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# SIBERIAN LANGUAGES IN CONTACT, 2: THE NONAL COUNTING SYSTEM IN SIBERIA AND RUSSIAN *DEVJANOSTO* '90'

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Preliminary notes: (1) The terms *septenary system* and *nonary system* are used in mathematics to denote positional notations, i.e. special writing systems. What is important for us here, however, is a system in which the number seven/nine has a special function, i.e. it denotes a whole that consists of seven/nine pieces. The units can of course be noted in very different ways, as for instance: the number nine is 9 in the decimal system, 10 in the nonary one and 12 in the septenary one, and so on. For this reason I use terms in *-mal* or *-nal* (like *septimal*, *octonal*, *nonal system*) as names for *counting* systems whose common (derivational) denominator is that the number expressed in the adjective denotes the number of pieces building up a whole, a set or a unit. Incidentally, the term *decimal system* can be used for both writing and counting systems, whereas its mathematical synonym *denary system* is exclusively used for writing system. – (2) Every part of this series of articles is an independent study; however, always devoted to Siberian areal linguistics. Part 1 is Stachowski M. 2011.

1.

In the early 20th century, G. J. Ramstedt mentioned in one of his studies the fact that the Mongols consider the number 9 to be a special official unit (Ramstedt 1907: 18: "eine besondere offizielle Einheit") used when counting taxes and the amount of fines and also that, among Turkic peoples, the Kirghiz at least use the numeral *toguz* '9' as a noun as well with the meaning 'a present consisting of nine items, such as cattle' (*ibidem*). From that time on, these facts have frequently been cited and often regarded as applying to the Turkic or Altaic languages in general. The situation in Kirghiz, however, is somewhat peculiar:

[1.1] Indeed, the numeral *toguz* '9' does mean a whole; however, exclusively with reference to gifts, donations, and so on. The expression Kirgh. *kan tartūsu – toguz* 'a gift for a khan is a «nine»' (Judachin

1985 s.v. *toguz*) is used to say that it ill befits to present a khan with something incomplete (just as it is not right in Europe to bring an opened box of chocolates even when visiting one's mother-in-law). In other words, Kirghiz *toguz* '9' means also 'a whole, a set'.

[1.2] Kirghiz *üč* '3' (which is a general Turkic sense of this word) means '5' in children's games and in dice games. Originally, three elements (that is, e.g., three dice or three throws) must have made up a whole (i.e. an *üč* '3' and 'a whole' in Kirghiz). In the course of time some rules of some games will have presumably changed in such a way that a whole came to consist of five elements; nevertheless, it continued to be called *üč*. While summing up points in a game the participants use a syntagm consisting of *üč* with the 3rd person singular possessive suffix *-ü*, preceded by a multiplicative numeral (*-dī* ~ *-nī* ~ *-lī*), as in: *birdī üčü* '5', lit. 'once (*bir* 'one' + *-dī* 'time(s)') a whole (*üč*) of it (*-ü*)'. And analogically: *birdī üčü bir* '6', *birdī üčü eki* '7', *ekinī üčü* '10' (= *eki-nī* '2x' + *üč-ü* 'its whole'), *ekinī üčü tört* '14', *beštī üčü* '25' (= *beš-tī* '5x' + *üč-ü* 'its whole'), and so on (Judachin 1985 s.v. *üč*).

The numeral *üč* '3' does not work this way in any other Turkic language. For '9', however, some parallels can be found, for instance in Turkish. The Proto-Turkic form of Tksh. *dokuz* '9' can be reconstructed as **tokgyz* which can, in its turn, be derived in a spirit of zetacism from a Pre-Turkic[1] reconstruct **tokgyŕ*. According to Helimski's (1986: 47) rule: PreTkc. **ŕ*/_*C* > PTkc. **r*, otherwise > PTkc. **z*. This means in our case that PreTkc. **tokgyŕ* > PTkc. **tokgyz*, but PreTkc. **tokgyŕ*+*C* > PTkc. **tokgyrC*, as observed in Tksh. *dokurcun* ~ *tokurcun* ~ *tokurcuk* '1. a hay or corn stack of nine sheaves; 2. Nine Men's Morris (a board game played with nine counters)' < PTkc. **tokgyr*+*čyn* < PreTkc. **tokgyŕ*+*čyn* (Tekin 1969: 65; Helimski 1986: 44; Eren 1999: 117). As for the sound changes cf. also GTkc. *boz* 'grey' vs. Chag. *borčyn* 'grey duck', *borbaš* 'grey shrike' (Tekin 1969: 59; Helimski 1986: 43); Kirgh. *tygyz* 'solid, firm, thick' vs. Kirgh. *tygyrčyk* 'of short stature, short and thickset, stocky (of human beings and animals)' (Tekin 1969: 64; Helimski 1986: 44). Because of the [-rž-] cluster (= ‹-rc-› in modern Turkish orthography) this derivative must have come into being somewhere in the transitional period between Pre- and Proto-Turkic. We cannot of course say what its meaning in those times was. On the other hand, at the time when the word

[1] Pre-Turkic, as I use it here, refers to an evolutionary phase preceding Proto-Turkic. It can be understood as either "Early Proto-Turkic" or "Proto-Mongolian-Turkic" or "Proto-Altaic". The term "Pre-Turkic" denotes any period earlier than Proto-Turkic.

received its meaning 'Nine Men's Morris' its connection with nine must still have been perceived.

