

Wheel and chariot in early IE: What exactly can we conclude from the linguistic data?

*Babies, bathwaters, wheels, and chariots:
Assessing the impact of David Anthony's work
on European and Eurasian steppe prehistory*

EAA Bern 2019

1. Preliminaries and Introduction

Protolanguages = ancestors of language families
reconstructed from daughter languages

PIE = Proto-Indo-European = ancestor of all branches except Anatolian

PIA = Proto-Indo-Anatolian = ancestor of Proto-Anatolian and PIE

PIIr. = Proto-Indo-Iranic

etc.

Family tree with first split of Anatolian taken for granted
(even if not completely undisputed)

Notational differences for sounds: esp. $*\chi = *h_2$

1. Preliminaries and Introduction

“Linguistic Archaeology” (or “Archaeological linguistics”?)

“Linguistic palaeontology” / “Wörter und Sachen”

Linguistic reconstruction > words of reconstructed (proto-)languages

Words = reference to things

Existence of words = knowledge of things referred to

Mallory 1989; Mallory & Adams 1997; Anthony 2007; Anthony & Ringe 2015

Skeptical: Renfrew 1987; Clackson 2013; Heggarty & Renfrew 2014; Heggarty 2015

2. Linguistic reconstruction

Formal reconstruction

rigorous, based on established sound correspondences (“sound laws”) and grammatical rules

matching items in two related languages must go back to common ancestor = protolanguage and can be reconstructed for it

E.g., Skt. *áśva-s* = Latin *equo-s* = Gothic *aiwa-* = Tocharian B *yakwe* ...
< PIE **hékwo-s* ‘horse’

Skt. *yugá-m* = Greek *zugó-n* = Latin *iugu-m* = Gothic *juk* ...
< PIE **jugó-m* / **jug^wó-m* ‘yoke’

2. Linguistic reconstruction

Semantic reconstruction

Much less rigorous (no “laws”)

Trivial changes (= parallel change)

e.g., wild > domesticated, common metaphors

PIE **hékwo-* (PIA **hékū-*) ‘wild horse’ > ‘domesticated horse’
(or even other equids, cf. Armenian *ēš* ‘donkey’)

Spread of semantic innovations (borrowing, contact)

very easy within a communicative network

(words still identifiable as cognate)

3. Data: Early IE words for 'wheel'

1) PIA **χwerg-* 'to turn (around)'

→ **χwrg-i-* > Hittite *hurki-* c. 'wheel'

no other words from this root

words in other Anatolian languages unknown

→ PToch. **wark-want-* > Toch. *wärkänt* 'wheel'

→ **w^yerkwanto* > B *yerkwanto* 'wheel' (cf. also *yerter* 'wheelrim, felloe')

verb still exists in Tocharian

Independent formations

No words for 'wheel' from this root in other branches

Distribution of *χwrg-i- / *χwrg-(w)nt- ‘wheel’

	Germ		Balt				
Celt			Slav		Iran		Toch
		Alb					
	Ital	Mess	Greek	Phryg	Arm		Nur
				Anat		Ind	

Distribution of *χwrg-i- / *χwrg-(w)nt- ‘wheel’

	N		W	E			
Celt	W	E	W	E	Iran		Toch
		Alb	S				
	Lat	Mess	Greek	Phryg	Arm		Nur
	Sab			Luwic	Hittite	Ind	

3. Data: 3.1 Early IE words for 'wheel'

2) PIA $*k^w el(h)$ - 'to turn around, roll; walk around, graze'

→ PIE $*k^w é-k^w lo$ - ~ $*k^w (e)-k^w ló$ - 'turning (repeatedly)' m./n.

probably originally $*k^w é-k^w lo$ - m. with collective $*k^w ə-k^w láχ$ - n.

Indo-Iranic $*k^w ek^w ló$ - > $*kekló$ - > $*kekró$ - > PIIr. $*kakra$ - >

Skt. *cakrá*- m. n. 'wheel; circle, cycle', pl. also 'wheeled vehicle';

Avestan *caxra*- 'wheel', later Iranian also 'circle; sphere, sky; bow' etc.

Greek $*k^w ák^w lo$ - > *kúklos* m. 'circle, wheel', *kúkla* n. pl. 'wheeled vehicle'

Germanic $*k^w ék^w lo$ - ~ $*k^w ek^w ló$ - > PGerm. $*h^w eh^w la$ - ~ $*h^w egl$ a- / $*h^w eul$ a- n.

