

Uralic ‘wheel’

The origin and diffusion of the wheel is the subject of one of the most classical issues in Indo-European linguistics. It is generally held that the invention of wheel in the late Neolithic and its adoption in early vehicle technology probably took place at the time when Indo-European proto-language was spoken. According to this assumption the spreading of wheel and chariot technology to India and Europe during the 4th millennium B.C. reflects an early diffusion of the Indo-European languages over a large geographical area. The importance of wheeled vehicles and their technological supplies and applications is evidenced in the vocabulary of Indo-European languages, which includes many word stems that are derived from Proto-Indo-European and, consequently, demonstrates chronological correspondence between archaeological and linguistic data. The conclusion that has been drawn in Indo-European studies is that the vocabulary connected with the wheel and early wheel technology is inherited and is not the result of mutual borrowing. Because the vocabulary connected with early wheel technology has representatives in all Indo-European languages, it must have originated in Proto-Indo-European. (Anthony 1995: 557, Beekes 1995: 37, 171, 190, Carpelan & Parpola 2001: 58–60, Parpola 1999: 183–184).

This article discusses the same issue from the viewpoint of the Uralic languages. Although it is maintained that the invention of the wheel had considerable importance in the development of early technology and played an important role in various applications especially in the field of transportation and agriculture for the Indo-European-speaking cultures, it was much less important in the Uralic-speaking areas. The following data suggest that contacts with Indo-Europeans were significant for the adoption of wheel in those areas in which the Uralic languages used to be spoken, and this adoption took place in different areas independently.

As a matter of fact, the history of the Uralic languages only weakly motivates a closer survey of the lexical history of ‘wheel’. The point of this article is that, nevertheless, the influence of the Indo-European languages was important for the development of prehistoric cultural relations. Repeated lexical borrowing and contacts with adjacent Indo-European and Uralic populations illustrate how ‘wheel’ was adopted into Uralic. A new etymology will be presented for the Livonian *kõr* ‘wheel’ and the Mordvinic (Erzya) *čaro*, *čari* (Moksha) *šari* ‘wheel’.

The history of the wheel in the Uralic languages

Compared to Indo-European languages the Uralic languages extend geographically over a more northerly area in the boreal forest belt and tundra. Transport and mobility have needed and applied a greater variety of technical innovations than in the more southerly latitudes and those vegetation zones such as the steppes and meadows that form a more open space for mobility. In the forest zone water routes have connected the remote geographical areas, while the sleigh has

maintained its importance as a means of transport in the more arctic zones until the present. The importance of the sleigh for the nomadic Uralic-speaking peoples and tribes of the northern tundra is illustrated in old vocabulary. Häkkinen (2001) lists 32 old Uralic (Proto-Uralic/Proto-Finno-Ugric) word stems related to transport and mobility that are traces of the protolanguage stage. This list, based on the data of *Uralisches etymologisches Wörterbuch* (UEW), includes two nouns meaning ‘sleigh’ or ‘sledge’ in the Uralic languages, namely **aški* (SSA 1: 52–53, UEW 20) and **sona* (UEW 485–486). However, it must be noted that Sammallahti (1988), for instance, does not mention these etymologies because they are phonologically problematic.

Regardless of the correctness of these two etymologies we may state that there is no trace of an early wheel technology nor the concept ‘wheel’ in the old Uralic vocabulary. Lexical evidence of this kind has traditionally been considered important in relation to the early distribution of the Uralic languages (Hajdú 1976: 6–10, Hajdú & Domokos 1980: 45–92, Häkkinen 1996: 103–166, 2001, Erkki Itkonen 1960, Zsirai 1994 (1937); 113–133). Consequently, sleigh and vehicles that can be applied to water routes have presumably played a much more important role than vehicles on wheels, and the vocabulary of the Uralic languages suggests that is a late technological innovation in Uralic-speaking areas. Räsänen (1953), for instance, considered the use of the sleigh and the development of winter transport technology important in the discussion of the prehistoric distribution of the Uralic languages.

