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Early Metallurgy in Language: The History of Metal Names in Finnic[1]

In contrast to other continents, domestication of the horse made the inhabitants of the Eurasian steppes and forest steppes more mobile. Invention of smelting metals resulted in the mastering and use of more productive tools and more effective weapons. Metallic tools and weapons became important trade articles, and the vocabulary corresponding to these items spread over language and language family borders. Small nomadic or semi-nomadic mobile bands began to join together in order to raid, conquer new territories, and subjugate their neighbors. Other sedentary bands were forced to consolidate into larger groups in order to resist such attempts and practised a partly similar lifestyle. Unstable bands, tribes, and other minorities were assimilated into these larger consolidated groups. Whole languages and language families disappeared more quickly than earlier.

This article is an attempt to study metal names in the F-U languages starting from the very earliest point of their appearance in these languages. Although the Finnic languages are the focus of this study, the considerable, though weakly studied, background of this issue within the larger context of the Finno-Ugric languages is not ignored and is incorporated into an analysis seeking to identify shared features among the Finno-Ugric languages.

1. Metal names in Finno-Ugric

In the Finno-Ugric languages, most metal names are borrowings. In Table 1, the raised prefix letters indicate the origin of the names mainly following traditional views as expressed in Aulis J. Joki's important book "Uralier und Indogermanen" (1953) and in later etymological dictionaries, primarily in KÈSKJa, LÄGLOS, MNyTESz, MSzFE, UEW, SSA. Table 1 does not take into account etymologies presented in the posthumously published book by Hartmut Katz (2003), as many of them are vaguely argued and linguistically inadequate.

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In the following sections, the names of copper, gold, and iron in the Finno-Ugric languages will be analyzed in order to discuss the existing views on the contacts of the Finno-Ugrians at the beginning of Metal Ages, i.e. of the Bronze Age and Iron Age. Still it should be remembered that during the European Metal Ages the production of alloys like bronze or brass from different metals originating in different areas was based on longer local traditions of smelting copper, tin, or lead from a local ore.

Names for tin, lead, and silver will be discussed only inasmuch as they are etymologically related to names for copper or iron.

2. Names of gold

2.1. The Finnic and Saamic names for gold are borrowed from different Germanic sources. The Finnic name **kulta* is historically an older loan than the Saamic name **kullē* because in certain Scandinavian dialects the Proto-Germanic consonant cluster was simplified, cf. Proto-Germanic and Proto-Scandinavian **gulþa*, Gothic *gulþ*, Swedish and Danish *guld* vs. Old Norse, Icelandic, Faeroese, and Norwegian *gull* (cf., however, Old Swedish *goll* and Estonian Swedish *gull* as an indication that older and newer forms have existed side by side for a very long time). Old Swedish makes it possible to speculate that the Finnic form was received somewhere farther in the south from the historically attested Finnic area and the historically older forms may have been restored in one part of Swedish dialects due to language-external reasons.

2.2. Gold names in other Finno-Ugric languages are of Iranian origin. (Note that the Samoyedic languages are not discussed in the current paper.) The names for gold of Iranian origin are borrowed separately and from different sources (Joki 1973: 250). The words denoting 'gold' are listed in the first column from the left in Table 1. In addition, Iranian gold names have undergone a semantic shift in Moksha, Konda Mansi, Vah and Vasjugan Khanty and serve as copper names. The names can be divided into two layers.

In the oldest layer of borrowings, namely Hungarian *arany*, Vah Khanty *lōrńɜ*, Vasjugan Khanty *jōrńi*, and Moksha *śerəń*, the original Iranian initial consonant *z-*, cf. Avestan *zaranya* 'gold', has been substituted by **s*. The Proto-Ugric **s* was lost in Hungarian, shifted to *ʌ*, and is still preserved as such in Kazym and Surgut dialects, and later regularly merged into *l* in Vah and into *j* in Vasjugan dialect. In Mansi, the Ugric **s* is represented as *t* as well as in Central Ob and Irtysh Khanty. Furthermore, it is possible that also Konda Mansi *tā̆reń* and Pelym Mansi *tariń* 'copper' may belong to this series; still one cannot entirely exclude the possibility that these Mansi words go back to an Iranian source, such as Old Persian *daraniya* 'gold'. The same problem is true for the Pelym variant *tarńė* 'copper'.

All other Mansi and Khanty words denoting gold are characterized by a word-initial *s-* and represent a later layer of borrowings. As the initial *s-* in Ugric

inherited vocabulary and old Indo-European loans originates from the earlier consonant **ś* and there is no known reason to suppose a palatalized sibilant in Iranian, the Mansi and Khanty words for gold are usually considered loans from Komi.

It must be noted that both layers contain phonological stems with the patterns *(C)VCVC* and *CVCC(V)*, of which gold names of the latter type are unknown in Iranian. Compared to them, the Moksha form *śerə̑* 'copper' may have risen as a result of local simplification of a longer form, although it may also be a direct loan, due to the fact that in the best known modern Iranian languages the shorter pattern *CVC* prevails, cf. Kurdish *zêr*, (New) Persian, Tajiki and Dari *zar*. Like in Finno-Ugric, there are back and front vocalic stem variants also in Iranian, cf. Avestan *zaranya*, Persian *zar* vs. Ossetic *zærin*, Kurdish *zêr*. No stem form with *i* in the initial syllable is attested in Iranian. However, the Sanskrit gold name *hiranya* has *i*. Hence, it is unclear whether the vowel of the first syllable in Erzya *sʲirńe* and Moksha *śirńe* reflects a similar phonological form or pronunciation of an Iranian source language or whether it results from a local change. The great variation in West Iranian languages such as Avestan, Kurdish, Persian, Tajiki may be late, but this can neither be proven nor refuted. There is no evidence on the pattern variation in Northwest Iranian in which the word is attested only in Ossetic. There seems to exist only one Iranian language where the stem has the pattern CVCVC, namely Ossetic *zærin*.