An etymological-phonological excursus:

In his study devoted exactly to the game *dokurcun*, Yüce first says (1977: 257) that this word consists of the suffix *+ǯun* (< Mo. *+lǯin*), preceded by *dokur* < **tokur* 'nine' (which of course corresponds to Tksh. *dokuz* id.). Then, he proposes two imaginable etymologies (both: ibidem 258):

[a] After the *z* > *r* change was completed, he says, this word – consisting of Tkc. **tokur* and Mo. **+lǯin* – was coined in an area where Turks and Mongols were living in close connection to each other;

[b] The *-rǯ-* cluster comes from **-zǯ-* (i.e., obviously, Tksh. *dokurcun* < **dokuzcun*) because "[d]ie Aussprache eines *z* vor einem *c* [= *ǯ*], *z*, *š* u.ä. ist schwerer als ein *r* vor denselben Konsonanten" (ibidem). – It comes as something of a surprise to see that the latter explanation was accepted in Schönig 2000: 120 (s.v. *+ǰUn*).

Not only does one have great problems in explaining why Yüce mentions *-zz-* and *-zš-* clusters that do not occur in this word at all, as well as why *-rǯ-* is easier to pronounce than *-zǯ-*; we have dozens of Turkish words with *-zǯ-* in which no such change ever occurred, e.g. *sözcük* 'word', *yıldızcık* 'little star', *birazcık* 'a little bit', *Oğuzca* 'the Oguz language(s)', *Fransızca* 'the French language', *İngilizce* 'the English language', *arsızca* 'impertinently', *sizce* 'according to you', *düzce* 'simply', *sessizce* 'silently, quietly', *umutsuzca* 'hopelessly', *yalnızca* 'solely', *yaldızcı* 'gilder', *sazcı* 'lute player', *kızcağız* 'poor/unfortunate girl', and so on – I do not think I have ever heard about any Turk having problems with the pronunciation of these words.

Furthermore, Yüce first gives the form **tokur* with an asterisk, but then he suggests a *z* > *r* change (i.e. *tokuz* > **tokur* – ?). This can only be interpreted as a chaotic device to avoid any zetacism (**tokúr* > *tokuz* ~ *dokuz*) because of its pro-Altaistic character.

Additionally, if one accepts the rhotacism (**z* > *r*) one has to remember that this change only was (as distinguished from zetacism) limited to Bulgarian.

Finally (and as a matter of fact, most importantly), Chag. *borbaš* 'grey strike', as adduced above, cannot be possibly explained as a *-zǯ-* > *-rǯ-* change, simply because it has no *-ǯ-* at all. This is not the only example of this sort. Two other derivatives of *boz* 'grey' are Kzk. *bozdak (tüö)* 'grey (camel)' vs. Tksh. dialectal *bortak* 'kind of wild duck' (Tekin 1969: 59). Cf. also other instances: GTkc. *taz* 'bald' vs. Kzk. *tarbaka* 'frog, toad' (ibidem 63); GTkc. *bogaz* 'throat' vs. Bshk. *bogarδak* 'windpipe, trachea'

(ibidem); GTkc. *kyz* 'girl' vs. Middle Tkc., Chag. *kyrkyn* 'female slave' (ibidem 62).

In short: no better etymological and phonetical explanation of Tksh. *dokurcun* has ever been proposed than that suggested by Tekin (1969) and accepted by Helimski (1986).

Revenons à nos moutons.

Another fairly important (even if rather wordy) study in our context is that by J.-P. Roux (1965) – one that unfortunately has remained for the greater part unnoticed in Siberian, Altaic and Uralic linguistic studies. Its importance consists in changing the explanatory perspective (see below), rather than in a separate explanation.

L. Honti (1990) refers to G. J. Ramstedt's 1907 study but he fails to mention J.-P. Roux. Nevertheless, Honti managed to explain Samoyedic data in a most ingenious and convincing way. The content of this article and the arguments presented therein are to a great extent repeated in Honti's 1993 monograph. Both studies suggest another direction of explanatory thinking, and they concern not only Samoyedic. On the other hand, Honti light-heartedly extends Ramstedt's Mongolian and Kirghiz examples straight to the Altaic languages in general.

