* (нар) 'Sun' (< Proto-Mongolic ***naran** 'sun' (Nugteren, 2011, p.452; Sandzheev *et al*. in 2016-ESM, p.189)); *sar* (сар) 'Moon' (< Proto-Mongolic ***sara** 'moon; month' (Nugteren, 2011, p.483)); *delqij garig* (дэлхий гариг) 'Earth', *bud garig* (Буд гариг) 'Mercury' (< Sanskrit *budha* 'Mercury'); *sugar garag* (Сугар гараг) 'Venus', *aŋarag garag* (Ангараг гараг) 'Mars' (< Sanskrit); *barqasvad' garig* (Бархасвадь гариг) 'Jupiter';[16] *sančir garig* (Санчир гариг) 'Saturn'[17]; *uran* (Уран) 'Uranus'; *neptun* (Нептун) 'Neptune'; *pluton* (Плутон) 'Pluto'; *sarny gerel* (сарны гэрэл) 'moonlight'; *narny sistem* (нарны систем) 'Solar system'; *ursa qošuuč* (Урса хошууч) 'Ursa major'; *ursaagiji baga* (Урсаагийн бага) 'Ursa minor'; *süün zam* (Сүүн зам) 'the Milky

[15] Arduous as it is to elucidate the early development of cultural astronomy, our analysis does not concern itself with the so-called Altaic language theory (as has been discussed at length for example by such researchers as M. Robbeets, A. Dybo, A. Vovin, S.A. Starostin, A.M. Ramer, *etc*.). Rather, our comparative viewpoint deals with areal history, operating within the Uralic and Yukaghir families as well as the hypothetical Altaic macrofamily. However, the study of the latter family is limited in that this study does not deal with Korean and Japanese astronomical terms at all. In any event, it must be stated here that the strikingly different astronomical culture as found in Proto-Turkic, Proto-Mongolic and Proto-Tungusic is rather supportive of the anti-Altaicist outlook.

[16] The word is clearly borrowed from Sanskrit *bṛhaspati* 'Jupiter', cf. also Khalkha Mongolian *barhasvad' ~ barsvad'* 'Jupiter; Thursday' (etymologized by Sandzheev *et al*. in 2015-ESM, p.79).

[17] The etymology is unclear. However, Tibetan *spen ba* 'Saturn' is borrowed as Khalkha Mongolian *b'amba* 'Saturn', Buryat Mongolian *bimba* 'Saturn', and Kalmück *bemb* 'Saturn; Saturday' (etymologized in 2015-ESM, p.90).

Way';[18] *qojd od* (Хойд од) 'North Star';[19] *süülт od* (сүүлт од) 'comet';[20] *teŋer* (тэнгэр) 'sky'; *orčlon* (орчлон) 'universe'. The above may be compared to Written Mongolian *nara(n)* 'sun', *sara(n)* 'moon', *delekei* 'earth, universe' (Lessing, F.D. in 1960-MED, pp.565, 674, 248), *bud* 'Mercury; Wednesday (obs.)'[21], *čolbun ~ čolmun* 'Venus, morning star'[22] (1960-MED , pp.129, 197); *barxasabadi* 'Jupiter; Thursday (obs.)';[23] *tngri ~ tenggeri* 'heaven, sky; god; weather'; *orčilang* 'cycle of reincarnations or transmigration; material world' (1960-MED, pp.90, 809, 617). It is interesting to note that the days of the week in the old Mongolian calendar were named after the planets, similarly to what is found in many other languages.

