Sasha Nikolaev
University of Cyprus
nikolaev.alexander@ucy.ac.cy

Greek χελώνη and Laryngeal Breaking

1. "Laryngeal Breaking" (= LB): the term proposed by Olsen 2004 (2009) for the alleged development *UH to a sequence "glide+long vowel" in Greek.

1.1 Francis (1970: 276–284):

> Gk. ζωός 'alive' < *$g^{w}ih_3$-u̯ó- (cf. Ved. *jīvá-*, Lat. *vīvus,* Lith. *gývas*, Slav. **živъ*, etc.)
>
> Gk. ζώω 'live' < *$g^{w}ih_3$-u̯e/o-* (cf. Ved. *jī́vā-^{mi}*, Lat. *vīvō*, Slav. **živǫ*)

A special sound law: *ih_3 > *i̯ō*, rather than "State-II" full grades *g^{w}i̯eh$_3$-u̯ó-*, *g^{w}i̯eh$_3$-u̯e/o-*.

1.2 Cowgill *apud* Francis:

> Gk. πρόσωπον 'face' < *proti-h_3k^{w}-o-* (cf. Ved. *prátīkam* 'id.'; later Toch. B *pratsāko* 'breast' was added to this equation, but "breaking" *$Uh_{2/3}$ > U̯a in Tocharian does not have to be related to the Greek development).

1.3 Same development was argued for *uh_2*:

> δηρός 'long(-lasting)' < *duh$_2$-ró-* (cf. Ved. *dūrá-* 'distant'; later Arm. *erkar* 'long' was added (< *duh$_2$-ró-* / *du̯eh$_2$-ró-*), but it is unclear whether "breaking" has to be assumed for Armenian, see Clackson 1994: 41–49; Kölligan 2019: 105–106 n. 288).

1.4 Normier (1977: 182 n. 26) added more examples but also argued that this sound change in Greek did not apply to the sequences of semivowel followed by *h_1*:

> opt. εἶμεν 'may we be' < *h_1s-ih_1-mes*
>
> εἴκοσι / (ϝ)ῑ́κατι '20' < *(e)u̯īkəti* < *du̯i-$h_1$km̥ti*, etc.

*$Uh_{2/3}$ > *U̯ā/ō* has been known as "Francis–Normier Law" (so referred to by Rasmussen 1991 who added more examples and sought to provide a phonetic justification).

1.5 Peters (1988: 376) refuted this law on the strength of such counterexamples as θῡμός 'soul, breath' < *d^{h}uh$_2$-mo-*, βρῑ́θω 'I am heavy' < *g^{w}rih$_2d^{h}$-*, πῖθι 'drink!' < *pih$_3$-d^{h}i*, κῑ́νυμαι 'I move' < *kih$_2$-neu̯-* (but this is prob. metrically lengthened *ki-ne-u̯-*, see Nikolaev [*to appear*]).

1.6 Indeed, thanks to the veritable revolution in our understanding of PIE inflectional and derivational morphology that took place in the last decades, we are now able to motivate "extra" full grades like *du̯eh$_2$-ró-* > δηρός in ways, impossible for the earlier scholarship. (See for instance, Vine 2002a on Att. ἐρωτάω; 2002b: 340–342 on δηρός; 2004: 363-4 on ζᾱτός).

1.7 Olsen 2004 (2009) made an important contribution to the debate by proposing a **<u>conditioned</u>** development of the sequence *$UH_{2/3}$:

> <u>accented</u> *$ÚH_{2/3}$ gave Proto-Greek *$\bar{\imath}$* and *$\bar{u}$*
>
> <u>unaccented</u> *$UH_{2/3}$ underwent "breaking" and developed to Proto-Greek *i̯ā*, *i̯ō*, *u̯ā*, *u̯ō*.

Olsen's corollary immediately invalidates such counterexamples as πῖθι < **píh₃-dʰi*.

This is a very clever solution, and it is not entirely clear why Olsen's theory has never received a proper scholarly response.

2. A proper assessment of this proposal would have to include

a) a critical discussion of counterexamples to LB (with Olsen's corollary)

b) a critical discussion of examples marshalled in favor of LB (with Olsen's corollary)

Especially (a) is very difficult, since accent shift and/or analogical spread of accented allomorph are always a possibility.

2.1 An additional difficulty: for θῡμός 'breath, soul' vis-à-vis Ved. *dhūmá-*, Hitt. *tuḫḫuī-* (NH *tuḫḫuwāi-*) 'smoke', *tuḫḫai-* 'to smoke' there is now the Hyllested–Cohen rule of monophthongization of *u*-diphthong before labial consonant in Greek: **dʰou̯(h₂)-mó-* > **tʰou̯-mó-* > **tʰū-mó-*. For this sound law see now Kristoffersen 2019, whose main examples are listed in **Appendix 1**. Very dubious but requires full discussion which cannot be accommodated here.