All these discussions are sometimes separated from and sometimes interwoven with the discussion of the etymology of Russian *devjanosto* '90'. In the Siberian context, a paper by E. P. Hamp (1975) should be especially discussed because its author tries to connect this etymology with a rather original Old Turkic counting system.

Hereinafter, three aspects of the problem are dealt with:

[1.3] a commercial and arithmetical one (Ramstedt 1907; Honti 1990, 1993);

[1.4] an astronomical one (Roux 1965);

[1.5] a Slavistic one (Hamp 1975).

## 2.

As was mentioned above, Ramstedt (1907) gave one Mongol and one Kirghiz example of the nonal counting system. Furthermore, he adduced two Yurak words (here cited in Honti 1990 transcription): Yur. *xāsawaju$^{?}$* '9', lit. 'Samoyedic/Yurak ten' (< *xāsawa* 'Samoyed; Yurak' + *ju$^{?}$* '10') and Yur. *lūcaju$^{?}$* '10', lit. 'Russian ten' (< *lūca* 'Russian'[1] + *ju$^{?}$* '10').

[1] On the etymological identity of the General Siberian word *lūca* ~ *nūčča*, and the like, 'Russian' and Rus. *ruś* see Janhunen 1997: 160sq.

Ramstedt's (1907: 18) conjecture:

"Es sieht aus, als könnte sam. **ju$^{?}$* ['10'] aus derselben quelle stammen wie mo. *jisün* ['9']."

was unequivocally wrong and this unhappy idea of his was never followed up by his successors. Which, however, means that the Yurak expressions remained unexplained till Honti 1990 who presented two suggestions:

[2.1] In most Uralic languages '9' is expressed subtractively ('ten without one', or rather with a postposition 'without' or a caritive/abessive/privative suffix: 'one-without ten').[1] For that reason, one might interpret Yur. *xāsawaju$^{?}$* as a compound of *ju$^{?}$* '10' with an attribute that originally meant *'one-without' but it sank into oblivion over time and therefore was folk-etymologically distorted into *xāsawa* 'Samoyed, Yurak' (Honti 1990: 75). – It is rather hard to take such an explanation seriously. Even Honti was himself not in a position to say what word this attribute was and in what language.

[2.2] As witnessed by Ph. J. Strahlenberg in 1730, Yuraks used to bind nine (squirrel or other) skins into a bundle:

"Denn wenn solche [= the Yuraks] ihren Tribut überliefern, binden sie ihre Bündlein Hermelins, Eichhörner und Pelzereyen in 9. Stücke. Die Rußen aber, welchen diese neundte Zahl nicht so angenehm ist, binden diese Bündlein um, wenn sie solche in Empfang nehmen, und machen 10. Stück daraus" (Strahlenberg 1730: 78).[2]

This led Honti to a very interesting solution. He suggested that two different Yurak words were confused here. Originally, the compounds were built with Yur. *ju* 'bundle': **xāsawa ju* '9', lit. 'Samoyed/Yurak bundle' and **lūca ju* '10', lit. 'Russian bundle'. As time drew on, however, **lūca ju* was associated with the numeral *ju$^{?}$* '10' because a Russian bundle

[1] This method, common in the Uralic languages, has also influenced the Yeniseic linguistic family (or was it a device, independently developed in Uralic and Yeniseic?), cf. e.g. Kott. (18$^{th}$ c.) *hučabunága* '9', lit. 'one-without ten' < *huča* '1' + *-pun* 'without (caritive)' + *hága* '10' (Werner 2005: 99, 96); Assan. *godži-bun-ágiaŋ* '9', *hudže-šibuni-intukn* '19', lit. 'one-without twenty (*intukn*)' (ibidem 131); Arin. *qusa-man-čan* '9' (ibidem 153); Pump. *xúta-xamóssa-xaíaŋ* '9' (ibidem 178). In Ketish also: 18 = 'two-without twenty', 19 = 'one-without twenty', 28 = 'two-without thirty', 29 = 'one-without thirty', and similarly: 80 = 'twenty-without hundred', 90 = 'ten-without hundred', 800 = 'two-hundred-without ten-times-hundred', 900 = 'hundred-without ten-times-hundred' (Werner 2006: 178).

[2] Strahlenberg uses a point after a number to signal a cardinal numeral, not ordinal.

consisted of ten skins, and this resulted in the emergence of a hybrid compound *lūca ju*ˀ. Then, analogically, also *xāsawa ju*ˀ came into being (Honti 1990: 76; 1993: 204).[1]

This most intelligent explanation shows that a difference has always to be made between a practical counting system and a grammatical system of numerals. The numeral 'nine' is usually expressed subtractively in Uralic, and this presumably was also the case in Yurak (even if we do not know today how the numeral originally sounded). Independently of the morphological structure of their numerals, the Yuraks bound their squirrel skins into bundles, nine pieces each, so that (or because) nine was a whole, a unit in their counting system.