Thus probably the set of separate loans denoting 'gold' from Iranian includes up to six stem types: (1a) Moksha *śerəń*; (1b) Konda Mansi *tə̄reń*; (1c) Hungarian *arany*; (1d) Vah Khanty *lōrńɜ* 'copper', Vasjugan Khanty *jōrńi* 'copper', Surgut Khanty *ʌŏrńi̯* - 'brass';[2] (2a) Erzya *sʲirńe*, Moksha *śirńe*, Mari *šörtńö* (< **serńe*; *-t-* maybe inserted by analogy of *körtńö*, *kərtńi* 'iron'); (2b) Permic *zarńi*, Mansi and Khanty *sVrńV*. In other words, in order to borrow the first type (1a–d), at least two Finno-Ugric languages or dialects must have been in contact with Iranian and at least two Finno-Ugric languages or dialects must also have been in contact with Iranian in order to receive the stems of the second layer (2a–b). To explain this variation in Finno-Ugric, Hartmut Katz (2003: 258) tries to derive all types from different stages of Proto-Iranian. Nevertheless, it is to be noted that all these hypothetical stages altogether cannot adequately reflect a meaningful history of a single Iranian language, such as Ossetic. Conclusively, there must have been different contacts with Iranian languages.

Finally, on the basis of the geographical distribution of gold names the Finno-Ugric linguistic area is divided into two zones, namely into (a) Saamic and Finnic that borrowed the word for 'gold' from the Germanic languages, and (b) into Mordvinic, Mari, Permic, and Ugric in which the word denoting 'gold' was borrowed from the Iranian languages. The first zone is the sphere of Germanic influences and the second zone the sphere of Iranian influences.

2. In Krasnoyarskiy Irtyš Khanty the form *ōrńɜ* 'gold' (KT 874a) is used in folklore texts instead of the usual noun *sōrńɜ*. Phonologically, *ōrńɜ* represents the type (2c). Note that types (1c) and (2c) share the loss of the Proto-Ugric initial **s* that is otherwise characteristic of Hungarian.