> ON *hiól* ~ *hvél*; OE *hweohhol*/*hwēol*/*hweogol*; OF **hwial* / *hwēl*

3.1 Early IE words for 'wheel'

Tocharian **k^wək^wlo-* > PT **k^wək^w(ə)læ* m. 'wagon' > A *kukäl*, B *kok(a)le*

Cf. also **k^wok^wló-* (?) 'turner' > Lithuanian *kãklas* m. 'neck'

Archaic, non-productive word-formation with reduplication

'turning again and again' = 'rolling'

Cf. PIE (PIA?) **b^heb^hr-(o/u)-* 'beaver' ('bearing around?')

**te-tr-* 'capercaillie; grouse'

3.1 Early IE words for 'wheel'

Other derivatives of **k^wel-* with productive formation types

→ **k^wél(h)o(s)-* 'turning' > Old Prussian *kelan* n.

?PGerm. **h^wela-* > ON *hvel* n. (doubtful, Kroonen 2013: 265)

But Welsh *pel* 'ball'

→ **k^wol(h)o-* m. 'turning' > Dual (?) PCelt. **k^wolū* > Old Irish *cul* 'chariot'

x **k^wél(h)os-* n. > PSlav. **kolo, koles-* 'wheel; wheeled vehicle'

But Greek *pólos* 'axis, pole, sphere'; Toch. B *kele* 'navel; mid, centre'

Derivation from reduplicated **k^wk^w-l-* has been proposed but remains insecure

3.1 Early IE words for ‘wheel’

Early loans in Western Uralic: not ‘wheel’, but ‘round, curve, circle, ring’

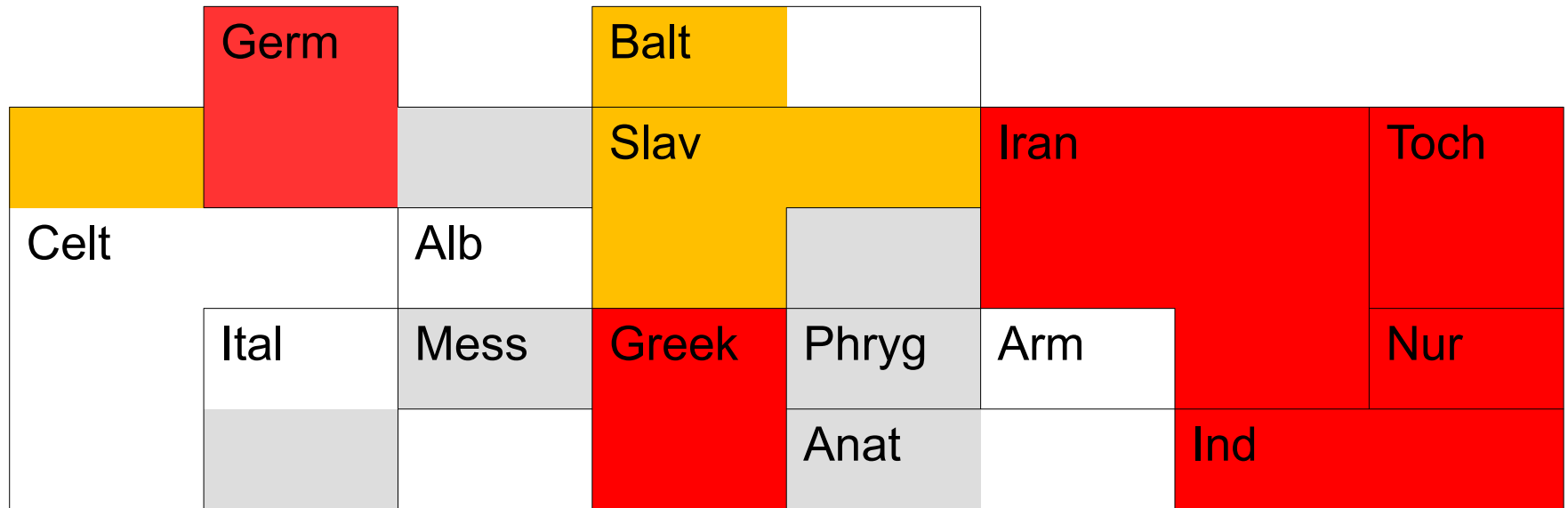
IE/Pre-PIIr. **keklo-* → WU **keklä* ‘round, ring’ > Saamic **keawlē* ‘arch, bow, circle, ring, curved’ (Koivulehto 2000; → Finn. *käylä*)