L. Honti's other conclusion is as follows:

"Man kann damit rechnen, daß die Juraken die 9 als eine der sog. magischen Zahlen unter dem Einfluß von ihren altaischsprachigen Nachbarn zu schätzen gelernt haben" (Honti 1990: 75sq.).

Speaking about "altaischsprachige Nachbarn" in the nonal context certainly goes too far. But still more important is that this does not really tell us what magical function was typical of the numeral 'nine' and – a question at least just as intriguing – why squirrel skins were to be counted with awe or in a magical atmosphere.

## 3.

J.-P. Roux's article (1965) was not cited by L. Honti. Nevertheless, its title suggests that both 7 and 9 are numerals of symbolic (magical?) value in the Turkic linguistic world. On the other hand, among many examples displaying the use of different numerals (not only 7 and 9) with a more or less magical function, the number 9 almost never occurs in a context that is clearly symbolic. Let us first examine some examples adduced by J.-P. Roux:

[3.1] The phrases in the Old Turkic gravestone inscription for Kül (~ Köl) Tegin: "[…] il transperça six hommes […] Il sabra un septième homme […] Il abattit neuf hommes […] Monté sur le cheval blanc Eugsiz, Köl Tegin transperça neuf hommes" (Roux 1965: 39). – I am not really sure that the numeral 9 has a magical function here. At least the sequence "six hommes – un septième homme – neuf

[1] The fact that a designation of a bundle can also be used as a numeral is exemplified e.g. by Russ. *sorok* '40' (for this and some other examples see Fałowski 2011, esp. p. 12).

hommes" can also be interpreted as a stylistic device serving intensification of the dramatic atmosphere of the story.

[3.2] "Dans l'Oghuz name déjà cité et où, nous l'avons vu, 40 apparaît fréquemment, le chiffre 9 et mis en avant seulement à propos de l'origine des Qarluq: «après neuf jours, il ramena le cheval entier d'Oghuz qaghan»" (Roux 1965: 40). – Also this usage is not unambiguous enough. J.-P. Roux does not explain the magical essence of this fragment, either.

[3.3] In *Irk bitig* whose symbolic nature is obvious, the numeral 9 occurs only once – in the image of a nine horn deer: "je suis le cerf […] à neuf cors" (Roux 1965: 40).

[3.4] Mongolian banners were decorated with nine yak tails (Roux 1965: 40) and in Buryat funerals nine boys sang dirges for three days after the death and nine participants of the funeral went round the grave (*ibidem* 42). – These customs probably do have something to do with magic or symbols. In view of what will be said below, a sort of "astronomical symbolism" might very well be possible in this case.[1]

[3.5] There surely can be seen a symbolic value also in the fact that no less than nine persons should participate in a shamanistic performance and that sometimes a shaman is carried on a cloth sheet nine times around nine birches (Roux 1965: 44).[2]

[3.6] Less clear is the fact that the Siberian tree of life has seven or, sometimes, nine boughs, as well as that a Siberian shamanistic god mostly has seven or, sometimes, nine children (Roux 1965: 46-49). Anyway, "astronomical connections" seem to be highly possible here, as well.

There is no doubt that the number 7 occurs in the shamanistic context far more often than the number 9 (Roux 1965: 50). For that reason I would suggest that seven is the original magical number in shamanistic rites,

[1] Concerning this, cf. "Denn die alten Cimbrer und Gothen feyerten den 9ten Tag, den 9ten Monat, und das 9te Jahr, in welchen sie neunerley Opffer verrichteten […]" (Strahlenberg 1730: 75).

[2] Another symbol was certainly behind the following Tatar custom: "Denn wie die Tatarn Anno 1242 den Hertzog Henricum von Liegnitz in Böhmen geschlagen, haben sie 9. Säcke mit der Christen Ohren angefüllet, und als Sieges-Zeichen mitgenommen. […] Welches der berühmte König Boleslaus in Pohlen Anno 1259. glücklich revangiret, als er die Tatarischen Heerführer Najaja und Thelebouga überwunden, und wiederum 9. Säcke mit Tatarischen Ohren vom Wahl-Platz bringen lassen" (Strahlenberg 1730: 79). The behaviour of the Polish king, however, was only symbolic inasmuch as he wanted to show that he could take vengeance for any harm (and any ear).

whereas nine occurred only later and never managed to force out the number 7 or to establish the nonal system in place of the septimal.