	Gold	Iron	Copper	Steel	Tin	Lead	Silver
Saami S	^{S}*güllie*	^{S}*ruövdie*	^{No}*guäppere*	^{No}*staalie*	^{S}*didnie*		^{S}*s´ïlbe*
Saami N	^{S}*gol'le*	^{S}*ruow'de*	^{A}*veai'ke*	^{No}*stálli*	^{S}*dâdne*	^{N}*laddjo*	^{S}*sil'bâ*
Saami I	^{S}*kolle*	^{S}*ryev´di*	^{A}*veški*	^{No}*stääli*	^{S}*tane*	^{N}*lajo*	^{S}*silba*
Saami Ki	^{S}*kå´ll*	^{S}*rū´vvd*	^{A}*vie´šš̆k*	^{Ru}*stā´ll*	^{S}*ta´nn*	^{Ru}*vį´nts*	^{S}*sį̄llb*
Finnish	^{G}*kulta*	^{G}*rauta*	^{A}*vaski*	*teräs*	^{S}*tina*	^{Sw}*lyijy*	*hopea*
			^{Sw}*kupari*				
Karelian S	^{G}*kulda*	^{G}*rauda*	^{A}*vaski*	*teräz*		^{S}*tina*	*hobie*
Veps C	^{G}*kuld*	^{G}*raud*	^{A}*vaśk*			^{S}*tin*	*hobed*
Estonian	^{G}*kuld*	^{G}*raud*	^{A}*vask*	*teras*	^{S}*tina*	^{S}*seatina*	*hõbe*
Livonian	^{G}*kūlda*	^{G}*rōda*	^{A}*vašk*	^{G}*tierōda*	^{S}*tinā*	^{La}*svinā*	*õbdõ*
Erzya	^{I}*sį̄rńe*	^{I}*kšńi*	*piže*	^{Ru}*stal´*		*kive*	^{I}*śija*
Moksha	^{I}*śirńə*	^{I}*kšńi*	^{I}*śerəń* ^{I}*śerə̆*	^{Ru}*stal´*		*kivə*	^{I}*śije*
Mari H	^{I}*šörtńö*	^{I}*kürtńö*	^{B}*würγe·ne*	^{T}*wurs*	^{FU}*wulno*	^{FU}*wüδwulno*	^{I}*šij*
Mari M	^{I}*šörtńə̂*	^{I}*kərtńi*	^{B}*wərγeńə*	^{T}*wurs*	^{FU}*wulnə̂*	^{FU}*wəδwulnə̂*	^{I}*ši*
Udmurt	^{I}*zarńi*	^{I}*kort*	^{B}*įrgon*	^{I}*andan*	^{A}*uzveś*	^{A}*śę̄d uzveś*	^{A}*azveś*
Komi	^{I}*zarńi*	^{I}*kę̄rt*	^{B} *įrgę̄n*	^{I}*jemdon*	^{A}*ozį̄ś*	^{Ru}*svińeć*	^{A}*ezį̄ś*
Mansi N	^{I}*sōrńi*	^{I}*kēr*	^{B}*arγin*	^{I}*ēmtan*	^{I}*ānaχ*	^{A}*ātwəs*	^{FU}*śālγoln*
Mansi Ko	^{I}*sarəń*	^{I}*kēr*	^{B}*ärγən*	*ėätėm kēr*		^{A}*óàt¸ws*	^{FU}*óàlen*
			^{I}*tå̄reń*				
Mansi T						*wōlėm*	^{FU}*ålėn*
Khanty Ka	^{I}*sɔ̄rńi*	^{I}*kārti*		^{I}*kārti*		*ētpəŋkārti*	
		^{A}*wŏχ*	^{A}*pătərūχ*	*ētəp*	*ēŋas лŏʌpi*	*лŏʌpi*	^{A}*śēlwŏχ*
Khanty Ni	^{I}*sɔ̄rńə*	^{I}*kārtə*	^{A}*pətərwŏχ*	*ētəp*	*χă̈ntətŏtpə*	*tŏtpə*	^{A}*šoiteŋwŏχ*
Khanty I	^{I}*sōrńə*	^{A}*wă̈χ*	^{A}*wərtəwă̈χ*	^{A}*əntwă̈χ*	^{FU}*χă̈nt ūtən*	^{FU}*ūtən*	^{A}*jəmwă̈χ,*
	sōrńəwă̈χ				*tă̈tpə*	*rūt' tă̈tpə*	*nā̆wə wă̈χ*
Khanty Su	^{I}*sā̆rńį̄*	^{A}*wă̈γ*	^{A}*kă̈ntəγwă̈γ* *лŏrńį̄ wă̈γ*	^{A}*īnʌwă̈γ*	*kă̈ntəγлŏʌpə*	*лŏʌpə*	^{A}*jəmwă̈γ*
Khanty V	^{I}*sărńɜ*	^{A}*wă̈γ*	^{A}*pūtwă̈γ*	^{A}*īnlwă̈γ*	^{FU}*sēr ōlnɜ*	^{FU}*ōlnɜ*	^{A}*jĕmwă̈γ,*
			^{I}*lōrńɜ,*			*ńā̆mk ōlnɜ*	*nā̆γi wă̈γ*
			lōrńəwă̈γ				*sărńəwă̈γ*
Khanty Vj	^{I}*sărńį̄*	^{A}*wă̈χ*	^{I}*jōrńi,*	^{A}*īnlwă̈χ*	^{FU}*nā̆γōlna*	^{FU}*ōlna*	^{A}*nā̆γi wă̈χ*
	wĕrtə sărńį̄		*jōrńiwă̈γ*				*nā̆γi sărńį̄*
Hungarian	^{I}*arany*	^{A}*vas*	^{D}*réz*	*acél*	^{FU}*ón*	^{FU}*ólom*	^{I}*ezüst*

Table 1. Metal names in the Finno-Ugric languages. Raised prefix letters indicate the proposed origin of metal name stems in published sources: ^{G} Germanic, ^{S} Scandinavian, ^{Sw} Swedish, ^{No} Norwegian; ^{I} Iranian; ^{B} Baltic or Iranian; ^{La} Latvian, ^{R} Russian; ^{A} Armenian or Tocharian; ^{T} Turkic; ^{D} Dagestan; ^{FU} Finno-Ugric. Local Finnic, Mordvinic, Mansi, Khanty, or Hungarian names are unmarked.

3. Names of iron

3.1. The proposed etymologies for Finnic **rauta* 'iron' are usually either the Proto-Germanic **rauđa-* (cf. SKES 751a) or **raudan-* (cf. Tette Hofstra 1985: 91 and SSA sub *rauta*). Both reconstructions are based on the Old Norse masculine noun *rauđi* 'marsh ore' whose meaning is most intimately connected with iron. The noun *rauđi* is etymologically related with the Old Norse adjective *rauđr* 'red' and feminine noun *rauđa* 'red color; blood; yolk' (for Old Norse words, cf. de Vries 1962: 434–435). If we want to reconstruct a phonetically and semantically suitable Germanic origin for the Finnic stem, it should be the accusative case form *rauđa* of the word *rauđi*.

For the sake of comparison, Vladimir Terent'ev (1990: 31–32) proposed the Finnic stem **rauta* to be "a Krivich loanword where Slav. *au* had not undergone a change to *u*". Actually, all we know about the language of the Kriviches, the predecessors of the Byelorussians, are certain local variants in so-called Old Russian documents written by Byelorussian scribes. Note that the Old Russian orthography followed the Old Church Slavonic tradition of writing the vowel *u* as *oy*. The Old Church Slavonic (and Armenian) tradition of writing *u* with two letters (this sequence of two characters was considered one letter) followed the example of Greek where the sequence *ov* was pronounced as a diphthong in Ancient Greek but as [*u*] afterwards. In Slavic, the diphthong *ou* is partially retained only in Czech and in Polabian, an extinct West Slavic language spoken in the Elbe (Łaba) River tributary. However, even Czech has the monophthong *u* in this set of stems, cf. *ruda* 'ore' and *rudy* 'red'. Thus the proposed Slavic stem had undergone the change **ou* > *u* at a very early stage. Hence the Finnic stem **rauta* is not a Slavic loanword.

3.2. According to both editions of the Finnish etymological dictionaries SKES and SSA (s.v. *rauta*), the Saamic names for iron are borrowed from Finnish.