The late origin of ‘wheel’ in the Uralic languages is illustratively demonstrated in the geographical distribution of those words that denote it in the present-day languages. There is no word that is attested in more than one individual branch of the Uralic languages. Only loanwords cover a larger language area. There are considerable lexical differences between closely related languages such as Saamic or Finnic. The Samoyedic languages are examples of present-day Uralic languages that do not even include the concept ‘wheel’. According to Lehtisalo (1956) and Donner & al. (SkWb 2004), Nenets and Selkup do not have a word for this at all, whereas the Kamas word *dərəngo-pā* ‘wheel’ is a transparent compound word consisting of the words ‘round’ + ‘tree’ (Donner & Joki 1944: 13). Considering the late origin of ‘wheel’ in the Uralic languages it is illustrative that the Russian *kolесо* ‘wheel’ was borrowed into many individual languages and dialects such as Skolt Saami, Veps, Mordvinic, Udmurt, Komi, and Mansi.

Lexical evidence of present-day Uralic languages

The following overview presents a concise summary on those words that mean ‘wheel’ in the present-day Uralic languages according to published dictionaries. The compilation of the data is primarily based on the basic meaning ‘wheel’ and compound words and derivations are taken into account only if they have more general importance for the adoption of ‘wheel’ in the given language. The list seeks not to be exhaustive and include every individual Uralic language or very exhaustive in its etymological comments. However, the list is meant to be sufficiently extensive for conclusions to be drawn on the historical development of ‘wheel’ in the Uralic languages.

Saamic

The Saamic languages have borrowed ‘wheel’ from three different directions, namely Scandinavian, Finnish and Russian. North Saami *jorri* ‘wheel’ is actually a participle form and derived from the verb *jorrat* ‘roll, twirl’. The word *juvla* is borrowed from Scandinavian (cf. Old Icelandic *hjól*, Swedish *hjul* ‘wheel’). North Saami *ráhtis* ‘wheel’ and Inari Saami *räätis* ‘id.’ are borrowed from Finnish *ratas* ‘wheel’ that is a loan word, too (cf. below). Skolt Saami *káá lez* ‘roll; wheel’ is borrowed from the Russian *koleso* ‘wheel’. (T.I.Itkonen 1958: 142, 868, Iwb III: 18, Lagercrantz 1939: 80, 720, 798, Sammallahti 1989, SKES 743, SSA 3: 53.)

Finnic

In the Finnic languages the most widespread word meaning ‘wheel’ is the Finnish, Karelian and Estonian *ratas*, Vote *rataz* ‘wheel; carriage (Finnish plural form)’, Livonian *rattōd* (pl.) ‘carriage’. The word is an old Baltic loan and borrowed from Proto-Baltic **ratas*, cf. Lithuanian *rātas*, Latvian *rats* ‘wheel, circle’, Lithuanian plural *rātai* ‘carriage, chariot’ with cognates in other Indo-European languages, such as Old Indian *rātha-* ‘chariot’, Latin *rota* ‘wheel’, German *Rad* ‘wheel’, etc. (Fraenkel 1955–65: 703, SKES 743, SSA 3: 53). The newer etymological Finnish dictionary (SSA 2: 455) labels the Finnish *pyörä* ‘wheel’, and this has etymologically cognate nouns in Ingrian, Karelian, Vote and Estonian and verbs in other Finnic languages as well, as a word with an origin that was probably descriptive.

Veps *kezr* ‘wheel’ and certain Karelian dialects *kesrä*, *kezrä* ‘disk; wheel’ (~ Finnish *kehrä* ‘spindle (whorl)’) display a word that was influenced by a semantic change. This word is widely represented in Finnic, Saamic and Mordvinic and originally referred to a ‘distaff; spindle’, as the related languages and the Indo-Iranian loanword source **keṛtro-/*kēṛtro-* suggest (SSA 1: 336).