4.

The question of the reason(s) for using exactly the number 7 for expressing some symbolic or magical content appears to be a little more complex that one would expect at first sight. An ethnological explanation would probably be that seven astronomical objects are visible to the naked eye from the Earth: Sun, Moon, Mercury, Venus, Mars, Jupiter and Saturn. This is of course true but L. Bazin (1963: 573sq.) was right when he said that there existed no Turkic names for Mercury and Saturn. The idea that they were extremely hard to notice can possibly be accepted for Mercury which is the smallest planet in the Solar System. As for Saturn, however, this explanation does not sound equally convincing because Saturn has been known to different peoples all over the world since ancient times. Be it as it may, without Mercury and Saturn there are, in the Solar System, only five astronomical objects with genuine names in the Turkic languages, and the question of the special status of the number 7 remains unanswered.

Venus can be best seen before sunrise (as the so-called "Morning Star") or after sunset (as the "Evening Star"). That is why J.-P. Roux assumed that the Old Turks did not identify the Morning and the Evening Star as one planet but, instead, thought them to be two separate planets. He assumed the same thing for Mars, too, although Mars was recognized as one object already in Babylonia and the Ancient Egypt.

It was on this basis that Roux (1965: 52) reconstructed the following system of seven astronomical objects observed in the Old Turkic times which he believed to have been the reason for a special status of the number 7: Sun, Moon, Jupiter, Morning Star (Venus), Evening Star (Venus), Morning Mars, Evening Mars.

This solution might appear very clever at first thought, but one can, on closer examination, easily notice its weak points:

[4.1] If the Old Turks perceived the Morning and the Evening Star as two different objects why did they use only one name for both of them?[1] Similarly, there existed only one name for Mars.[2]

[1] This name was *erklig* 'strong' (Bazin 1963: 575). The other name for Venus, namely *jaruk julduzy* 'Light Star' (ibidem 576), will only appear in the dictionary by Mahmud Kašgari (11th century) but it, too, will concern both the Morning and the Evening Star.

[2] It was: *bakyr sokum* (Bazin 1963: 576) 'an arrow-head protection cap, made of copper'.

[4.2] Even if no genuine Turkic names for Mercury and Saturn are known to *us*, the conclusion that they were unknown to *Old Turks* either, and that the Old Turks did not know anything about the existence of these planets seems somewhat rash. – From the fact that a 'brother-in-law' is called in Polish *szwagier*, i.e. with a word borrowed from German *Schwager* in the 16th century it does not ensue that Old Poles did not know the institution of (~ observe any) brothers-in-law before the 16th century. Similarly the fact that English *veal* is a borrowing from Norman French does not mean that the English never ventured to eat the meat of their calves before the Conquest of 1066.

[4.3] The number 7 is connected with magic and mysterious symbolism in several other contexts and places, too. Siberian gods mostly had seven children, and Niobe in Greek mythology had seven daughters and seven sons. Besides, we have for instance Seven Wonders of the Ancient World; seven deadly sins and seven Christian sacraments; our seven day week originates from Jewish and Babylonian traditions; there were seven liberal arts in our mediaeval universities and there are Seven Lucky Gods in Japanese mythology; seven league boots are well known in European folklore and the theory of seven elements is well known in Arab alchemy; the Roman Kingdom was, according to tradition, ruled by seven kings, and its capital, Rome, located on seven hills, has even today Seven Pilgrim Churches, and so on and so forth.[1] Obviously, there was

[1] Even the Siberian dilemma "7 or 9" has its parallel: European (~ continental) cats are generally said to have seven lives, whereas English cats have nine. (My younger son [now 17], however, did not hesitate for a moment to answer in the affirmative when I asked him while working on this article whether a cat has nine lives, and his opinion was shared by his friends of the same age. I wonder if this shows the influence of American animated cartoons and computer games. At any rate, my elder son [now 29] still believes that cats have only seven lives. And a short interview with students [aged approx. 20] essentially ended in a draw: out of eleven interviewed students, six were in favour of nine lives, five in favour of seven. The longevity of Polish cats seems to be getting better all the time).