Pre-PIIr. **kekro-* → WU **kekrä* ‘round, ring’ > Saamic **keawrē* ‘circle, ring; round thing’ (Koivulehto 2000; → Finn. *käyrä*)

**kekrä-j* > Finn. *kekri* ‘yearly celebration’ (Koivulehto 2000)

‘Wheel’ > ‘circle, ring’ or vice versa? Depends on basic meaning: ‘turn’ or ‘being round’; word formation with reduplication makes more sense with ‘to turn’; meaning ‘wheel’ replaced by later loans?

Distribution of **k^wek^wlo-* ‘wheel’ / ‘wheeled vehicle’
**k^wel(h)o-*, **k^wol(h)o-* ‘wheel’ / ‘wheeled vehicle’



3.1 Early IE words for ‘wheel’

3) **ret-* ‘to run’ ⇒ **róto-* ‘running’,

(⇒) collective/abstract **rotáχ-* (accent?) >

**róto-* > PGerm. **rapa-* n. > OF *reth*, OS *rath*, OHG *rad*

(cf. **rotó-* > PGerm. **rada-* ‘fast’ > Gothic *raþs*, OE *ræd*)

**róto-* > Lithuanian *rãtas*, Latvian *rats* ‘wheel, circle, ring’, pl. ‘wheeled vehicle’; ↗ Finnic **ratas* ‘wheel’

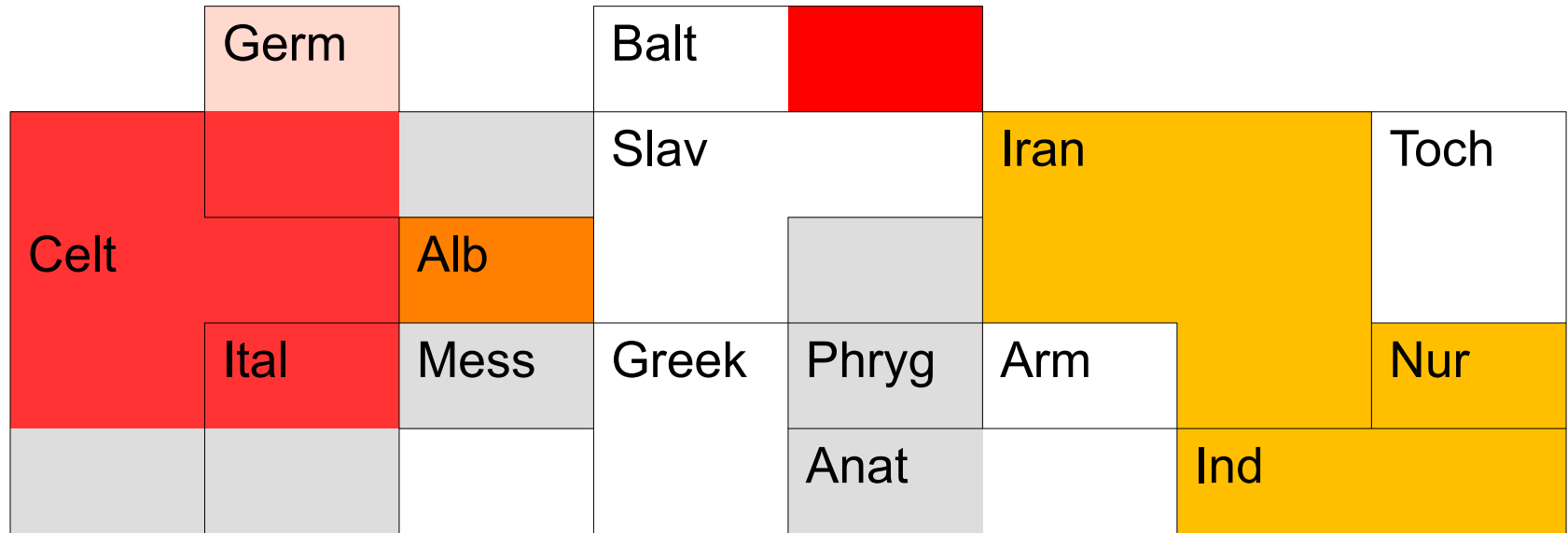
PCelt. **roto-* > Old Irish *roth* m. ‘wheel, disc’; **rotā-* > Middle Welsh *rot*