3.3. Words denoting 'iron' in Mordvinic, Mari, Permic, Mansi, and the northernmost Khanty dialects are considered Iranian loanwords borrowed from different sources in different times (Joki 1973: 273) and they clearly fall into four subtypes (cf. Table 1, above): (a) disyllabic words ending in *ńV* (Mordvinic, Mari), (b) disyllabic words ending in *i* or *ə* (Khanty), (c) monosyllabic words ending in *rt* (Permic), (d) monosyllabic words ending in *r* (Mansi). In the Mordvinic word denoting 'iron' the former vowel of the initial syllable was lost; occurrence of *š* instead of *rt* makes the stem special among the related stems. The component *ńV* in Mordvinic *kšńi* and Mari *kürtńö*, *kərtńi* may have arisen on the analogy of the words denoting gold. In Mari, the four metal names end in a component *ńV* or *nV* and the vowel *V* follows vowel harmony rules and varies mostly depending on the vowel of the preceding syllable.

The vowel *i* in the Khanty words has certain parallels in Iranian, cf. Avestan *karəti* 'knife'; the vowel *i* or its non-syllabic variant has caused the change

of *t* or *d* to *č*, *š*, or *ž* in certain Iranian and Indo-Aryan languages, such as Shugni *kârč* 'steel' and Baluchi *kārč*, Wakhi *kəžᵵ*. Probably the Mordvinic stem *kšńi* was also borrowed from a source language that had undergone that change. The cluster *rt* is known from Avestan, Sanskrit, Sogdian, and Yaghnobi, whereas most Iranian languages have *rd* instead. Thus, it is possible that *d* is an innovation. Some Iranian languages have dropped the stop from the cluster, e.g. Kurdish *kêr*. Probably the frontness of the vowel in the initial syllable of the Finno-Ugric iron names results from the fact that the vowel *a* attested in several Iranian languages is perceived more as a front vowel by speakers of a language where there is a contrast of *a* and *ä*. Vowel length in Khanty words obviously reflects that in the source language. In most Iranian languages the stem has the meaning 'knife', so e.g. for Ossetic *kard*, Persian *kārd*, Tajik *kord*. It is possible that the semantic shift 'knife' > 'iron' took place in Finno-Ugric languages when the first iron knives and their names were received from Iranian people. On the other hand, the Hungarian word *kard* 'sword' still refers to a special subtype of knives.

3.4. In most Khanty dialects 'iron' is called *wăχ ~ wăγ*, whereas in Hungarian it is *vas*. The history of the Khanty variant is problematic because of the unexplainable spirant *χ ~ γ*. In dictionaries, the Khanty stem is presented also as having the meaning 'metal'. Still it is not clear whether the meaning 'metal' was an extension of the original meaning by native speakers or a scientific generalization obtained after seeing the names of the four metals discussed in this article. The native Khanty classification of the subclasses of iron includes alongside (a) steel (*əntwăχ = īnʌwăγ* 'blade iron') also (b) copper (*pătərūχ ~ pətərwŏχ* 'story iron' or *pūtwăγ* 'pot iron' or *wərtəwăχ* 'red iron' or *kăntəγwăγ* 'Khanty iron'), (c) silver (*śēl wŏχ* 'melt iron' or *šoiteŋwŏx* 'heavy iron' or *jəmwăγ* 'good iron'or *nā̆wə wăχ ~ nā̆γi wăγ* 'white iron'), and in Surgut, Vasjugan, and Vah also (d) gold (*să̮rńį wăγ* 'gold iron'). Still in Khanty the semantic space of 'iron' does not include tin or lead. Hence, *wăχ ~ wăγ* is not a general term for metals but instead the name for one of the three traditional metals alongside gold and lead.

4. Names of steel

Steel was first created as an alloy of iron and carbon in the process of smithing tools or weapons with a sharp edge or blade. The words denoting 'steel' are listed in the fourth column from the left in Table 1 above.

4.1. In Finnic, words denoting 'steel' directly hint at the blade. Livonian *tierōda* is a shortened form of the former compound *tierā/rōda* 'blade iron' In other languages, derivatives of the stem **terä* 'blade' are found.

4.2. The obvious similarity of steel names in Saamic and Mordvinic results from the fact that the name for steel in Russian is a borrowing from Germanic. Here on the basis of the occurrence of palatalized lateral *l*ʹ, the Kildin Saami and Mordvinic names are considered borrowings from Russian, while North and Inari Saami words are considered borrowings from Norwegian. The criterion is somewhat vague, as the front vowel *ää* in Inari Saami comes from earlier **ā* under the influence of the front vowel of the following syllable that probably, temporarily, caused also palatalization of the preceding *l*.

4.3. According to Gordeev. the Mari word for 'steel', *wurs*, Malmyž *wurŭs*, in the 18th century *urs*, is likely borrowed from Old Chuvash, cf. Chuvash *χurśă*, *χurăś* 'steel' (Gordeev 1983: 173). However, this assumption is erroneous, because Chuvash word-initial *χ*- should be reflected as *χ* in Hill Mari and loss (Ø) in Meadow Mari (Räsänen 1920: 21–22), while Mari *w*- corresponds to Chuvash *v*- (op. cit. 54–60).