Among some other examples for the magical power of the number 7, Strahlenberg adduces also the following opinion (which is of some importance for the method of multiplication of smaller units in order to create a greater unit, as in the case of 3 x 3 = 9 below): "Wer ein mehrers von dieſer Zahl beysammen haben will, kan noch hinzufügen: daß, wenn ein Kind im siebten Monath gebohren wird, es eben ſo wohl beym Leben bleiben könne, als wie im neundten; aber nicht im achten Monath […] Ingleichen, daß ein jeder Menſch in ſeiner Natur alle 7. Jahre einer ſonderlichen und wichtigen Veränderung unterworffen ſey, welche Jahre, ſonderlich das 49ſte, daher anni climacterici heiſſen &c. &c." (Strahlenberg 1730: 75).

some other reason in all these cultures than failing knowledge of astronomical objects.[1]

[4.4] Why were the Pleiades[2] and the Pole Star excluded from Roux's list? It is especially the Pole Star that should be taken very seriously in the Siberian context because it is the central point of sky in the shamanistic image of the Universe in the mythology of another Siberian linguistic family, viz. that of the Yeniseians (Werner 2007: 62). Moreover, the constellation called the Great Bear consists of exactly seven stars, well visible to the naked eye (Zieme 1994: 149sq.). This fact, too, could be of importance for the status of the number 7.

My conclusion is that the special spiritual (symbolic?, magical?) status of the number 7 in Siberian languages should be connected, as it is virtually all over the world, with the fact that seven objects can be easily found in different astronomical combinations (e.g., Solar System; Pole Star; the Pleiades; the Great Bear), rather than requiring special pleading based on the alleged insufficient observational abilities of the Old Turks and their resulting poor knowledge of astronomy.

Still more complex is the question of the origins of the nonal counting system and the reason for replacing the septimal system with the nonal one. Roux (1965: 52) tried to explain this phenomenon either by a later discovery of Mercury and Saturn (which appears most unrealistic) or by an influence of notions from foreign astronomical or astrological systems like the North Lunar Node called *Rahu* in Hindi and the South Lunar Node called *Ketu*. Both nodes are considered separate planets in the Hindu *Jyotisha* astronomy. However, no traces of such an Indian influence can be observed in the Old Turkic linguistic monuments.

Furthermore, the *Jyotisha* planet system included also Mercury and Saturn. It would be most surprising to see that the Old Turks included *Rahu* and *Ketu* but neither Mercury nor Saturn. But if they had taken over from *Jyotisha* astronomy all the planets unknown to them previously, the

[1] If the number 7 (and this is, of course, valid for the number 9, as well) had a special spiritual value, one can also suppose it to be somehow connected with linguistic taboo and secret languages; such things are, however, little known in Turkic and Siberian linguistics yet and this fact may be the reason that I could not find – in a quick spot test made on the basis of three randomly chosen articles from different decades and countries (Samojlovič 1915; Laude-Cirtautas 1976; Knüppel 2010) – even a single hint at limitations on numerals in the Turkic languages. This promises to be an interesting research topic for the future.

[2] The Old Polish (16th c.) name for the Pleiades was just *siedm* [!] *gwiazd* 'seven stars' (Waniakowa 2003: 83, fn. 14).

Turkic system would have had nine of them: Sun, Moon, Mars, Jupiter, Venus, Mercury, Saturn, Rahu, Ketu, and this was never the case.

I would, in this situation, rather suggest another solution. Roux was seeking an astronomical explanation for both 7-based and 9-based system and he accepted Bazin's observation:

"Infolgedessen ist es nicht erstaunlich, daß die alttürkischen Völker allgemein nur die drei Planeten kannten, die gut sichtbar waren und besonders hervortraten, nämlich Venus, Jupiter und Mars. Für diese drei Gestirne gibt es echt türkische Namen in den alten Quellen" (Bazin 1963: 574sq.).

However, a functional differentiation between seven and nine can be observed, as well. In religious context, the number 7 clearly dominates, whereas nine can only relatively sporadically be encountered. In commercial and arithmetical context the situation is a little different: here, the numbers 3 and 9 dominate, while seven seems not to occur at all. This is why I am not really prepared to explain both counting systems with astronomical data alone.

In commercial activities counting is of course extremely important. It is also obvious that its main form in numerous older cultures was finger counting.[1] Apart from the thumb, each finger has three joints that can easily be used while counting. If we abstract away from the little finger that is definitely smaller and therefore less convenient for counting than other fingers we have three "counting fingers" (index, middle and ring finger), with three joints each. This is an ideal situation for employing a method of producing a higher unit in that the lower one is multiplied by itself, as is also the case with Fr. *(la) grosse* 'gross' (> Engl. *gross*, Pol. *gros*, Germ. *Gros* id.) < *la grosse douzaine* 'a great dozen', i.e. 12 x 12 (= 144 pieces) or 'dozen times dozen'. Analogically, if a small unit = 3, then a great one = 3 x 3 = 9 (and this fact was realized already in the ancient times, cf. Strahlenberg 1730: 76). Especially, if one can count along one's finger joints.

The following conclusions are reasonable:

[4.5] The astronomically substantiated 7-based counting system dominated in religious and spiritual matters.

[4.6] The practically (finger counting) substantiated 9-based counting system originally dominated in commercial matters (and in secular matters generally).