**rotā-* > Latin *rota* f. (↗ Albanian *rrotë* f.)

⇒ **rótx-o-* > Ir. **rátha-* m. ‘vehicle?, chariot’ ⇒ **rathí-* ‘charioteer’

**rotχ-iH-* > Albanian *rreth* (pl. *rrathë*) ‘rim, ring’ (Stifter 2008: 283)

Distribution of **roto-*, **rotax-* ‘wheel’ / **rotχ-o-* ‘chariot’, **rotχ-iH-* ‘rim’



3.1 Early IE words for ‘wheel’

**k^wek^wlo-* = ‘disc wheel’ vs. **róto-* = innovative ‘spoked wheel’?

Meringer 1908; Putschke 1980; Holm 2017

Distinction not actually attested anywhere
no common terms for ‘spoke’!

Indo-Iranic **kákrá-* ‘wheel; wheeled vehicle’ vs. **rátha-* ‘chariot’

Germanic: North Frisian Sylt *weel* ‘wheel, spinning wheel, bicycle’
vs. (loanword?) *rad* ‘wheel; bicycle’

East Frisian (Saterland) *jool* ‘wheel (wagon)’ + *wäil* ‘spinning wheel’
vs. *rääd* ‘(small) wheel; bicycle’

Dutch *rad* ‘(special) wheel’ + *wiel* ‘wheel (general, vehicle)’

3.1 Early IE words for 'wheel'

4) Greek *trochós* 'runner' > 'wheel'

5) Armenian *aniw* < **bnēb^ho-* 'having a nave'

No derivatives of **wert-* 'to turn', **wel-* 'to turn'

3.1 Early IE words for 'wheel'

Conclusions:

Common selection of just few roots with appropriate semantics

Non-trivial word formation in $*k^w(e)k^wlo-$

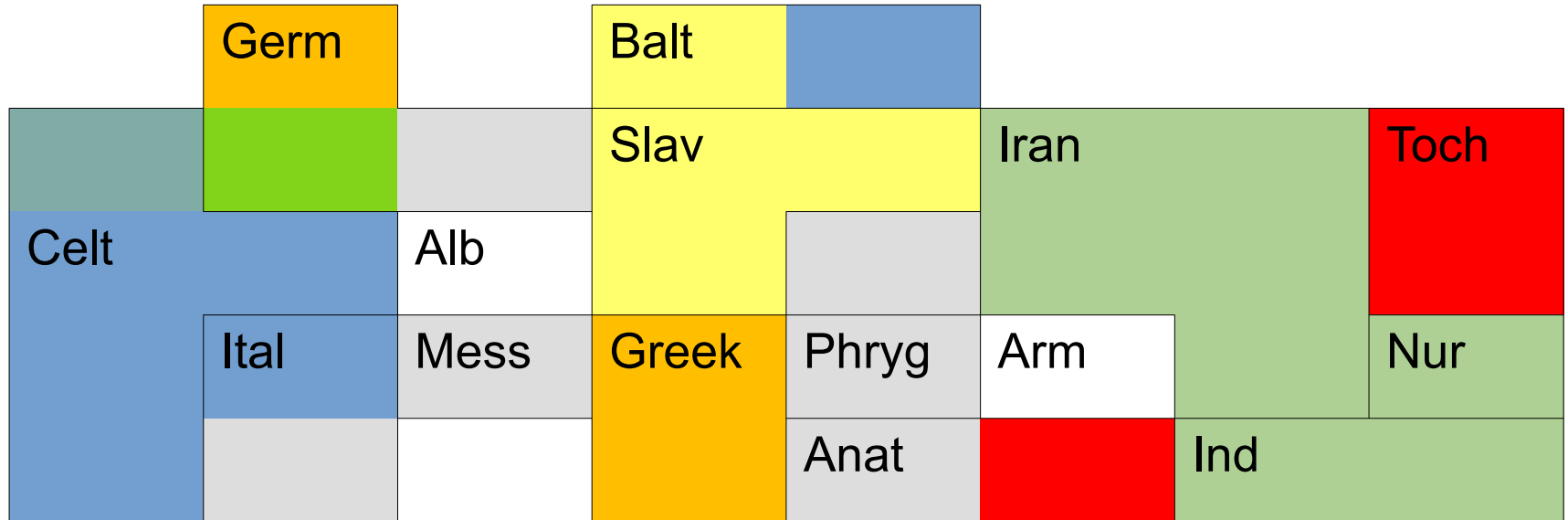
Presupposes at least: intact communicative network

still very similar language varieties (no formal evidence for borrowings)