**dʰuh₂-* has the trappings of a "zero-grade root" anyway, see Vine 2022.

θῡμός ≠ Hitt. *tuḫḫima-* 'wheeze', an inner-Hittite coinage. Even though **dʰuh₂imó-* would have given **tʰuimó-* > **tʰūmó-*, cf. δείκνῡ < **-nu-i*, opt. δαινῦτο < **-nu-ī́-* (Sergio Neri, p.c.), this reconstruction is inferior to **dʰuh₂-mó-* (so also Neri).

2.2 For a preliminary (and incomplete) list of possible counterexamples to LB see **Appendix 2**.

2.3 For a preliminary (and incomplete) list of some examples marshalled in support of LB with alternative derivations see **Appendix 3**.

2.4 A full discussion of these cases would require many hours / pages.

3. Today's case: χελώνη 'tortoise, sea-turtle' (Olsen 2004 (2009): 356–357).
Other relevant forms: χέλυς, -υος 'tortoise, sea-turtle' (by metonymy 'lyre') and χελῡ́νη 'id.'.

I withhold judgment on whether χέλυμνα (Babrius 115.5) goes back to **kʰeluu̯-nă̄*. The form is used by an eagle, addressing a tortoise, and some sort of word play cannot be excluded.

3.1 Olsen's preforms:

a) χελώνη < **gʰéluh₃-h₃n(h₂)-eh₂-* (Hoffmann-derivative, in Copenhagen reconstruction; LB in an unaccented syllable, then accent movement due to the Law of Limitation)

b) χελῡ́νη < **gʰelúh₃-neh₂-*

Olsen does not mention Aeolic χελύννᾱ (Sappho 58c2, 58b.11 Neri) which appears (!) to suggest Proto-Greek **kʰeluhnā-* > Ionic χελῡ́νη with the long vowel due to 1st CL.

3.1.1 Semantic problem with (a): the expected meaning is exocentric 'possessing / enclosing tortoise' which seems difficult: χελώνη means the <u>exact</u> same thing as the presumed base word χέλυς and as χελῡ́νη.

(The meaning ‘tortoise shell’ = ‘sounding chamber of the lyre’ only appears in Plut. *Mor.* 1030b and does not provide sufficient evidence for an exocentric meaning of χελώνη, nor does the meaning ‘footstool’ found at Timaeus Hist. fr. 24a *BNJ*[2]).

3.1.2 However, possessive derivatives may take on surprising senses: something like ‘tortoise-like’, ‘tortoise-shaped’ hence e.g. ‘sea-turtle’ might work (cf. κυκλόεις ‘circular’ < *‘circle-shaped’ or Lat. *lūnātus* ‘crescent-shaped’, not ‘having a crescent’).

3.1.3 Under LB (in Olsen’s version), various mechanical protoforms possible for χελώνη: *g^{h}éluh$_3$-neh$_2$-, *g^{h}éluh$_3$-h$_{1/3}$n-eh$_2$-, *g^{h}élu-h$_3$n-eh$_2$-…

> But *Fortūna*-type (Nussbaum *apud* Fortson 2020: 70) possessive *g^{h}élu-h$_1$n-eh$_2$- would not give the right result.

3.1.4 But what is *g^{h}eluh$_3$-? Olsen provides no details, so the root etymology must be discussed.

3.2 The word for ‘tortoise’ is reconstructed on the basis of Gk. χέλυς, -υος (f.) and Slav. **žely* > ORuss. *žely*, gen. sg. *želъve*, Slov. *žêlva*, Polish *żółw*, etc.

> ± Lith. *žélvė* ‘tortoise’ (Fraenkel 1962–1965: 1297): Smoczyński 2018: 1725 argues for recent formation from *želvas* ‘yellow’.
>
> ± enigmatic *golaia* ‘*galapago marino sive riano*’ (*CGL* 3.539, 34), variously attributed to Venetic, Illyrian, or Mediterranean IE.

3.2.1 Taken at face value, these forms point to a *u*-stem of some sort made from a root *g^{h}el-.

3.2.2 But in principle, this reconstruction can be emended to *g^{h}elh$_3$-u- which in pre-consonantal position will give *g^{h}eluh$_3$- with laryngeal metathesis. Is there evidence for *g^{h}elh$_3$-?

3.3 Three ideas for the PIE root of ‘tortoise’ are on the record:

3.3.1 **First root etymology (**Mastrelli 1966): *g^{h}el- ‘lip’, viz. tortoise’s beak (Gk. χεῖλος (n.), Dor. χῆλος, Aeol. χέλλος ‘lip’, χελῡ́νη$_2$ ‘id.’, Gmc. **gel(u)nō* ‘lip’ > ON *gjǫlnar* ‘lips, whiskers’).

> (Similarly Andrés-Alba 2023: the reference is to the animal’s snout, χελῡ́νιον).

Gk. χεῖλος positively excludes a root-final laryngeal; but the etymology is not compelling.

3.3.2 **Second root etymology (**Meillet 1905): a connection with the PIE root *$ǵ^{h}$elh$_3$- ‘yellow; green; gold’. Cf. Höfler 2021: “the European pond turtle has very remarkable yellow spots on its head and legs. The turtle shell or plastron, too, is yellowish”.