4.4. Steel names in Permic and North Mansi are usually considered Iranian borrowings (Joki 1973: 249–250). Still, among Iranian languages, the stem occurs only in Ossetic, cf. *ændon* 'steel', and in some Scythian proper names. On the other hand, Abaev (1958: 156–157) brings comparisons from languages of three North Caucasian groups, cf. Ubykh *andān* 'chisel; sharp', Ingush *ondæ*, and Dargin *šandan* 'steel'.

4.5. Kazym and Nizam Khanty words denoting 'steel', *ātəp* and *ētəp*, are derived from the verb stem *āttə*- < Proto-Khanty **ā̈t*- 'to temper' (Honti 1982: 130, number 70).

5. Names of copper

5.1. Saamic copper names go back to Proto-Saamic **vāškē* (< **väśkä*) (according to Lehtiranta 1989: **vēškē*), and Finnic words go back to **vaski* : **vaske* < **vaske*. Problems connected with their background will be discussed in section 6.

5.2. The Erzya name for copper *piže* is based on the semantic extension of the identical color name *piže* 'green'.

5.3. Moksha copper names *śerəń* and *śerä* are connected with the Moksha gold name of Iranian origin, cf. section 2.2.

5.4. For Mari *würγenə*, Udmurt *ɟrgon*, Komi *ɟrgẹn*, Mansi *arγin*, different East-Iranian and Baltic sources have been proposed: (a) Sogdian *uγrani* 'blood' (cf. Joki 1962: 150–153; KÈSKJa 329); (b) Alanian, cf. Ossetic *ärχuə* 'copper' (Trautmann 1910: 458); (c) Baltic, cf. Old Prussian *wargien* 'copper', Lithuanian *vãrias*, *vãris*, Latvian *varš* (Gordeev 1973: 98–100, 1983: 196).

As the Sogdian script, derived from the Aramaic script, was written with consonant letters, the proposed reading *uγrani* of the Sogdian stem written *wγrn-* is problematic. The existence of another Sogdian stem *γwrn-* with the same meaning suggests that one of the stems may be misspelled. In any case, the order of consonants in the proposed donor language differs too much from that in Mari, Permic, and Mansi.

The proposed Alanian origin of the words denoting 'copper' is based on the evidence from Ossetic, the last surviving Northwest Iranian or Scythian language. Ossetic shares several metal names with Finno-Ugric. According to Abaev (1958: 186), the Ossetic word for copper *ärχuə* is of unclear origin. The Ossetic stem has no *n*, so probably Ossetic was not the actual donor. Due to the low first syllable vowel quality, the Konda Mansi stem is the closest to that in Ossetic. Moreover, according to Abaev, the variant *ærχi* occurs in Ossetic as well. In Permic, there are many cases where a former vowel **a* has changed to a high back vowel in inherited Finno-Ugric vocabulary. For Mari such a change is unusual, so probably the Mari word was borrowed from Udmurt, and later its first syllable became associated with the Mari word for blood (Meadow Mari *wür*, Hill Mari *wər*).

Obviously in order to explain the initial *w* in Mari copper names, Fedor Gordeev (1973: 98–100, 1983: 196) has proposed a common protoform **vargene* for the Mari, Permic, and Mansi words and further suggested that it would have been a borrowing from Baltic. cf. Old Prussian *wargien* 'copper', Lithuanian *vãrias*, Latvian *varš*. Vjačeslav Ivanov (1983: 105) connects the Baltic words with Indo-European verbs such as Latvian *vārīt* 'to boil' and Hittite *u̯ar* 'to burn' (cf. also Karulis 1992: 491). Gordeev's etymology is incorrect due to phonological reasons, as (a) there was no reason to drop the initial consonant *v-* in Permic and Mansi and (b) there was no etymological *g* in the Old Prussian copper name (the word *wargien* should be read as [*varjen*], similarly to reading of sequences with *ge* in Baltic German).

5.5. Konda Mansi *tā̆reń*, Vah Khanty *lōrńɜ*, and Vasjugan *jōrńi* come from the Iranian stem for gold, cf. section 2.2.

5.6. Bernát Munkácsi proposed that Hungarian *réz* descends from Avar *rez* 'red copper' (MNyTESz 405). According to Said Hajdakov (1973: 76) the Avar *rez* is not 'copper' but 'brass' similarly to the related stems in other Dagestan languages, cf. Andi *jez* 'brass', Bezhta *iez* 'yellow copper' (i.e. 'brass' or 'chalcopyrite'), Dargin *jaz* 'brass', Tsakhur *jez* 'brass'. In these Dagestan Northeast Caucasian words, the initial consonants together with the following vowel represent petrified word class prefixes. The Avar noun *rez* is unique among the related Dagestan nouns in containing a prefix beginning with *r* and may thus be secondary. On the other hand, the nouns beginning with *j* may well be related with the similar Turkic stem *jez* 'yellow copper' that was attested already in Old Turkic and occurs also in Kumyk, spoken in northwestern Dagestan.

Hartmut Katz (2003: 258–259) postulates a front vocalic source **räu̯ dʰɔḫm* in Early Proto-Aryan as the origin of the Hungarian word. In Aryan, there are also words in which a back vowel occurs, such as Sanskrit *lohá* 'reddish; reddish metal, copper', New Persian *rōd* copper', and front vocalic Greek and German verbs, cf. German *röten* 'to redden'.

Both explanations are highly hypothetical.