PIE, no evidence for PIA date

Distribution of early IE words for 'wheel'

* χ wrg-, * k^w ek w lo-, * k^w el-, *roto-/rotax-



3. Data: Early IE words for 'axle'

IE words for 'axle'

* $\chi\acute{a}k$ -s- → *-o- > Skt. *ákṣa*- m. 'axle; collar-bone'

→ *-on- > Greek *áksōn* m.

→ *-aχ- > PGerm. **ahsō*- f.; **ahsula*- m.

(beside **ahslō*- 'shoulder')

→ *-(i)- > Lat. *axis* f.; Middle Irish *ais* f.; Lith. *ašis* f., CSlav. **osъ* f.

Derivation not transparent, unclear

from **χαḡ*- 'to drive'

or from **χακ*- 'sharp, pointed'?

3. Data: Early IE words for 'axle'

Connection to words for 'shoulder, armpit'

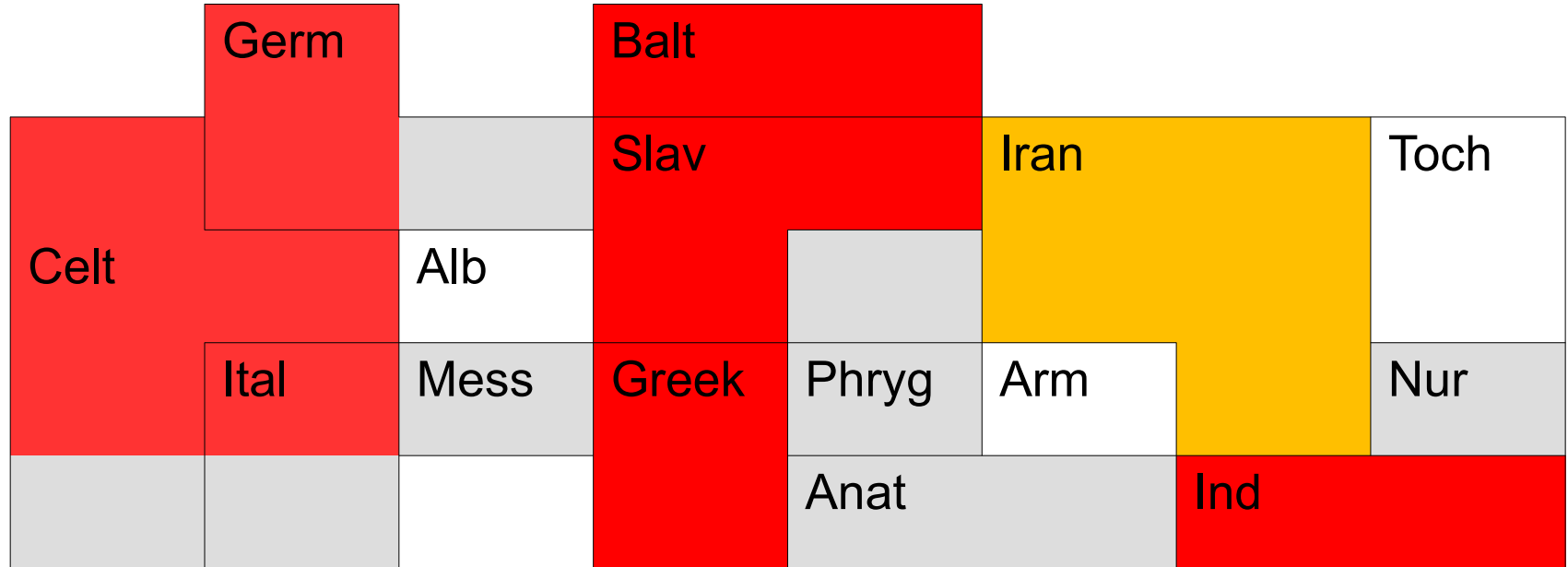
cf. Skt. meaning 'collar-bone'

Cf. Avestan *aša-* 'armpit'

Latin *āla* < **aks(i)lā-* 'armpit, wing', cf. dimin. *axilla* 'armpit'

PGerm. **ahslō-* f.