3.3.2.1 If ‘tortoise’ < ‘yellow–green’, the root-final laryngeal (*h$_3$) is certain:

> Gk. χλωρός ‘bright green, yellowish’ < *$ǵ^{h}$l̥h$_3$-ró-
> Ved. *hiri*° < *$ǵ^{h}$l̥h$_3$-i-
> Lat. *helvus* ‘tawny’ < *$ǵ^{h}$elh$_3$-u̯o-
> ON *glōð* ‘glowing coals’ < Gmc. **glō-*
> Gk. (Att.) χλόη / χλόος ‘green sprout’ < *k^{h}lou̯-o- / -ā- ← PGk. *k^{h}lou̯- < *$ǵ^{h}$leh$_3$-u-
>
> (Does Lat. *fel*, *fellis* ‘bile’ – with dialectal *f* – point to laryngealless *$ǵ^{h}$el-u̯- ‘yellow–green’?)

Alan Nussbaum points out to me that **ǵʰlehₓ-* is thinkable as the original form of the root here, with schwebeablauting **ǵʰelhₓ-o-* (> OIr. *gel* 'bright') produced *secondarily* by what AJN calls the "**CREH-o- > *CERH-o-* syndrome" (e.g. **gʷi̯ehₓ-* 'live' → **gʷói̯hₓ-o-* > (Ved. *gáya-* 'household', Slav. **gojь*) and **gʷoi̯hₓ-ó-* > Lith. *gajùs* 'vigorous') and then generalized to non-thematic stems derived from **ĝʰelhₓ-o-*.

3.3.2.2 Possible problem: the root 'yellow–green' is securely reconstructed with an initial palatal **ǵʰ*, cf. YAv. *zairi-* 'yellow', OCS *zelenъ* 'green', YAv. *zāra-* 'gall' and the word for gold (YAv. *zaraniia-*, Latv. *zę̀lts* and Russ. *zóloto*). This reconstruction would be incompatible with Slav. **žely* 'tortoise' with **ž* < **gʰ* by the first palatalization.

3.3.2.3 However, two circumstances make the comparison between 'tortoise' and the PIE root 'yellow, etc.' formally possible:

- on the one hand, the word for 'tortoise' is also attested in East Slavic as *zelvь*/ *zelvъ* with *z* as if from **ǵʰ* (in 16th–17th cent. dictionaries of Ukrainian).
- on the other hand, there is evidence for *Gutturalwechsel* in the Balto-Slavic derivatives of the color root, cf. Slav. **žьltъ*, Lith. *geĨtas* 'yellow' next to *žeĨvas* 'id.'

  Depalatalization of **ǵʰ* before syllabic **l̥* (**ǵʰl̥-* > **gʰl̥-*) in Balto-Slavic is a possibility to consider (Kortlandt 2013).

3.3.2.4 In addition, the expected laryngeal reflex is not always there, cf. Lith. *geĨtas* and *žeĨvas*.

3.3.2.5 Fraenkel (1955: 349): "[e]s gibt im Idg. zwei Parallelwurzeln, die sich auch in der Bedeutung oftmals berühren", so perhaps two roots, **ǵʰelhₓ-* 'green' and **gʰel-* 'yellow'?

So Matasović 2005: 368; equally possible **ǵʰelhₓ-* 'yellow' and **gʰel-* 'green' or **ǵʰel-* 'green' and **gʰelhₓ-* 'yellow'…

3.3.2.6 *Fazit*: the word for 'tortoise' *could* go back to a color root (not semantically obvious to me), and this color root could in principle have been a seṭ or an aniṭ one, although **ǵʰlehₓ-* / **ǵʰelhₓ-* is the best-supported reconstruction.

3.3.3 **Third root etymology** (Gołąb 1987; Majer 2020: 86 n. 27): the designation of tortoise could come from a root denoting 'skull, shell, hardening'.

3.3.3.1 Important: 'shell / trough / shield, etc.' : 'tortoise' is the single best attested colexification pattern in Indo-European and beyond:

Lat. *testa* 'sherd, shell' : *testūdō* 'tortoise'
Russ. *čerep* 'skull' : *čerepaxa* 'tortoise'
Old English *bord* 'shield' : *byrdling* 'tortoise'
Slovak *koryto* 'trough' : *korytnačka* 'tortoise'
Mod. Persian (< Arabic) *kāsa* 'bowl' : *kāsapušt* 'tortoise' (*pušt* 'back')
Swedish *sköld* 'shield' : *sköldpadda* 'tortoise' (*padda* 'toad')
(= Finnish *kilpi* 'shield' : *kilpikonna* 'tortoise' (*konna* 'toad'))

Welsh *crogen* ‘shell’ : *crogengranc* ‘tortoise’ (*cranc* ‘toad’)

Perhaps Arm. *kur* ‘bowl, tub’ : *kriay* ‘tortoise’ (unclear suffix)