[1] Cf. e.g. Turkic and Mongolian "finger games" used to teach children finger counting (Dybo 1995: 17 sq.). Needless to say, also other body parts were in different cultures used as "counting instruments".

[4.7] With the passing of time, the number 9 received the meaning of a whole or a full set, a perfect quantity. This led to both following changes ([4.8-9]):

[4.8] In commercial matters, the word for 9 began to mean 'a whole, a set', independently of the real number of the components. This situation, in Samoyed, led to producing the compound *xāsawa ju* 'Samoyed/Yurak bundle' for '9'.

[4.9] Simultaneously, the situation in [4.7] made the number 7 (earlier occurring in religious contexts) somehow imperfect because forming only a part of a perfect nine. The natural consequence was an attempted – albeit never really completed – spread of the number 9 to religious matters (and spiritual matters generally).[1]

[4.10] It was in the early 17th century at the latest (the Russian conquest of Siberia started in the late 16th century) that the number 10 appeared in Siberia as a new "perfect quantity" and, at the same time, as a symbol (the third one…) of a full set. The competition between 9 and 10 in commercial and tax matters began. But the number 7 was never threatened by 10 since Russian merchants and tax collectors did not influence Siberian mythology and had no intention of interfering in the spiritual life of the native peoples of Siberia.[2]

## 5.

An indispensible condition for the emergence of the Yurak numerals *xāsawajūr*$^{?}$ '90' and *xāsawajonar*$^{?}$ '900' (Honti 1990: 74) was the existence

[1] The chronology of this spread remains unclear. In the Old Turkic inscriptions, dating from the 9th century or earlier, cited by Roux (1965), no usage of the number nine in spiritual contexts could be demonstrated. For this reason, the 9th century might be accepted as the *terminus post quem* of the spread. On the other hand, examples of the symbolic, even spiritual usage of the number 9 can be seen in very different areas, some being quite remote from North Mongolia where the Turkic runic texts were written (cf. Strahlenberg 1730: 79-81). This does not necessarily mean that the role of the number 9 always originates from the very same source, independently of time, area and culture. It is *in Siberia* that the practical and commercial origin of its importance seems to me more realistic than any spiritual one.

[2] Since the Yuraks became acquainted with Russians sometime in the early 17th century (for the contact succession in Siberia see Janhunen 1985, esp. the diagram on p. 77) their expression *lūca ju* 'Russian bundle', too, will have been coined at approximately the same period. Consequently, also *xāsawa ju* 'Samoyed/Yurak bundle' was coined at those times. We can only roughly assume that the change of *ju* into *ju*$^{?}$, as described by Honti (see above), occurred somewhat later, probably not before the second half of the 17th century.

of Yur. *xāsawaju*$^{?}$ '9' which created a derivational model for decimal multiples of 9. This leads us to consider theories elaborated to explain the structure and the origin of the East Slavic numeral '90': Russ. Ukr. *devjanósto*, Byel. *dzevjanósta* (besides, once attested also as Pol. (1420) *dziewiętnosto* id.).

It is not my aim here to discuss all the etymological proposals published so far. I am only going to discuss one study by E. P. Hamp (1975) who takes an Old Turkic counting system as model and tries to explain the Slavic numeral as the result of loan translation of the Old Turkic word for 'ninety'.

The Old Turks had two counting systems. They are mostly known by the German terms *Unterstufenzählung* (i.e. 'Lower Rank Counting' = LRC) and *Oberstufenzählung* (i.e. 'Higher Rank Counting' = HRC).[1]

In the LRC system, tens are followed by units (*otuz* '30' + *üč* '3' = *otuz üč* '33'). Sometimes, the word *artuky* 'more than; ≈ plus' may be used between them: *otuz artuky üč* '33'.

The situation is somewhat more interesting in the HRC system. Here, units are "removed" ~ "borrowed" ~ "taken" from a *higher* ten. Structurally, units precede tens, e.g. *üč* '3' + *otuz* '30' = *üč otuz* '23'. One is possibly inclined to translate it as '3 towards 30'; however, the original meaning, connected with the Chinese calendar, was approximately: 'three (from) thirty', i.e. 'the third day taken from the (twenty till) thirty decade' (cf. Clark 1996: 39).

In this context two sentences of Hamp's are of special interest:

[5.1] "Thus a [Slavo-Turkic] bilingual in this situation might well have said 5 + 100 to mean '95' […]" (Hamp 1975: 220).

[5.2] It goes on to say that Hamp's Proto-Slavic reconstruct **devьnó sъtó* '9$^{th}$ *sъto*' is "a well-formed phrase composed of elements of considerable antiquity, but reflecting Turkic semantics […]" (Hamp 1975: 221).

Both statements are wrong.