In Livonian the basic word denoting ‘wheel’ is *kōr*, also *gōr* and in the western-most dialectal variants *gār*. The closed vowel and voiced plosive in the latter forms are secondary (Posti 1942: 18–19). Kettunen (1938: 57, 121) does not mention any unambiguous cognates in other Finnic languages. The etymology of the word is ambiguous at first sight, because there is another word *kōr* ‘circle, round’ that has a short vowel but is semantically and phonologically very close to *kōr* ‘wheel’. In the etymological dictionaries of the Finnish language Livonian *kōr* ‘circle, round’ has been connected to the Finnish *keri*, *kere* ‘frame, the ring of a stick (for skiing), a ring made of birchbark’, etc., with cognates in Vote and Estonian (SKES 182–183, SSA 1: 345). However, semantically the parallels of other Finnic languages are not very close to the Livonian *kōr* ‘wheel’, and from the viewpoint of historical phonology the Livonian *kōr* actually implies a reconstruction with a back vowel in the second syllable. Also, *kōr*: *kōrūd* actually implies a historical back vowel in the second syllable as well.

As regards *kōr* ‘wheel’, a historical short vowel in the first syllable would be short in Livonian as in *ōra* ‘slobber’ ~ Finnish *hera* ‘whew’. If the second-syllable vowel were historically a front vowel, one would expect to find (*i*)*e* in the first syllable (Posti 1942: 17–19). The expected form would then be **k(i)er* as in the Livonian *ver* ‘blood’ ~ Finnish *veri*. The lengthening of the first-syllable *ō* took place in front of *-r-*, if the first syllable was historically long as in the Livonian *mōrda* ‘(a special) fish trap’ ~ Finnish *merta* id. and Livonian *tōra* (*tīra*) ‘tar’ ~ Finnish *terva* id. As regards the background to *ō*, it is considered an innovation in those Finnic languages that possess it, that is, Vote and Estonian, and mutatis mutandis Livonian (Holst

2001, Lauerma 1993: 29–45). So, the rise of \bar{o} in the given Livonian word can only be explained by means of sound change.

It appears worth considering whether the Livonian word (< Proto-Finnic/Old Livonian **kerra*) was borrowed from the Old Norse *kerra* ‘carriage’ (cf. Icelandic *kerra*, Swedish *kärra*, Danish *kærre*) that originated from Proto-Scandinavian **karriō(n)*. The Scandinavian word is borrowed from Latin *carra*, *carrus* ‘four-edged transport vehicle’ with a long history (Hellquist 1948: 548, Jóhannesson 1956: 1047, de Vries 1961: 307). Semantically, the relationship between ‘wheel’ and ‘carriage’ is similar to the semantic diversity of the Finnic *ratas* (see, above) and the development of words meaning ‘wheel’ in many other Indo-European and Uralic languages (cf. Mordvinic and Mari below). However, the suggested etymology also raises a phonological problem, because one would expect the second-syllable vowel *-a* to have been preserved in Livonian and the result would have been **kōra* instead of *kōr* as in the words mentioned above.

The Livonian *kōr* ‘wheel’ has an etymological cognate in the Estonian *kōõr* ‘wheel’s (wooden) frame’ (genitive *kōõre*) noun that has a very limited distribution in western dialects, whereas a close parallel to it *kōõr* ‘decorative ribbon’ (genitive *kōõri*) is occasionally met in southern dialects and in the west coast islands (EMS 4: 375). The inflection of *sõõre* ‘nostril’ : (genitive) *sõõrme* (~ Finnish *sierain* id. with a back vowel in the second syllable) demonstrates that words that used to have a back vowel in the second syllable may change paradigm type. This lends some support to the assumption that the Livonian *kōr* ‘wheel’ is a relatively late Scandinavian loanword.

Mordvinic

As with several other Uralic languages, the Mordvinic languages display a local variant of the Russian *koleso* ‘wheel’ that is manifested in the Erzya *kol'isa*, Moksha *kal'osa* (MdWb 838–839) that historically refer to different dialect types of Russian. The former represents an *okanje* form while the latter has its roots in an *akanje* dialect.