6. The background of Finnic **vaski/*vaske-* and Saamic **vā̄škē* 'copper'

Saamic **vā̄škē* and Finnic **vaski ~ *vaske-* are considered etymological cognates with Erzya *uśke* and Moksha *uśkä* 'wire' from Proto-Mordvinic **uśkɜ*, and are found in several other stems not used as copper names, cf. Hill Mari *waž* and Meadow Mari *wož* 'ore' (in compounds), Udmurt *veś* and Komi *i̯ś* in words for tin (and lead) and silver, Tavda Mansi *küš*, West Mansi *weš*, North and Konda Mansi *wes* in compounds for lead, Khanty *waγ* and *waχ* 'iron; metal; money', Hungarian *vas* 'iron', Tundra Nenets *jeśe*, Forest Nenets *ẃeśe* 'iron; money'; Enets *bese* 'iron', Nganasan *básа* 'iron; metal', Kamas *basa, wasa* 'iron', Turukhansk Selkup *kẹzā̄*, Taz, Tym, and Ket Selkup *kwẹzi̯* 'iron', Motor *baze* 'iron'.

6.1. The etymological dictionary of the Uralic languages (UEW 560) gives the words listed above a Uralic protoform **waśke*, in which the stem vowel **e* is reconstructed on the basis of Finnic. Juha Janhunen (1981: 225) has proposed for both Proto-Finno-Permic and Proto-Uralic the front vocalic stem **wäśkä* with the stem vowel **ä* based on the evidence of Saamic and Samoyedic. The sibilant **ś* is evidenced by Permic, North, and Konda Mansi, Hungarian, and Samoyedic data.

The words attested in the Uralic languages have been regarded as borrowings from different Indo-European sources: (a) from Armenian *oski*[3] 'gold' (first suggested by Adolphe Pictet in 1859 (SSA 3: 416)) and (b) from Proto-Tocharian (first suggested by G. S. Lane in 1970 (Joki 1973: 340); Lane also admitted the possibility of borrowing in the opposite direction), cf. Tocharian A *wäs* 'gold' and Tocharian B *yaza* 'gold'.

6.1.1. The Armenian word denoting 'gold' *voski* cannot be the source of the Uralic stem set because Indo-European predecessors of Armenians moved to Armenia only in the 7th century from Asia Minor. According to Vjačeslav Ivanov (1983: 105), the Armenian stem is borrowed, possibly from Urartian, cf. *ušḫu* 'silver' in the related Hurrian. Ivanov's assumption is based on Émile Benveniste's hypothesis on the Hurrian origin of the name of the vessel for producing pure gold in Greek, cf. Greek *ὄβρυζα* and Hurrian *ḫuprušḫi*. The Hurrians are believed to have entered northern Mesopotamia from the Armenian Highlands in around

3. At least in modern Armenian the word is pronounced [*voskʻ*].

2500 BC. Although silver and gold are different enough, it is not clear whether the Armenian and Hurrian words are related to the Sumerian word *guškin* 'gold' mentioned in Joki (1973: 340).

6.1.2. The idea of the possible Tocharian origin of the Proto-Samoyedic stem **wesä* was reconciled by Juha Janhunen (1983: 120–121) for whom "it remained to be solved, whether the Finno-Ugric metal names with an internal *-*k*- could also derive from a Tocharian source".

The Saamic, Finnic, and Mordvinic stems with *k*- as such cannot originate from Tocharian A *wäs* 'gold' and Tocharian B *yaza* 'gold' or Proto-Tocharian **wäsa*. The Tocharian hypothesis was criticized by Petri Kallio (2004: 132–133) and Paul Widmer (2002: 172–174). Vladimir Napol'skikh (2001: 374) accepts it only for Samoyedic **wesä*.

6.1.3. According to Hartmut Katz (2003: 255) the names, except Mari *waž*, go back to Proto-Uralic **wḙ̄śkä* 'copper' and **wə̂śkǻ* whence Finno-Permic **wăśká* and Proto-Samoyedic **wḙ̄śä* **wḙ̄śkä* are considered as nominalized present tense participles of the verb stem **wḙ̄ś́з* 'to shine yellow or red'. As the verb stem **wḙ̄ś́з* is reconstructed on the basis of two Mansi derived verbs and one possible Khanty participle for which no cognates from other Finno-Ugric languages are found, it is a weak argument for the Uralic origin of the name for copper. Moreover, in order to derive the supposed Proto-Permic stem from the Proto-Uralic form, ad hoc sound changes must be postulated both for the vowel of the first syllable and for the following sibilant. Therefore the etymology proposed by Katz cannot be accepted.

6.1.4. Katz (2003: 256) proposed a common protoform with subsequent changes **$h_2$éi̯Hos* > **$h_2$ái̯Hos* > Early Proto-Aryan **$h_2$ái̯əs* > **wā́jas* for a set of Indo-European copper names, such as Sanskrit *áyas*-, Avestan *aiiah*-, Latin *aes*, Gothic *ais* (Pokorny 1959: 15–16) and a set of iron names[4] (e.g. Old Irish *íarn*, Gallian *Isarno*-, cf. Pokorny 1959: 300) and postulated the oblique form *wā́i̯sə* derived from **wā́jas* as the etymological origin of the Mari protoform **wåž* of Hill Mari *waž* and Meadow Mari *wož*. The proposed chain, however, does not explain why the Proto-Indo-European *a*-colored laryngeal *h_2 changed to **w* in Aryan or Iranian.

4. Although the two stem sets share the sounds *i* and *s* and both denote a metal, it hardly means that the sets are etymologically related.