Perhaps *kad^h-?? ‘covering’ (PDE *hat*, Lat. *cassis* ‘helmet’) : *$kats̯$- >
YAv. *kasiiapa-* ‘turtle’, and (with irregular phonology) Ved. *kaśyápa-*
(Leumann 1942: 14; Čop 1973: 228)

Ott. Turkish *tekne* ‘wash tub’ : Hungarian *teknős* ‘tortoise’ (with a poss. suffix)
(A calque from Turkish also in Arm. dial. *taštov gort* ‘frog with a bathtub’)

Mongolian *jas* ‘bone’ : *jast melxii* ‘tortoise’ (*melxii* ‘toad’)

Uyghur *müjüz* ‘horn, bone’ : *müjüz baqa* ‘tortoise’ (*baqa* ‘frog’)

Ottoman Turkish *qaplu* ‘covered’ : *qaplu bayа* ‘tortoise’ (*bayа* ‘frog’)

Akkadian *šeleppûm* ‘turtle; shell, canister’ etc. etc.

3.3.3.2 Gołąb compares Slav. **golva* (Russ. *golova*), Lith. *galvà* ‘head’ < *$\underline{galu̯ā̆}$ < *$g^holHu̯éh_2$

Majer tentatively compares Slav. **žely*, **želъve* ‘hard swelling, tumor’. Both could be right!

3.3.3.3 Further comparanda for *g^helH-u- ‘shell, skull’ would include:

Alb. (Tosk) *guall* ‘shell, skull’ < Proto-Alb. *$gāl(u̯)a$- < *$g^hēlH(u̯)o$-

Arm. *glux* ‘head, top’ < Proto-Arm. *$gVlū$-k^ho- where V = *i (< *$ē$/*$ĭ$), *u (< *$ō$/*$ū$)

Difficult word; *$g^hēluH$- < *$g^hēlH$-u- seems the easiest mechanical back-reconstruction.

3.3.3.4 *g^helH- could be the root *g^helh_2- ‘hard’ in the words for ‘hail’: *g^helh_2-d-, *$g^hl̥h_2$-d- (Gk. χάλαζα, Pol. *żłód*; *g^helh_2-d-o- > PIr. **žarda-* > Mod. Pers. *žāla*, Pashto *ž´aləy* ‘hail, hoarfrost’

3.3.3.5 Tempting to relate Arm. *jełun* ‘roof, covering’ but this would require reconstructing *$ǵ^helH$- with *Gutturalwechsel* or depalatalization in Balto-Slavic next to a liquid: this way we could keep BSl. *$galu̯ā̆$ ‘head’ and Slav. **žely* but not the Albanian and Armenian forms in **3.3.3.3**.

3.4 ***Fazit***: the connection of ‘tortoise’ with ‘shell, skull’ (*g^helH/h_2-, “root etymology 3”) seems semantically more plausible than the widely assumed connection with ‘green, yellow, etc.’ (*$ǵ^helh_3$-, “root etymology 2”). Phonologically, the (Balto-)Slavic forms in *g-* / *ž-* are easier to derive from *g^h without invoking additional assumptions.

3.4.1 Importantly, under both root etymologies the root-final laryngeal is assured, which allows for the theoretical possibility of a preconsonantal allomorph *$g^h/ǵ^helH$-u- > *$g^h/ǵ^heluH$-.

3.4.2 This *$g^h/ǵ^heluH$- could unproblematically lead to an “*ū*-stem” (> Gk. χέλυς, Slav. **žely*).

3.4.3 This possibility remains on the table, but it will not be pursued today. Instead, I will consider an alternative analysis.

4. We have established that under either of the two root etymologies of the word for ‘tortoise’ (‘green, yellow’ or ‘shell, skull’), its root contained a laryngeal, either known to be *h_3 (Gk. χλωρός) or specifiable as *h_3 in the absence of decisive data (Lith. *galvà*), with *h_2 being merely a possibility (**3.3.3.4**). This allows positing a PIE preform *$ǵ^héluh_3$-neh₂ *vel sim.* which by Olsen’s rules will undergo LB, giving Proto-Greek *$k^helu̯ōnā$-.

4.1 But does χελώνη really go back to Proto-Greek *$k^h el̯ōnā$-?

The preform *$k^h el̯ōnā$- certainly works for Attic χελώνη (Soph. fr. 279 +) but the expected outcome of *$k^h el̯ōnā$- in East and Central Ionic as well as in Argolic and Insular Doric dialects would be *$k^h ēlōnā$- with the Third Compensatory Lengthening.

But we never find the form *χειλώνη, which is a red flag. Still, the situation is messy.

4.1.1 χελώνη in *H. Merc.* (42, 48) with a metrically assured short vowel is unlikely to be an Atticism and could be taken as an East Ionic form.

> For a refutation of Attic elements in the poem see Janko 1982: 142–148.

However, this form does not constitute decisive evidence against the reconstruction *$k^h el̯ōnā$-: the poet of *h. Merc*. could have been a Euboean Ionian (so Fick 1897: 272) in which case West Ionic χελώνη < *$k^h el̯ōnā$- would be regular.