Distribution of *χaks- ‘axle’ / ‘armpit’



3. Data: Early IE words for 'wheeled vehicle'

1) 'wheel' > 'wagon' (cf. above)

**k^wék^wlo-*, **k^w(e)k^wló-* > PToch. **k^wək^wəlæ* 'wheeled vehicle'

**rót(a)χ-* '(set of) wheels' → **rótχ-o-* 'having (a set of) wheels'

> PIr. **rátha-* '(vehicle >) chariot' > Skt. *rátha-*, Avestan *raθa-* 'chariot'

2) **weg^h-* 'to transport, drive' ⇒ some derivative 'wheeled vehicle'

**wog^hno-* > PGerm. **wagna-* (→ Finnic)

**weg^hno-* > PCelt. **wegno-* > *fén*, *gwein*

**wóg^ho-* > Greek *óchos*; CSlav. **wozъ*

**wég^hi-* > Lat. *uehis*, *uehiculum*

3. Data: Early IE words for ‘wheeled vehicle’

3) Others

**jaχ-* ‘to go, drive’ ⇒ Skt. *yāna-* n. ‘vehicle’

Hénos* (ḅános-*?) ‘burden’ > Skt. *ánas-* ‘cart’; cf. Latin *onus* ‘burden’

**wert-* ‘to turn’ (?) → Proto-Iranic **wárta-*

> Avestan *vāša-* ‘wheeled vehicle’, later also **wartana-* > Sogd. *wrtn* etc.

**kers-* ‘to run’ ⇒ **kṛso-* > (Umbrian ↷) Lat. *currus*, Celtic **karso-* (↷ Arm.)

**(χ)ar-smṇ* ‘fitted together’ > Greek *hárma* (Myc. *a-mo*)

Hittite loanword *huluganni-* ‘chariot’

No general PIE term except collectives of ‘wheel’

3. Data: Pre-wheel traction terminology

‘Yoke’ : PIA **jeug^w-*, **jug^w(o)-* > Hittite *iūk*, *iugan*

PIE **jug^wó-* > Skt. *yugá-*, Greek *zugón*, Latin *iugum* etc.

‘Pole, thill, shaft’: PIA **χ(o)jH-(e)s-*, **χιHs-άχ-* ‘pole’

**χιHsάχ-* > Hittite *hissa-* ‘pole, thill?’; Skt. *īṣā-* ‘pole, thill?’

**χojH-(e)s-* > Avestan *aēš(a)-* ‘pole of plough’

Proto-Slavic **ajes-* > Slovenian *oje* ‘pole, thill’ etc.

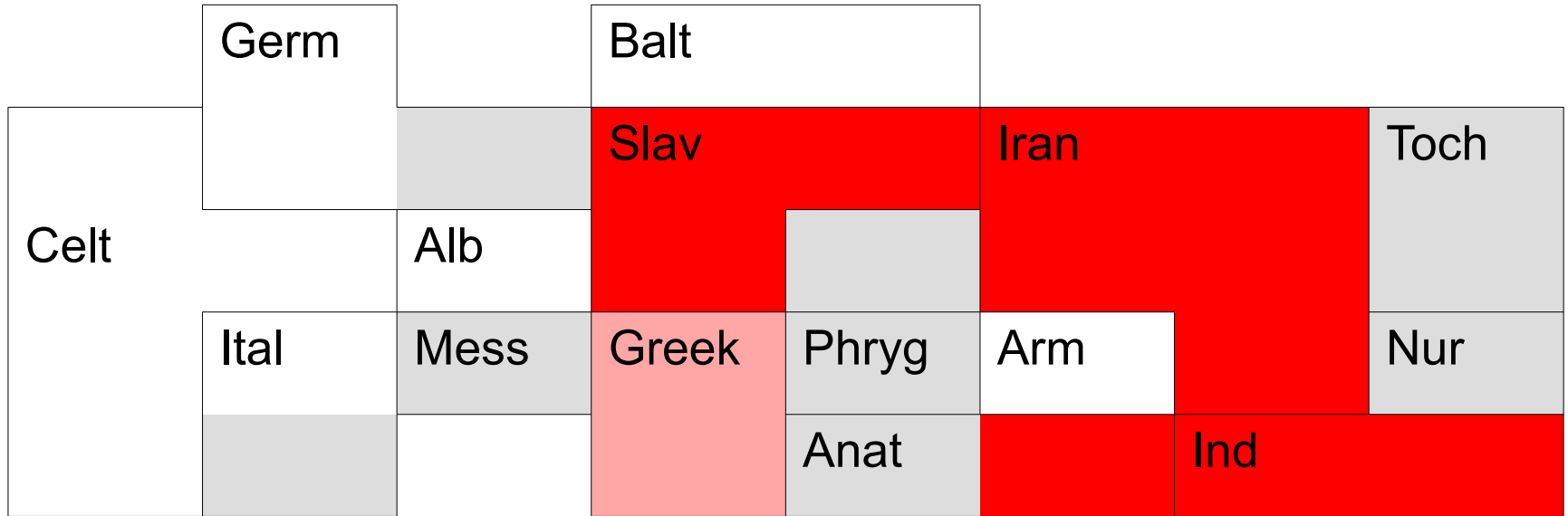
Greek derivative *oiāks*, *oiéion* ‘handle’