In Khalkha Mongolian all the days of the week are borrowed instead primarily from Tibetan planet names: Khalkha *myagmar* 'Tuesday; Mars' (< Tibetan *mig dmar* 'Mars' (2016-ESM, p.170)); Khalkha *nyam* 'Sunday' (< Tibetan *nyima* 'sun'); Khalkha *baasan* 'Friday' (< Tibetan *pasang* 'Friday'); Khalkha *pürev* 'Thursday' (< Tibetan *phurbu* 'Jupiter'); Khalkha *davaa* 'Monday' (< Tibetan *zlaba* 'Moon'); Khalkha lahgva 'Wednesday' (< Tibetan lhag-pa 'Mercury'); Khalkha *byamba* 'Saturday' (< Tibetan *spenpa* 'Saturn' or, more likely, Sanskrit *bimba* 'Saturn'). The Khalkha Mongolian planet names are borrowed both from Sanskrit and Tibetan, cf. Khalkha Mongolian *barhasvad' ~ barsvad'* 'Jupiter; Thursday' (< Sanskrit *bṛhaspati* 'Jupiter') (etymologized in 2015-ESM, p.79); Khalkha Mongolian *davaa* 'луна = moon' (< Tibetan *zla ba* 'Moon') (etymologized in 2015-ESM, p.161). This has evidently resulted in the names of several weekdays and planets to have two synonymous names, one borrowed from Tibetan and the other from Sanskrit. Further, Khalkha *yertönts* 'world' could, in theory, be related to Turkish *yer* 'place' and Kyrgyz *zher* 'earth', but if so then the segmentation and morphological analysis of the Khalkha word is unclear resulting in an opaque

[18] While the word for *the Pleiades* is borrowed as Khalkha Mongolian *mičid* and Buryat *mičin* 'star' seemingly from Oyrat *mečin* (Sandzheev *et al*. in 2015-ESM , p.169).

[19] In Khalkha Mongolian we have *altan gadas* 'Pole Star' (2016-ESM, p.15), which literally means 'gold stick'.

[20] Probably comparable to Written Mongolian *sülde odun* 'name of a star of ill omen; the first star in Ursa Major' (1960-MED, p.743), cf. *odun* 'star'.

[21] Borrowed from Sanskrit *Budha* 'Mercury'. It is also found in Khalkha Mongolian *bud* 'среда; Меркурий = Wednesday; Mercury', as noted by Sandzheev *et al*. 2015:107. Interestingly, there is also Khalkha Mongolian *lhagba* 'Wednesday; Mercury' instead borrowed from Tibetan *lhag-pa* 'Mercury' (etymologized in 2016-ESM, p.155). In light of many other Sanskrit and Tibetan borrowings into Mongolic due to Buddhism, these borrowings should not be very surprising.

[22] Cf. Khalkha Mongolian *tsolmon* 'Venus'.

[23] Borrowed from Sanskrit *Bṛhaspati* 'Jupiter'. Other Sanskrit planet names of interest are *Surya, Ravi, Aaditya, Arka, Bhanu, Savitr, Pushan, Ravi, Martanda, Mitra, Bhaskara, Vivasvan* 'Sun', *Chandra, Soma* 'Moon', *Prithvi* 'Earth', *Shukra* 'Venus; clear, bright', *Maṅgala, Lohit* 'Mars', *Guru* 'Jupiter', *Shani, Shanaishcara* 'Saturn', *Indra, Vasava, Sakra, Aruna* 'Uranus', *Varuna* 'Neptune', *Yama* 'Pluto'. Several of the planets have several names because some are descriptive terms while others are names of the deity/deities signifying the planet.

etymology. Furthermore, Khalkha *ogturguy* ‘heaven’ (finding a correspondence in Old Mongolian *ogtarguy* ‘heaven’ is etymologically unclear to me.

In Dagur, the terms are: Dagur *nar* (нар) ‘sun’ (G. Tumurdej and B. Tsybenov in 2014-KDRS, p.122); *sar* (сар) ‘moon; month’ (2014-KDRS, p.140); *gažir žečin* (гажир жэчин) ‘планета Земля = Earth’ (2014-KDRS, p.37); *čolbun* (Чолпун) ‘Venus; morning star’ (2014-KDRS, p.207). Actual Mongolic Proto-forms can naturally be reconstructed for a number of astronomical terms by the use of collections of lexicon from all the branches of the Mongolic languages just like, for example, Hans Nugteren (Nugteren, 2011) convincingly did in his thesis work. Previously, in addition to roots for ‘sun’ and ‘moon’ (above), at least the name for the planet ‘Venus’ has been constructed as Proto-Mongolic ***čolbun** ‘Venus’ (1990-MGCD, p.575), which is very close to Proto-Turkic ***čolpan** ‘Venus’ (1997-SIL, p.50-51). The proto-Turkic form has been segmented as *čolp-y-ɣan > *čolpan, an imitative word, with a verbal suffix, and with a communion suffix. If this hypothesis is correct, then the Proto-Mongolic form would appear to be a Turkic borrowing despite the small phonological differences. Of course, we should not ignore the possibility that the Turkic and Mongolic words could go back independently to a much earlier common etymon, in which case the proto-forms are perhaps etymologically quite opaque.