Besides this transparent Russian loan, the Mordvinic languages display another word for ‘wheel’, namely E *čari*, *čaro*, M *šari* ‘wheel, ring’ (MdWb 214–216). The standard Erzya variant is *čari*. The Mordvin dictionary of Heikki Paasonen presents the given word under the entry for E *čarams*, M *šarāms* ‘swing; roll’ and the Moksha *šari* ‘wheel, ring’ actually corresponds to the participle form of the verb. However, E *čari*, *čaro*, M *šari* ‘wheel, ring’ is obviously an Iranian loan:

< Proto Mordvin **čari* (or **čaro* < **čara*)
 < Iranian **čarx* (< Indo-Iranian **cakrā-* ‘wheel’, cf. Sanskrit *cakrá*, Shina (dial.) *čarkū*, Kashmir *čakh^hr* ‘id.’, Greek *kúklos* ‘circle’, Old English *hwēol* (> English *wheel*), Tocharian A *kukäl*, B *kokale* ‘carriage’, etc.), cf. Avestan *čaxrō*, Persian *čarx* ‘wheel, circle’, Sogdi **čaxr-*, **čarx-*, Kurdish *cāra* (Abaev 1958–1986, 1: 287–288, Mayrhofer 1956–76, 1: 366, Turner 1966: 246).

The phonological correspondence between the Mordvinic and Iranian words is not entirely unproblematic but, however, an Iranian origin appears to be an obvious and the most likely explanation for the origin of the Mordvinic word. It is the second syllable that is the problematic

part of the etymology; the point being that on balance the older Indo-Iranian variant seems less likely to be the source of the Mordvinic word than the Iranian one. The Iranian word is a descendant of the old Indo-European word family that is a part of those concepts that witnessed the adoption of wheel technology. The Proto-Indo-European reconstruction from which the listed forms of individual Indo-European branches can be derived is **k^we-k^wl-os*. Beekes (1995: 37, 171, 190) determines the cultural form of the early wheel in more detail by stating that the first wheels were massive and made out of one whole piece of timber. The metathetic form with *-rx-* instead of *-xr-* is widespread in the Caucasian languages which, according to Abaev (1958–1986, 1: 287–288), may reflect the influence on these of the Scythian languages.

Assuming that the suggested Iranian origin is essentially correct, the phonological development of the Mordvinic word has the following constraints. Firstly, the oldest inherited Finno-Ugric (Uralic) vocabulary does not include words with the consonant cluster **-kr-* (cf. Sammallahti 1988). However, evidence from the Finnic and Saamic languages suggests that language contact can trigger this kind of innovation. In general, they adopted combinations of a plosive and a liquid *-kr-*, *-pr-* and *-tr-* under the influence of language contact with the neighbouring Indo-European languages (Koivulehto 1988). More recently, Koivulehto (Koivulehto 1999: 230, SSA 3: 260) has pointed out that one of the words with a historical **-kr-* in the Finnic languages, Finnish and Karelian *takra* ‘bait’, Veps *tagr* : *tagrāne* ‘soft meat of a fish’ < Proto-Finnic **takra* << Indo-Iranian **dātra*. This suggests that the Indo-Iranian *-kr-* of Indo-Iranian *cakrā-* ‘wheel’ would probably have been transferred as such to Pre-Mordvinic as well as it was borrowed to Pre-Finnic, if it had been the source. Furthermore, the palatovelar word-initial affricate *č-* supports an Iranian origin for the Mordvinic word instead of Indo-Iranian.

Secondly, inherited words with the consonant cluster **-rk-*, such as E *kargo*, M *kargo* ‘crane’ and E *s’erge*, M *šārgä* ‘roach’ have preserved both elements in Mordvinic although the plosive became voiced. Basically, one would assume that the Iranian *-rx-* could have been replaced with Pre-Mordvin **-rk-*. However, the present-day Mordvinic forms suggest that the Iranian fricative was simply lost. Conceivably, it seems that the monosyllabic Iranian word ending in a consonant cluster was converted into a disyllabic word corresponding to the phonological basic structure CVCV that was most widespread in early Uralic varieties (Proto-Uralic, Proto-Finno-Ugric). A further assumption is that, unlike inherited words ending in a close vowel (cf. Bartens 1999: 64–65), the second-syllable *-i* was preserved in the given word. So, evidence of contacts with the Iranian languages must be considered important for determining the relative chronology of the sound history of the Mordvinic languages.