> Fick's theory is actually no longer widely accepted: he compared ἠχοῦ 'where' (*h. Merc.* 400) with ἠχοι attested in Oropos (*IG* 7.235.16, c. 380 BCE), but both the stem ἠχ- and the ending -οῦ are otherwise attested in early epic; for a position for skepticism see Vergados 2013: 148, 490; Thomas 2020: 366.

4.1.2 χελώνη in Hdt. 1.47 appears to speak against *$k^h el̯ōnā$-; however, the word is found not in Herodotus' own narrative, but in a hexametrical Delphic oracle (52 Parke–Wormell = Q 99 Fontenrose), written in an imitation of Epic Ionic but with three instances of Attic correption in five lines; the form may therefore be Attic and in any event cannot be securely attributed to Herodotus' East Ionic.

> In principle, an atticism in Herodotus remains a possibility to be reckoned with, e.g. ὅλου (2.126), δόρατα (7.89), κόρας (4.33), see Bechtel 1924: 15–16.

4.1.3 The form χελώνη is found in three works belonging to the *Corpus Hippocraticum* and dated to 5th–4th cent. BCE (*Mul*. I, 8.166.4, 8.172.14, 8.186.15; *Mul.* II, 8.388.6; *Hum.* 5.492.2 Littré). Since *CH* is written in East Ionic, transmitted χελώνη may appear to speak against *$k^h el̯ōnā$-; however, the form cannot really be used as an argument, since the text of the medical treatises was normalized beginning in antiquity.

In addition, there is a possibility, albeit remote, that χελώνη in a Doric intrusion, hailing from one of the dialects of the Dorian Hexapolis (possibly native for the authors of the medical treatises), in which the Third Compensatory Lengthening never occurred.

> For Doric elements in *CH*, including in *Mul*. I/II where χελώνη is attested, see Schmidt 1977.

4.1.4 To sum up, while the absence of *χειλώνη is a red flag, on the basis of literary attestations alone it is impossible to be absolutely certain that χελώνη does not go back to *$k^h el̯ōnā$-.

4.2 We have to turn to epigraphic data, bearing in mind that early alphabets do not distinguish between /ē/ and /e/ (<E>). The epigraphic evidence is limited to onomastics.

4.2.1 A personal name Χελώνη is attested on Samos (*IG* 12.6.2 649), where the expected East Ionic reflex of *$k^h el_{\underline{u}} \bar{o} n \bar{a}$- would have been *Χειλώνη; however, if the tomb inscription is correctly dated to the 5th cent. BCE by Hallof, it is possible that <E> stands for [ẹ̄].

> Similarly, Χελο[attested on Paros (*SEG* 52.797, 540–530 BCE) can stand for *$k^h elo$- or *$k^h \bar{e}_{\underline{}} lo$- and is therefore not diagnostic.

4.2.2 A more reliable witness: a certain Χελωνίων is mentioned on the list of local magistrates of Thasos all of whom bear Ionian names (*IG* 12.8 277 E, l. 99). This Chelonion's public service is datable to the second quarter of the 4th cent. (*Contra* Bechtel's "5. Jhdt." (1917: 588), see Fredrich 1909: 92 (*IG* 12.8); Pouilloux 1954: 263): if his name was added to the list of the *theori* in the 4th cent., it would have been spelled as *Χειλωνίων. The absence of -ει- in his name contrasts sharply with Ξεινομέν[ης in the same inscription (B, l. 23).

> For Thasos and its metropolis Paros the effects of CL3 are confirmed by metrically ascertained μ̄ονος (*CEG* 416, Thasos, 525–500 BCE), κᾱλον (*CEG* 160.1, Thasos, 500–490 BCE), Πολυᾱρητος (*CEG* 412, Paros, 600–550 BCE), κ̄ορηι (*CEG* 414, Paros, ca. 500 BCE), etc.
>
> Χελωνίων is also attested in a later Thasian inscription (*IG* 12.8 313; 2nd cent. BCE). The name is also known in Attica (*IG* 2^2 16; 394/3 BCE), and in theory, an argument could be made that all Chelonions in Thasos came from Attica. There is not a shred of evidence for this assumption.

4.2.3 Recently the name of another 4th-century *theoros* on Thasos was published by Hamon 2018: 190: the interesting form Χ̣έλων may confirm the doubts about the derivation of χελώνη from *$k^h el_{\underline{u}} \bar{o} n \bar{a}$-, but the morphological analysis may be different (more below).

4.2.4 It appears, therefore, that <u>χελώνη has never been a Laryngeal Breaking case</u>.

5. So what is it? Back to the morphology of χελώνη (and χελῡ́νη and χέλυς).

5.1 χελώνη can be explained in a variety of ways:

- as resulting from lexical analogy to other animal names ending in -ωνη, cf. ἑλεδώνη 'octopus' or κορώνη 'crow' (Höfler 2021).

  > It is even conceivable that χελῡ́νη was remade as χελώνη.

- as a derivative from a thematic stem *$g^h elo$-: χελώνη < $^{TP}g^h eloh_1$-neh_2- (Schmeja 1963: 40).