6.2. Actually, the words under discussion exhibit a set of problematic occurrences:

(1) in Saamic, Finnic, and Mordvinic stems the correspondence of stem vowels (i.e. of final vowels of the 2nd syllable) is irregular;
(2) Words denoting 'copper' in Saamic, Finnic, and Mordvinic differ from other Uralic languages because they have a second syllable beginning with a *-k-* that has no corresponding elements in other languages (cf. Table 1, above).
(3) In Khanty, in the semantically corresponding words the spirant γ or χ occurs instead of a sibilant found in other languages.

6.2.1. As an explanation of the second syllable beginning with *k* in Saamic, Finnic, and Mari metal names, occurrence of the derivational suffix **ka* was proposed in Carpelan & Parpola (2001: 127). This proposal must be questioned because of the irregularity of stem vowels attested in contemporary languages. Moreover, it has not been demonstrated why a suffix would occur in the given stem.

6.2.2. On the northwestern coast of Lake Onega in Karelia, in the Volga-Kama region, and in the Urals, copper was smelted from certain minerals approximately in 3000 BP. Obviously somewhere in this region the copper names with the segment *-kV* were once created. Hence we must ask what the segment *-kV* denotes in the Finnic and Saamic copper names. The Finnic reconstruction **vaski* : **vaske-* < **vaśke(-)* 'copper' is reminiscent of the Estonian word for 'mill', namely Estonian *veski* (dial. *veske*), which is etymologically a shortened form of the former compound word for 'water mill' **vesikivi* 'water + stone', cf. also Erzya *ved'gev* 'mill' from **ved'* + *kev* 'water + stone'. So it is conceivable to suppose that also **vaski* is a former compound whose second component was the noun **kivi* : **kive*, copper was received from a mineral, a stone. In all likelihood, all metals were first classified as stones.

As the Finno-Ugric word **kive* is lacking from all Saamic languages, the Saamic stem is probably a Finnic borrowing. When looking for Finnic candidates for the first component of the compound, just two nouns beginning in *vas-* are of interest, namely *vasama* 'arrow (with blunt arrowhead); thunderbolt' (cf. SSA 3: 415), and *vasara* 'hammer; ax' with equivalents in Saamic (**vāčč̄ir*, cf. North Saami *væčir*) and Mordvinic (Erzya *uźeŕ*, Moksha *uźəŕ*) that show that the earlier stem was **vaśara*. The word itself is an Aryan borrowing, cf. e.g. Avestan *vazra-* 'club; pestle', Sanskrit *vajraḥ* 'thunderbolt' (UEW 815–816; SSA 3: 415). Note that although *vasara* is a borrowing and the word *vasama* may be a borrowing, their components *ma* and *ra* in the 3rd syllable were and still are perceived as suffixal, and *vasa-* < **vaśa* is intuitively extracted as a stem. So it is possible that both a mineral containing copper and attracting lightning, and the metallic product of the mineral as a material for making more effective weapons and tools, e.g. hammers and axes could be called **vaśakive* '*vaśa*-stone', which

later was shortened to **vaśki* and **vaśke-*. This stem that is not attested as an independent word any longer is identical with the Indo-European stem **vaśa*, reconstructed by Asko Parpola (Carpelan & Parpola 2001: 127):

> If Proto-Uralic **wäśkä* 'metal' ends in a Uralic suffix **ka*/*kä*, Proto-Aryan and Old Indo-Aryan *vā́śī* 'bronze axe or adze' (as a *vṛddhi* derivative from **vaśa* '*bronze') might be related to it.

What remains problematic is the original meaning of the Indo-European stem. The data presented by Alexander Lubotzky (2001: 312) contain no hint to bronze:

> **u̯aćī*-f. 'axe, pointed knife': Skt. *vā́śī* f. 'axe, adze, chisel'; LAv. (Yasna 42.4) *vāsī* 'pointed knife (?)', Oss. *wæs* (better *was* ?) 'axe, wood-chopper'.

It must be assumed that axes, adzes, and chisels are older than bronze and have preserved their former names even when made of bronze. Moreover it is improbable that names for 'thunderbolt', such as Sanskrit *vajraḥ* and Finnic **vasama* were derived from a metal name.

Alongside the Indo-Aryan stem there exists a somewhat similar and simpler metal name in Circassian (Northwest Caucasian) languages. In the Circassian languages, certain metal names are composed by means of the stem $\gamma^{w}a \sim \gamma^{w}e \sim \gamma^{w}ə$, which may be related with $\gamma^{w}e$ 'yellow, red'. In the extinct Ubykh, spoken first on the northeastern coast of the Black Sea, and last in Turkey after the Russian invasion, there are several metal names such as $wəs^{w}e$ 'copper' and $wəç^{w}e$ 'iron' in which the former γ^{w} was changed to *w*, cf. also $s^{w}e$ 'bright' and $ç^{w}e$ 'grey' (Šagirov 1977: 131–132). In other Circassian languages the initial consonant γ^{w} is retained and the attributive component of word for copper is *pl'ə* 'red'). So, it can be asked whether the Aryan and Northwest Caucasian stems are related.

The borrowed protoform **vaśa* in the Uralic languages allows us to explain all later stem variants with front vowels as resulting from the assimilative influence of the palatalized sibilant **ś* and all stem variants with the sibilant *š* or *ž* as developments of **ś*. The occurrence of the spirant *χ* or *γ* in Khanty names can be explained by alleging that the metal name was borrowed either from an Iranian dialect where the sibilant had undergone the Iranian local change **ś* > **h* in 1000–1500 BC or from a Dagestan language, cf. Avar *baχ* ~ *paχ* 'copper', Chamalal, Hunzib *baχ* 'copper', Bezhta *bak* 'copper'.