Mari

In Mari the basic concept of ‘wheel’ is Meadow Mari *orawa*, Hill Mari *arawa* ‘wheel’ that is a loanword and originates from the Chuvash *oraBa* ‘carriage’ corresponding to Tatar *arba* ‘carriage’, a widely spread word in the Turkic languages. The Birska and Uržum dialects display the variant *orwa* ‘carriage; wheel’, whereas the northwestern dialects display the same variant *arawa* as other western dialects (Ivanov & Tužarov 1971: 16, Paasonen & Siro 1948: 85, Räsänen 1920: 168, 1969: 23, Sevortjan 1974: 64). The same Chuvash word was borrowed into Udmurt, in which *urobo*, *robo* has the meaning ‘peasant carriage’ (WW 300). Interestingly, as Isanbaev (1989: 142) notes, modern Standard (Meadow) Mari has adopted both variants, *orawa*

‘wheel’ and *orwa* ‘carriage’ (Marij muter 4: 332, 336–337), and makes a lexical distinction between the two forms that are historically variants of one word.

Permic

The Permic languages yield much lexical variation including derived words and loanwords. Udmurt *kol'osa* (WW 120) and Komi *kōl'ōsa ~ kōl'esa* (Fokos-Fuchs 1959: 391) is a transparent loan from the Russian *koleso* ‘wheel’. The Udmurt *pitran* ‘wheel, disk; round’ (← *pityrany* ‘roll’ WW 197) and the two Komi words *gōgyl* ‘wheel, disk’ (← *gōg* ‘hub’; Fokos-Fuchs 1959: 234, Wichmann & Uotila 1942: 52) and *tyregan* ‘disk; wheel’ (← *tyredny* ‘roll (away)’; Wichmann & Uotila 1942: 278) are derivations. Historically, both types of etymology indicate a relatively late origin for the word. The Komi *ts'il'gan* ‘wheel’ has a very limited distribution in the dialects (Wichmann & Uotila 1942: 300) and is not included in all dictionaries. Structurally, this is a deverbal derivation as well.

Ugric

Other branches of the Uralic languages, the Ugric languages, do not have one single word denoting ‘wheel’ that would be represented in every individual language. On the contrary, Hungarian, Mansi and Khanty all display different words. Hungarian *kerék* ‘wheel’ historically descends from the adjective *kerek* ‘round’ that has etymological cognates in Mansi, Khanty, Saamic, and Finnic (EWU 734–735, UEW 147). The latter belongs to those few adjectives that originate from an early Proto-Finno-Ugric (Proto-Uralic) variety. Nevertheless, nothing supports an assertion that the meaning ‘wheel’ can be very old, although it is attested in early Hungarian literary records.

It is questionable to what extent the speakers of the two Siberian languages Mansi and Khanty have used the concept ‘wheel’, since speakers of most Samoyed languages engaged in a similar way of life have not known it at all. The Mansi *kol'os* ‘wheel’ (Munkácsi 1986: 218) can be added to the list of languages that have borrowed the concept from the Russian *koleso* id. The other words attested in Mansi and Khanty are participle derivations from verbs and have a more specific meaning, for instance, Mansi *pōtl'əp* ‘wheel’, *kaw-pōtl'əp* ‘water-mill’s wheel’ (Munkácsi 1986: 467, 203) and Khanty *pəryəttəp*, *pəŋəttəp* ‘wheel (a wooden children’s toy)’ and *porəkat* ‘wheel of the handle of a borer’ (OWb 720, 732).

Samoyedic

The dictionaries of the Nenets and Selkup Samoyedic languages do not mention the word ‘wheel’ at all, whereas the Kamas word *dəraŋgo-på* ‘wheel’ is a compound consisting of the words ‘round’ + ‘tree’ (Donner & Joki 1944: 13).

Conclusions

The point of departure for this paper is the semantic concept ‘wheel’ that is very important for the history of Indo-European languages, but considerably less important for the Uralic languages, as the historical evaluation of the corresponding lexical data clearly demonstrates. The discussion of this issue was organised in the form of an overview of corresponding words in the Uralic languages. The analysis was mainly limited to a brief presentation of the etymology of the words meaning ‘wheel’ in these. The vast majority have an Indo-European origin or another loanword etymology, resulting from the influence of the Turkic languages or mutual borrowing. An overview of the words meaning ‘wheel’ in the Uralic languages illustratively demonstrates that in prehistoric times the wheel was not important. On the contrary, given the long time span, the wheel has been adopted in Uralic-speaking areas only very recently.

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