Ewenki astronomical terminology

On the Tungusic side, we have the basic terminology of: Ewenki *beeva* ~ *beega* ‘moon; month’ (G. Vasilevič in 1958-ERS, p.52); *manawu* ‘decline of the moon’ (1958-ERS, p.609); *sivun* ~ *xigun* ~ *xivun* ‘sun’ (1958-ERS, pp.537, 477, 475), which is the native Tungusic form. Also, I note, in most dialects of Ewenki there is *dɨlačā* ~ *delačā* ~ *deličā* ‘sun’ (A. Romanova and A. Myreeva in 1968-DEJ, p.42; 1958-ERS, p.134) (as well as Negidal *dilača* ‘sun’ (1975/1977- TMS, vol. 1, p.206)), which would appear to be another Mongolic borrowing, cf. Khalkha *tüleh* ‘fire’.

Then, Ewenki *čolbon* ~ *soldon*, *tymanī typkēnin* ‘Венера = Venus’ (1968-DEJ, p.201; Boldyrev, B.V. in 1994-RES, p.36; Vasilevič, G.M. in 2005-RES, vol. 1, p.44) is interesting, because the former is again a Mongolic borrowing, while the latter is a compound literally meaning *to drive in the east*. Likewise, Ewenki *čalbaka* ‘half moon, crescent’ must also etymologically originate in the same former borrowing source (and it is not at all justified to reconstruct Proto-Tungusic ***čalbaka** merely based on this borrowed item as per 1975/1977-TMS, vol. 2, p.380).

Also, Ewenki *kulānde* ~ *xulānde*, *xōlban* ‘Марс = Mars’ (1994-RES, p.189; 2005-RES, p.221); the latter form is a phonetic variant of the Mongolic root, probably a chronologically separate borrowing, which has gained the meaning of ‘Mars’ instead of ‘Venus’, just as it has

in some other mentioned languages. Further, this is shown by that Romanova and Myreeva note in the above citation that the word *čolbon* also means 'Mars' in some Ewenki dialects. The former word, *xulānde*, then appears to be a suffixed variant of Yakut *kol* 'Venus' (above). Thus, the words for 'Venus' and 'Mars' – both regularly clearly visible in the heavens and resembling very bright stars – are borrowings in Ewenki. The 'Earth' in Ewenki is *dṻnne* ~ *dṻnde* 'земля' (1968-DEJ, p.45), while the 'Sun' is *siɣūn* (found throughout most of the Tungusic languages as originating from Proto-Tungusic ***sigū-n** 'солнце = sun' (1968-DEJ, p.137; V. Tsintsius in 1975/1977-TMS, vol. 2, p.78)). A 'star' in Ewenki is *ōsikta* ~ *ōsikākta* – the ending suggesting it to be natively Tungusic (A. Romanova and A. Myreeva in 1968-DEJ, p.131), and albeit the evidence for this is weak, the underived root could have been borrowed from Mongolic, cf. Proto-Mongolic ***od** 'star'. The 'North Star' is *buga saŋārin* (2005-RES, p.158). Further, there is dialectal Ewenki *jṻlten* 'sun' (1968-DEJ, p.71), which one must note has a phonologically striking similarity with Proto-Turkic ***jıl** 'year', and could be a possible borrowing.