  > If the etymological connection with *$\hat{g}^h elh_3$- / *$\hat{g}^h elh_3$- 'yellow, etc.' is accepted, evidence for this thematic stem can be sought in OIr. *gel* 'fair, shining' standing next to *$g^h ólo$- (> Gk. χόλος 'bile, anger', Av. *zāra*- 'bile').

But yet another, somewhat more involved explanation may be available, for which we need to turn to the base word χέλυς, -υος.

5.2 In the modern works of reference, the word for ‘tortoise’ is usually reconstructed as an *ū*-stem: Gk. χέλῡς / χέλῡν, Slav. **žely* < **g*^{h}*el-ū-*.

> See e.g. Martínez García 1996: 246–248; Matasović 2014: 59.

5.2.1 What kind of an *ū*-stem? Could it be **-uh₂-*?

- feminine (“Motion”) *h₂*-derivative from a *u*-stem of the type Ved. *nr̥tú-* ‘female dancer’?
- a concretized *-h₂-* abstract made to a *u*-stem adjective, cf. **tn̥h₂-ú-* ‘thin, slender’ (Ved. *tanú-*) → **tn̥h₂-ú-h₂-* ‘slenderness’ (Ved. *tanū́-* f. ‘body’, see Pinault 2001: 197–198)?

The barytone accent in Greek is not conducive to either of these interpretations.

5.2.2 As we saw above (**3.4.2**) an analysis starting with **ǵ*^{h}*elh₃-* / **ǵ*^{h}*leh₃-* ‘yellow, etc.’ can more or less easily generate the allomorph **ǵ*^{h}*eluh₃-* from pre-consonantal **ĝ*^{h}*elh₃-u-*, and similarly a *u*-stem derivative from **g*^{h}*elH-* of Slav. **galva* can produce **g*^{h}*eluH-*.

5.2.3 However, neither Gk. χέλῡς nor Slav. **žely* guarantee an **-ū-*stem.

5.2.3.1 The length in χέλῡς/ν is limited to the *h.Merc.*, where χέλῡς / χέλῡν is found in thesis before another vowel at 24, 33 and 153, while other metrical texts have χέλῠς / χέλῠν (Alc. 359.2; Aesch. fr. 621.3; Eur. *Alc*. 447, etc.).

At least the scansion χέλῡν εὐρών at *h. Merc*. 24 may reflect the prosody of earlier χέλυν ϝεὐρών (for this analysis of εὗρον see Kostopoulos 2014–2015).

5.2.3.2 As to Slav. **žely*, it has been recognized for some time now that the Slavic nominal class in **-y* has more than one origin, including **-ōs* from nom. sg. of amphikinetic *u*-stems (**-ōs* < **-ō* + *s* < **-ōu̯*). See now especially Majer 2020 for **zъly*, **zъlъve* ‘sister-in-law’ vis-à-vis Gk. γαλόως and generally for the **-y* / **-ъve* nominal class.

5.4 The **-uH-* approach is not the only way of explaining the morphology of Gk. χέλῡς and Slav. **žely*.

Proposal: to return to the amphikinetic analysis of this word (**g*^{h}*el-ŏu̯-*) proposed by Kuiper 1942: 208 and then Snoj 1994: 504–505; 2004: 540 n. 18.

> *Contra* Kuiper, Hsch. χ 321 *χελεύς· κιθάρα (conjectured by M. Schmidt) does not go back to an archaic ablauting *u*-stem paradigm but must represent a late remodeling of χέλυς (so also Schmeja 1963: 40); *contra* Specht 1931: 123, the preceding lemma Hsch. χ 320 χελεῦ χελώνη is best taken together with χελῑχελώνη ‘torti-tortoise’ from the children’s song *PMG* 876 c1, on which see Zelchenko 1999; C. Neri 2003: 244–253.

5.4.1 Following Kuiper, we can reconstruct the following PIE paradigm:

nom. sg. **g*^{h}*él-ŏu̯-s*

acc. sg. **g*^{h}*él-ou̯-m̥* > **g*^{h}*el-ōm* (with Stang’s Law)

gen. sg. **g*^{h}*elu̯-és vel sim*.

What would happen with this crazy allomorphy in Greek?

5.4.2 We can hypothesize that on the way to Greek this paradigm would be remodeled in the same way as **nek̂-ou̯-* / *-u̯-* 'corpse': this amphikinetic paradigm can be reliably reconstructed on the basis of YAv. acc. sg. *nasāum*, nom. pl. *nasāuuō* and Welsh *angheu* 'death'.

> According to Nussbaum 2001, the Proto-Celtic plural **ankou̯es* 'dead ones' could have been reinterpreted as 'death' in an early Celtic version of the phrase attested in Old Irish as *téit do écaib* 'dies' < *'goes to death' < *'goes to the dead ones'.
>
> For **nek̂-ou̯-* see also Hackstein 2002: 207–208; Widmer 2004: 72–73; Steer 2015: 89–105.