Attestation includes Anatolian > already PIA

Distribution of **j(e)ug^{w-}*, *jug^{wó-}* ‘yoke’



Distribution of *χojH-es-, *χiHs-(aχ)- ‘pole, shaft, thill’



4. General conclusions

- IE terminology for wheeled vehicles shows non-trivial common lexicon presupposes either PIE date or persisting post-PIE communicative network (before loss of contact with first branch, viz. Tocharian) with very little difference of dialects
- No such evidence for PIA date supports Anatolian splitoff before invention of wheel
- Good evidence for common traction terminology in pre-wheel stage of development

Thanks for your attention!

References

- Anthony, David 2007. *The horse, the wheel, and language: How Bronze-age riders from the Eurasian steppes shaped the modern world*. Princeton: Princeton University Press.
- Anthony, David & Ringe, Don. 2015. The Indo-European homeland from linguistic and archaeological perspectives. *Annual Review of Linguistics* 2015.1, 199-219.
- Clackson, James. 2013. Clackson, J. The origins of the Indic languages: the Indo-European model. in *Perspectives on the Origin of Indian Civilization* (eds. Marcantonio, A. & Jha, G. N.) 259–287 (D.K. Printworld, 2013).
- Garrett, Andrew. 2006. Convergence in the formation of the Indo-European subgroups: Phylogeny and chronology. In: Peter Forster, Colin Renfrew (eds.), *Phylogenetic methods and the prehistory of languages*. Cambridge: McDonald Institute for Archaeological Research, 139-151.
- Heggarty, Paul. 2015. “Prehistory through Language and Archaeology,” in *The Routledge Handbook of Historical Linguistics*, eds. Claire Bower and Bethwyn Evans. London: Routledge, 598–626.
- Heggarty, Paul & Colin Renfrew 2014: South and Island Southeast Asia: Languages. *The Cambridge World Prehistory*. Ed. by Colin Renfrew & Paul Bahn. Cambridge: Cambridge University Press. 534–558.

References

- Holm, Hans J. 2017. Steppe homeland of Indo-Europeans favored by a Bayesian approach with revised data and processing. *Glottometrics* 37, 54-81.
- Koivulehto, Jorma. 2000. Fest und Zyklus des Jahres: *Jul* und *Kekri*. *Neuphilologische Mitteilungen* 101: 235–252.
- Kroonen, Guus. 2013. *Etymological Dictionary of Proto-Germanic*. Leiden / Boston: Brill.
- Mallory, James P. 1989. *In Search of the Indo-Europeans: Language, Archaeology and Myth*. London: Thames & Hudson.
- Mallory, James P. & Adams, Douglas Q. (eds.). 1997. *Encyclopedia of Indo-European culture*. London / Chicago: Fitzroy Dearburn.
- Putschke, Wolfgang. 1980. Ansätze zu einer indogermanischen Wortgeographie des Wagens. In: J. Kruijsen (Hrsg.), *Liber Amicorum Weijnen. Een bundel opstellen aangeboden aan Prof. Dr. A. Weijnen bij zijn zeventigste verjaardag*. Assen, 337-351.
- Renfrew, Colin. 1987. *Archaeology and Language: The Puzzle of Indo-European Origins*. London: Cape.
- Stifter, David. 2008. Old Prussian *kellewesze* 'Driver of a Cart'. *Historische Sprachforschung* 121, 280-295.
- Watkins, Calvert. 1995. *How to Kill a Dragon: Aspects of Indo-European Poetics*. Oxford: Oxford University Press.