Yukaghir astronomical terminology

Basic astronomical terminology in Yukaghir[24] includes, in addition to the words for 'sun' and 'moon' described above: KY *jel'o:d'ə* 'sun',[25] KY *jurgud'e:jə, jurgud'ejjə* 'star; awl',[26] TY *paɣad'iid-iečii* 'star', *paɣad'iid-ekuu* 'star, lit. drilled hole',[27] KY *pod'erqəčil-jurgud'e:jə* 'North Star, lit. white star', TY *čajlen-begieče* 'North Star, lit. stealing the day', KY *čomo:d'ə-jurgud'e:jə* 'North Star, lit. Big star'. The names of some constellations are: KY *monoɣəd-ajbi*: 'name of a star' ~ SD *monogol-ajbi* 'the constellation of the Great Bear, lit. mouflon shadow', KY *orpənd'a*: 'the constellation of the Great Bear',[28] TY *quo-raal* 'the constellation of the Great Bear',[29] TY *öjege-laqil* 'name of a star, lit. hare's tail'; TD *oiyedediye-* 'the constellation Pleiades'. Additional imaginative variants are found with KD *emin-pu:gu* 'moon, lit. night sun' and MC *pugul-mut* 'moon, lit. sun tree?'. We may note that in typical Yukaghir fashion, quite distinct meanings are created using semantically peculiar compounds.

[24] Kolyma Yukaghir = KY, with the "subdialects" SD and KD; Tundra Yukaghir TY, with dialectal materials TD.

[25] This word is seemingly etymologically related to KY *je:l'ə-* 'to boil up (INTR)', and just as I. Nikolaeva (2006-HDY, p.187) suggests the word for 'sun' may stem from an active participle of an attested passive verb ***jel'o**:- 'being boiled'. This root may also be cognate with Proto-Uralic ***jelä** 'light; Sun; day', Rédei, K. in 1991-UEW, p.96-97.

[26] Which originates etymologically in *jurgu*: 'slot, hole', that is, a 'star' is considered a hole in the tapestry of the heavens.

[27] The Yukaghir root for 'star' may actually be borrowed from Tungusic ***pugu** 'star' (1975/1977-TMS, vol. 2, p.43), as suggested in Nikolaeva (2006-HDY, p.340).

[28] This word is etymologically a derivative of KY *orpo:-* 'to hang up'.

[29] This compound is etymologically unclear, although the second part *–raal* at least means 'wood, tree; stick'.

Now, to the best of my knowledge, none of the above Turkic, Mongolic, Tungusic or beyond terminology, except for 'Venus', have been borrowed into Yukaghir (see below), although this is uncertain because many of these words have not been documented at all in the Yukaghir languages and dialects, and at this point in time my own Yukaghir informants have not been able to provide said native words, if any, either. Interestingly, the Yakut call the 'northern lights' *dykeebil wat*, which literally means 'Yukaghir fire'; perhaps this meaning has arisen as the northern lights observed by the early Yakut were in the geographic northern direction (and above) of a known Yukaghir tribe? In Yukaghir, the basic word for *moon* (and *month*) can be reconstructed as ***kininćə** (2006-HDY), which should not be cognate with Proto-Uralic ***kuŋe** 'moon' due to phonetic differences unless one assumes irregular development from an early suffixed form ***kuŋe-nćə**. Instead, the Yukaghir root has been suggested a Northern Nivkh borrowing[30] (< Proto-Nivkh ***kheŋ**- 'sun' (Nikolaev, S.L. in Nikolaev, 2015, p.43), but this too should be considered uncertain and the suggestion offers no advantages over assumed Uralic cognancy, and the Nivkh form is actually of the "opposite" semantic meaning. Likewise, one of the Yukaghir forms for 'sun' (there are a few) is represented by KY *jel'o:d'ə* 'sun', and similar forms in numerous other dialects (Nikolaeva, I., 2006-HDY, p.187), and which appears to have a possible connection with the KY verb *je:l'ə*- 'to boil up (INTR)'. Even this word for 'sun' has been suggested a Northern Nivkh borrowing, cf. Proto-Nivkh ***loŋ**- 'moon' (Nikolaev, 2015, p.41),[31] but a more likely origin to me seems to assume it cognate with Proto-Uralic ***jelä** 'light; sun, day' (1991-UEW, pp.96-97), a lexical correspondence which has been noted many times already in the literature (2006-HDY, p.187; Rédei, 1999, p.36, *etc*.); after all *–ńčə (> KY *–d'ə*) is a common nominal suffix in Yukaghir (2006-HDY, p.80). Evaluating some of these borrowing suggestions is extremely difficult, and they should therefore remain tentative suggestions for now.