5.4.3 As Nussbaum 2001 has argued, the Proto-Greek declension nom.sg. **nékŏ̯us*, acc. sg. **nékōn* (< **-ou̯m* with Stang's Law), obl. **neku̯-* underwent the following remodeling by a series of four-part proportional analogies:

First, nom. **nékŏ̯us* ⇒ **nékus*:

(1) gen. sg. **-u̯os* (e.g. Hom. υἱός) : nom. sg. *-us* (e.g. Cret. υἷυς)

= gen. sg. **neku̯os* : X, where X is resolved as nom. sg. **nékus*

(*mutatis mutandis*, same in Avestan: nom. sg. *nasuš*)

Then acc. sg. **nékōn* ⇒ **nékun*:

(2) nom. sg. **-us* (e.g. πολύς) : acc. sg. *-un* (e.g. πολύν)

= nom. sg. **nekus* : X, where X is resolved as acc. sg. **nékun*

Finally, the original oblique stem **neku̯-* was remade as **nekuu̯-* by analogy to the more productive type of *u*-stems:

(3) nom. sg. **-us* (e.g. γένυς 'chin, jaw') : gen. sg. **-u(u̯)os* (e.g. γένυος)

nom. sg. νέκυς : X, where X is resolved as νέκυος

5.4.4 In the same way, Gk. χέλυς would have originated in an amphikinetic Proto-Greek paradigm with nom. sg. **kʰelŏ̯us*, acc. sg. **kʰelōn*, and obl. **kʰelu̯-* remade as **kʰelŭs*, acc. sg. **kʰelun*, obl. **kʰeluu̯-*.

5.4.4.1 The length in χέλῡς can be explained in a variety of ways: either as a metrical lengthening or by analogy to the type σῦς / σῠός 'swine' and ἰχθῦς / ἰχθύος 'fish'. Here, again, the situation with νέκῡς provides a parallel (see Beekes & Cuypers 2003: 485–488 for a metrical explanation and Steer 2015: 93–94 for the analogical one).

6. However, this analysis of χέλυς still does not provide an explanation for χελώνη: while there may have been an allomorph **gʰel-ŏ̯u-* in the prehistory of the word for 'tortoise', we cannot use it to get χελώνη: **gʰel-ōu̯-neh₂* would have in all likelihood undergone Osthoff's Law and come out as **kʰeloun̥ā* > *χελούνη, cf. **gʷōu̯s* (Ved. *gáuḥ*, YAv. *gāuš*) > βοῦς.

The derivation **gʰelōu̯neh₂* > **gʰelōnā* has been proposed (e.g. Kretschmer 1892: 335) but it is not attractive. See **Appendix 4** for a critical discussion of alleged cases of **ōu̯C* > **ōC*.

6.1 It is important to bear in mind that the speakers of Proto-Greek had more than one way of eliminating the allomorphy in the paradigm nom. **k^{h}elŏ̯u̯s*, acc. **k^{h}elōn*, obl. **k^{h}elu̯-*, and other amphikinetic *u*-stems provide a welcome parallel.

6.2 The word ἥρως ‘hero’ goes back to an amphikinetic *u*-stem **hēr-ŏ̯u̯s*, **hēr-ōn*, **hēr-u̯-* (Peters 2002: 362–363).

> Root etymology is *cura posterior*, with **sēr-ou̯-* or **Hi̯ēr-ou̯-* being the two most frequently discussed options; differently Pinault 2016.

6.2.1 Traces of *u*-stem declension have been preserved in Corinthian ηεροϝος, ηεροϝι (see García Ramón 2016: 56 and Alonso Déniz 2022: 158).

6.2.2 The word was *mostly* remodeled as an *-ōh-* stem in pre-Mycenaean times: **hēr-ŏ̯u̯s*, **hēr-ōn*, **hēr-u̯-* ⇒ **hēr-ōs*, **hērōh-os*, etc., cf. Myc. *ti-ri-se-ro-e*.

6.2.3 But there are traces of yet another remodeling.

As amphikinetic *u*-stem inflection was eliminated in Greek, new *n*-stem declensional forms emerged on the basis of the old acc. sg. ἥρων (Hdt. 1.167; Ar. fr. 712), the Stang’s Law product of expected **-ou̯-m*.

> Cf. acc. sg. πάτρων (Hdt. 7.76.6) < **ph$_2$trōm* < **ph$_2$trou̯m* (see Rau 2011).

6.2.4 The “Stang-accusative” in *-V̄n* could have been expanded with the standard acc. sg. ending -α, cf. Ζῆν ⇒ Ζῆνα, and the resulting forms in *-na* could have been reanalyzed as *n*-stem forms (Ζηνός, etc.).

> *Quod licet Iovi, not licet bovi*: βῶν ⇒ βοῦν never became *βῶνα

This is how acc. ἥρων was remodelled as ἥρωνα (Cos, *IG* 12.4 1:72, 270 BCE), and a full *n*-stem declension was back-formed to it: cf. Syracusan Doric ἡρώνεσσι (Sophron 151 Hordern) and the Ephesian nom. sg. ἥρων (*IK* 17.3222), see Speidel 1985.