We have to start with the fact that a unit followed by the number 10 (*on*) or its integral powers (*jüz* '100', *biŋ* ~ *byŋ* '1000', *tümen* '10,000') implies multiplication. Thus Hamp's linguistically expressed "5 + 100" in [5.1], standing no doubt for *biš jüz* (*biš* ~ *bėš* '5', *jüz* '100'), can only have meant mathematically "5 x 100", i.e. 500. It was thus absolutely impos-

[1] L. Clark (1996) suggested 'zero-based system' for LRC and 'one-based system' for HRC. However, these terms do not appear very often in Turkological literature.

sible to use *biš jüz* with the meaning of 95 in Old Turkic (for '95' see also below).

As a result, the HRC system was only valid for units between 11 and 89.[1] The numbers 91-99 could have not been possibly expressed this way because the following numeral would have been *jüz* '100', and this implied multiplication. Instead the following rule applied:

"To designate numbers 91-99 in the 10th decade, the standard language incorporated the *örki* 'higher (than 90)' device into this system. Use of *örki* averted a kind of mistake that would be made in a number like *tokuz yüz* which had to designate '900' rather than '99'." (Clark 1996: 21)

Thus, a numeral *biš jüz*, as suggested by Hamp, would have exclusively designated 500, whereas the number 95 would have been expressed by *biš örki*, lit. 'five higher', i.e. 'five higher than 90'. Further examples can be found in Erdal (2004: 221): *alty jüz* is 600, not 96; *tokuz örki* is 99; *sekiz jüz alty örki* is 896 (lit. *sekiz* '8' *jüz* '100' = 800; *alty* '6' *örki* 'higher (than 90)' = 96).

Summing up, there could never have possibly existed an Old Turkic numeral signifying '90' whose Slavic calque would have been **devętnó sętó* '9th *sęto*'. The reasons are these:

[5.3] The HRC system was never used to express tens.
[5.4] If the second numeral in an HRC compound was a whole ten or its integral power, this was multiplied by the preceding numeral in the compound.
[5.5] The first numeral in an HRC compound never was an ordinal number.

Thus Hamp's (1975: 221) Proto-Slavic construct for '90' allegedly "reflecting Turkic semantics" is entirely without foundation.

## 6.

Let us present seven (!) conclusions now:

[6.1] The magical implications of the number 7 in Siberia seem to result from astronomical observations.
[6.2] The number 9 was considered a whole unit, a full set in Siberia

[1] In the oldest Orkhon runic texts, the HRC system was used for the interval [11, 29] which is to be connected with its original employment in counting the days of the month. The only exception attested in runic Turkic is *bir kyrk* '31' in the epitaph for Kül Tegin (Clark 1996: 20).

which resulted from commercial and arithmetical facts (like finger joint counting), rather than from religious, symbolic or magical, in short, spiritual reasons. This opinion does not necessarily concern all other areas in which the number 9 has a special status.

[6.3] The nonal counting system should not be confused with lexical numeral systems. The numeral systems seem to have generally been decimal all over Siberia.

[6.4] The nonal counting system had a determining influence on the higher numerals: 90 and 900 in Yurak only.

[6.5] The numerals for 8 and 9 are expressed in one of the two following ways in Siberia: either by a separate lexeme or subtractively.

[6.6] No traces of the nonal counting system can be observed in Yeniseic languages. On the other hand, not exclusively 8 and 9 but also all other numerals including 8 or 9 (like 18, 19, 28, 29, and so on) are expressed subtractively in some Yeniseic languages which possibly reflects a Uralic influence.

[6.7] There exist no reasons (concerning either the higher rank or the nonal counting system) for interpreting the East Slavic numeral *devjanósto* (and alike) '90' as a calque of an Old Turkic numeral compound.

## Abbreviations

| | | |
|---|---|---|
| Arin. | = | Arinian |
| Assan. | = | Assanian |
| Bshk. | = | Bashkir |
| Byel. | = | Byelorussian |
| Chag. | = | Chagatay |
| Engl. | = | English |
| Fr. | = | French |
| Germ. | = | German |
| GTkc. | = | General Turkic (~ Standard Turkic = Turkic without Bulgarian) |
| Ket. | = | Ketish |
| Kirgh. | = | Kirghiz |
| Kott. | = | Kottish |
| Kzk. | = | Kazakh |
| Mo. | = | Mongolian |
| OPol. | = | Old Polish |
| OTkc. | = | Old Turkic |
| Pol. | = | Polish |
| PreTkc. | = | Pre-Turkic |

PSlav. = Proto-Slavic
PTkc. = Proto-Turkic
Pump. = Pumpokolian
Russ. = Russian
Tkc. = Turkic
Tksh = Turkish
Ukr. = Ukrainian
Yur. = Yurak

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