In addition to the above extremely speculative terms, a newly discovered fairly secure borrowing can be suggested into Yukaghir with this paper: Proto-Mongolic ***čolbun** 'Venus' (2003-EDAL, p.1324) > Written Mongolian *čolmun ~ čolman ~ čolbun* 'morning star; Venus'

[30] Northern Nivkh is a hypothetical now extinct language responsible for believed lexical borrowings into Yukaghir, Chukchi, Northern Tungusic and the Siberian Eskimo Languages. As far as I can tell, the theory originated in the work of Prof. Oleg Mudrak, and his non-published comparative database. This database, which I have had the opportunity to study, and which is to be considered a work in progress, compares numerous northeast Siberian language, includes borrowings suggestions (including Nivkh in Yukaghir ones) and even newly reconstructed Proto-Nivkh, Proto-Yukaghir *etc*. proto-forms. Sergei Nikolaev (Nikolaev, 2015) briefly discusses the concept as well.

[31] With these borrowing suggestions, Nikolaev appears to assume the semantic swaps of 'sun' > 'moon' and 'moon' > 'sun', which actually is possible, cf. the semantics of Proto-Algic ***k-eɣ-ečh**- 'sun; moon'. Whereas I do not believe the Yukaghir word for 'sun' to be from Nikvh, the Nivkh word is correctly suggested the likely origin of Ewenki *loŋǯama* 'sickle moon' (Nikolaev, 2015, p.41).

(1960-MED, p.197) (and Dagur *čolpun* ‘Venus; morning star’ (G. Tumurdej and B. Tsybenov in 2014-KDRS, p.207)), *etc.* > Yakut *čolbon* ‘Венера; звезда = Venus; star’ (1972-JRS, p.511) OR Ewenki *soldon* ‘Венера = Venus’ (Vasilevič in 1958-ERS, p.361) or *čalban*, *čalbon* ‘Venus’ (1958-ERS, p.514) or *čolbon* ‘Венера; марс; красная звезда = Venus; Mars; red star’ (1958-ERS, p.524) > KJ *šoɣod’iebo* (< *soɣon- ~ *soŋqən-) ‘Venus’ (2006-HDY, p.409). This isolated, dialectal Yukaghir name for the planet ‘Venus’ is a doubtless borrowing either from Yakut or Ewenki, and in both of these languages it should be Mongolic borrowing. However, the phonological correspondence is irregular even between these two, as it is also to Yukaghir; the vocalism and sibilant/affricate may be identical in most of these languages, while the second syllable cluster has changed haphazardly in several of the languages and dialects from the Mongolic original *-lb-*, and on the Turkic side the *-l-* was often also lost (Şirin User, 2014). The reason for this could be that the name for ‘Venus’ is a folkloric borrowing, and that the word may therefore have taken on some of the typical properties of a *Wanderwort,* including irregular phonetic changes. However, Clauson (1972-EDT, p.418) gives Turkic *çolpan* ’Venus’ (from the fourteenth century), with similarities noted in several other languages, including Mongolic ones, and he therein also notes the irregular phonetic changes found in some forms; perhaps there were originally a few very similar words for ‘Venus’ spreading throughout the languages. Şirin User, H. (Şirin User, 2014) further notes that the same word for ‘Venus’ (*čolpan) is found in Turkic, Mongolic, Proto-Bulgarian, and Slavic, and as seen above, also in Tungusic and Yukaghir. Here we may also add modern Turkish *Çoban yıldızı* ‘Venus, lodestar’ – which has been folk etymologized into meaning ‘shephard’s star’ (merely because the day of a shephard’s work began as Venus rose on the horizon). It should therewith be clear that also the planet ‘Venus’ was both observable (of course) and named by the ancient Turkic tribes (a name that is mirrored in Mongolic), as was the planet ‘Mars’. This latter, however, has been subject to the creation of innovative names in most Turkic languages, a process that has lexically exchanged the original form, thereby lost. On the Yukaghir side, the ending of *šoɣod’iebo* could perhaps be phonologically segmented as *–d’ie-* (< *-(ń)ćeː-) & *-bo-* (< *-mpəW-, assumed with prosodic shortening of the formed *-o*ː-), although this suffixation pattern is unclear and finds no complete morphological parallel in any other Yukaghir word; therefore the word is likely instead borrowed in phonologically irregular opaque form withstanding Yukaghir morphological analysis.