7. Changes in the semantic system of words denoting 'copper', 'gold', and 'iron'

The somewhat irregular system of related stems in names of different metals in Finno-Ugric languages gets an explanation if we suppose that the relationship between different meanings was reorganized and semantic shifts took place between the metal names.

The rise of an unknown metal name or a semantic shift in a given language can be defined as a new (micro)stage in the history of a language. Assuming that copper was the first metal that the early Finno-Ugrians came to know, and the two layers of words denoting 'gold' discussed in section 2 are correct, there are altogether 10 stages in the history of 'copper', 'gold' and 'iron' that can be singled out as follows: Copper 1, Copper 2, Copper 3; Gold 1, Gold 2; Iron 1; Wire / Ore / Metal.

It was found that the 10 stages form 19 ordered pairs of the possible 45 pairs are strictly ordered, namely: {Copper 1, Copper 2}, {Copper 1, Copper 3}, {Copper 1, Iron 1}, {Copper 1, Iron 2}, {Copper 1, Wire}, {Copper 1, Ore}, {Copper 1, Metal}; {Copper 2, Copper 3}; {Copper 3, Gold 2}; {Gold 1, Copper 3}, {Gold 1, Gold 2}; {Iron 1, Copper 2}, {Iron 1, Iron 2}; {Wire, Copper 2}, {Wire, Copper 3}; {Ore, Copper 2}, {Ore, Copper 3}; {Metal, Copper 2}, and {Metal, Copper 3}. The stages Iron 1, Wire, Ore, and Metal are complementary. For the sake of comparability as to Iron 2, Iron 1 is presented in a column of its own; Wire, Ore, and Metal are presented together in a single column. As the number of strictly ordered pairs of stages is modest, it is possible to build several formally correct tables. Table 2 is one such table. It must be noted that Copper 1 and Gold 1 are not strictly ordered. Hence words for copper cannot be proven to be older than gold names, and vice versa. Copper 2, which reflects copper names as a subclass of iron, cf. section 3.4, is partially a stage of indefinite length and even intersects the Copper 3 stage in Vasjugan where the compound *pūtwaγ* 'pot iron' probably occurs later than the word *lōrńɜ* 'copper'.

	Copper 1	Iron 1	Wire / Ore / Metal	Copper 2	Iron 2	Gold 1	Copper 3	Gold 2
Saamic	① **vā̆śkä*	**rōvte*				**kollē*		
Finnic	② **vaske-*	**rauta*				**kulta*		
Md	③ **uśka* ↗		↘③ **uśka*		*① kšńi*	❶ **serəń* ↗	↘❶ *śerəń*	❶ *sirńe*
Mari	④ **waž* ↗		↘④ *waž*		*② kürtńö*		1 *würγene*	❷ *šörtńö*
Komi	⑤ *-i̯ś* ↗		↘⑤ *-i̯ś*		*③ kẹ̄rt*		2 *i̯rgon*	❸ *zarńi*
Ud	⑥ *-veś* ↗		↘⑥ *-veś*		*③ kort*		2 *i̯rgẹ̄n*	❸ *zarńi*
MnSo	⑥ *-wəs* ↗		↘⑥ *-wəs*		*④ kēr*		3 *arγin*	❹ *sōrńi*
MnKo	?				*④ kēr*	❷ *tå̄reń* ↗	↘❷ *tå̄reń*	❺ *sarəń*
MnP	?				?	❸ *tariń* ↗	↘❸ *tariń*	?
KhaKa	⑦ *wŏχ* ↗	↘⑦ *wŏχ*		*pătərūχ*	*kārti*			❹ *sɔ̄rńi*
KhaNi	⑦ *wŏχ* ↗	↘⑦ (*wŏχ*)		*pətərwŏχ*	*kārtə*			❹ *sōrńə*
KhaI	⑦ *wă̆χ* ↗	↘⑦ *wă̆χ*		*wərtəwă̆χ*				?
KhaSu	⑦ *wă̆γ* ↗	↘⑦ *wă̆γ*		*kă̆ntəγwă̆γ*		❹ *лŏrńi̯* ↗	↘❹ *лŏrńə-*	❹ *så̄rńi̯*
KhaV	⑦ *wă̆γ* ↗	↘⑦ *wă̆γ*		*pūtwă̆γ*		❹ *lōrńɜ* ↗	↘❹ *lōrńɜ*	❹ *să̆rńɜ*
KhaVj	⑦ *wă̆χ* ↗	↘⑦ *wă̆χ*				❹ *jōrńi* ↗	↘❹ *jōrńi*	?
Hu	⑧ *vas* ↗	↘⑧ *vas*				❺ *arany*	*réz*	

Table 2. The mutual relationship between metal names in Finno-Ugric languages.

Abbreviations

KhaI	Irtyš Khanty	Md	Mordvin
KhaKa	Kazym Khanty	MnKo	Konda Mansi
KhaNi	Nizjam Khanty	MnP	Pelym Mansi
KhaSu	Surgut Khanty	MnSo	Sos'va Mansi
KhaV	Vah Khanty	Oss.	Ossetic
KhaVj	Vasjugan Khanty	Skt.	Sanskrit
Hu	Hungarian	Ud	Udmurt
LAv.	Late Avestan		

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