Ewenki also has other names for ‘Venus’ such as the descriptive *tymanī typkēnin* ‘Venus, lit. morning wedge’ and *tyrgaldȳvūn* ‘Venus’, which must to be a native Tungusic construction. The Ewenki word *čolbon* above, however, is indeed borrowed, and may have originated through Yakut as intermediary language, with its ultimate etymological origin, however (as

noted in 1958-ERS, p.524, which also notes the Yakut form), being Mongolic, cf. *čolbun* ‘утренняя звезда = morning star’. In Ewenki, the word has different meanings in different dialects, including ‘Venus’, ‘Mars’ and ‘red star’, and if Ewenki is the source of borrowing into Yukaghir[32] it must have been from a dialect where the meaning was ‘Venus’, and the meaning of ‘Mars’ is no doubt a secondary semantic development. ‘morning star’ is another name for ‘Lucifer’ in Christian lore. Indeed, ‘Lucifer’ is not only the name of the fallen Archangel that became Satan the Adversary, but also the pre-Christian Roman mythological name for the planet ‘Venus’. In modern parlance, in several languages, ‘morning star’, ‘Venus’ and ‘Lucifer’ are perfectly synonymous, and I conjecture that the word for ‘Venus’ could quite likely have the meaning of ‘Lucifer’ also in the modern Christian Yakut society, but this remains unverified. Indeed it has this extra meaning in some other Turkic languages exactly because Venus is believed to be the male fallen angel of Lucifer (Bazin, 1963, p.575). Quite likely there are several borrowings of astronomical terms in Yukaghir (which might also be somewhat aberrant in phonology), but sadly these cannot be evaluated properly, as has been noted, due to a severe lack of lexical documentation. Most likely, however, is that the modern speakers of Yukaghir are using the Russian, or alternatively the Yakut, words for the various planets and constellations when needed, but again this remains unverified.

Conclusions

Astronomical terms seem to have developed quite independently in all of the Micro-Altaic languages, which could suggest that, in general, such terms are quite late developments in all of these languages (with the exception of *sun*, *moon*, and *star*, of course, as well as some constellations). This is evidenced by the wildly different Mongolic, Yakut, and Ewenki (and Yukaghir) terminology.[33] A conclusion would be that the involved tribes have for some parts kept the original naming conventions of their rudimentary, ancient world views and observations including names from cosmogenesis, astronomy, and celestial objects (and

[32] The direction of lexical borrowing must be into Yukaghir because we can clearly trace the Ewenki word back to Mongolic. Further, numerous Ewenki (and Ewen) borrowings both into early Yukaghir and later dialects are known, but in the other direction Yukaghir borrowings have only reached Ewenki (and Ewen) dialects, and have limited geographic spread. Very often, lexical forms are found shared between Ewen, Ewenki, Yakut and Yukaghir, and sometimes only between these languages. While such words can sometimes be traced back etymologically to a Proto-Turkic or Proto-Tungusic or even Proto-Mongolic origin, sometimes it would appear that the words may have originated in earlier now extinct but assimilated unknown local languages.

[33] Terminological evidence involuntarily falls into the argument, debated between adherents of the Altaic hypothesis, to support those who think that Mongolic, Turkic, and Tungusic as separate linguistic entities linked together by areal history rather than as genetically affiliated languages. Clearly, the early Mongolic, Turkic and Tungusic tribes did not share their rudimentary astronomical conventions and notions. Still, the historical and cultural connection referred to as the Turko-Mongolic language is by no means disproven. The comparative and macrocomparative perspective that we have applied, and the items reconstructed, shed light on the relation of the Uralo-Yukaghir and Altaic languages, and this provides a good stepping stone towards further future research.

mythology), but all populations have supplemented their terminology of astronomy through lexical borrowings (including commonly words for 'Venus' and 'Mars'), in a few cases quite extensively, such as in Khalkha Mongolian which borrowed all the names of the weekdays from Tibetan. The names of the later discovered planets are either innovative creations or borrowings from major surrounding languages, including what appears to be quite highly advanced astronomical vocabulary from Tibetan and Sanskrit. Some terms have taken on the character of a Wanderwort.

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