6.2.5 Similarly, ἄλως, -ωος ‘threshing floor’ goes back to an *-ou̯-* stem, cf. Cypr. *a-la-wo* (*ICS* 217); Hsch. α 3251 ἄλουα· κῆποι; ἀλωή ‘threshing floor’ ← **(h)alōu̯ó-*.

> See the detailed study of the word by Kostopoulos 2014: 198–209.

The word is attested with acc. sg. ἄλωνα, dat. sg. ἄλωνι in the Arcadian dialect and in the Koine (see Bechtel 1921: 355; Dubois 1988: 121).

6.3 Could an *n*-stem paradigm of the word for ‘tortoise’ have been back-formed to acc. sg. **k^{h}elōna* ⇐ **k^{h}elōn* < **g^{h}elH-ou̯-m* in the same way as acc. ἄλων led to nom. $^{(*)}$ἄλων, gen. ἄλωνος or acc. ἥρων led to nom. ἥρων, gen. ἥρωνος? **Yes**.

The *n*-stem declension is directly attested in Thasian PN Χέλων, mentioned above (**4.2.3**, Hamon 2018: 190), supported by Thessalian *Χέλουν (inferred from the patronymic Χελούνειος, see García Ramón 2007: 58). This form (a single-stem uncompounded PN ‘Mr. Tortoise’) has the same derivational history as Ephesian ἥρων (**6.2.4**).

6.4 Once an *n*-stem paradigm χέλων, *χέλωνος becomes available, we can easily derive χελώνη from this *n*-stem, as an endocentric extension or simply "feminization" after χέλυς (f.):

> ἄγκων 'elbow' → ἀγκώνη 'id.'
>
> μελεδών 'care, anxiety' → μελεδώνη 'id.'
>
> *κολών 'hill, heap' → κολώνη 'id.'
>
> (Potentially supported by other animal names in -ωνη, cf. κορώνη 'crow', see **5.3)**.

6.5 We have seen that while χελώνη cannot go back to Proto-Greek *k^h*elu̯ōnā*- (which would have given East Ionic *k^h*ē̯lōnā*-), there are thus at least three (actually, more) ways of accounting for the word:

> (1) χελώνη could be analogical to other animal names ending in -ωνη;
>
> (2) χελώνη could be a derivative made from a thematic stem *g^h*elo*- / *$ǵ^h$*elo*-;
>
> (3) χελώνη can be analyzed as a derivative from the oblique stem *k^h*elōn*-, itself a predictable product of remodeling of PIE *g^h*elH-ou̯*- / -u̯- in Greek.

Instead of pushing χελώνη back to PIE prehistory (for instance, Olsen's *g^h*éluh₃-h₃n(h₂)-eh₂*- or derivation from *g^h*/$ǵ^h$*elo*-), an inner-Greek solution (3) has been proposed.

7. One loose end: Ionic χελῠ́νη, Asia Minor Aeolic χελύννᾱ (**3.1**)

> Ionic χελῠ́νη (first in Nicander *Al.* 555, 557; *Th.* 703).
>
> Asia Minor Aeolic χελύννᾱ (Sappho 58c2, 58b.11 Neri; certainly dependent on Sappho are Erinna fr. 4.5 Neri and *EM* 808.25: δηλοῖ καὶ τὴν κιθάραν παρ' Αἰολεῦσι).
>
> "Doric" χελῠ́νᾱ in Callim. fr. 196.22 Pfeiffer

7.1 *k^h*eluh-nā* with a real 1CL would be very difficult to motivate.

> But not impossible. E.g., if the word for 'tortoise' was *also* remodeled on the model of *hēr-ōs, *hērōh-os (**6.2.2**) as *k^h*elōs, *k^h*elōh-os* (beside *k^h*elŭs, *k^h*eluu̯-os* and *k^h*elōn, *k^h*elōn-os*), one could theorize that a contamination of obl. *k^h*eluu̯-* and *k^h*elōh-* led to *k^h*eluh-* (type YAv. *gərəbuš-*, *g^w*elp^h*uh-* > δελφύς 'womb') from which *k^h*eluh-nā* can be unproblematically derived. Come to that, the oblique stem *k^h*elōh-* could even have provided the derivational basis for χελώνη. But this is an overwrought solution, smelling of the lamp.

7.2 χελύννᾱ with a geminate in Sappho may have been substituted by the Alexandrian editors of Sappho for original *χελῠ́νᾱ, based on analogy to cases like Ionic ἔκρῑνε : Aeolic ἔκριννε (Proto-Greek **krin-i̯e/o*-), since they knew that the word scanned as ⏑ – –.

> Compare δίννεντες (Sa. 1.11) for expectable δῑ́νεντες, similarly due to Alexandrian ecdotic interference (for δῑνέω / δῑ́νημι see Nikolaev [*to appear*$_2$]).

Under this analysis, the Proto-Greek form was *k^h*elūnā*-.

7.3 Morphological derivation

(The derivation below is provided for the root etymology discussed above in **3.3.3**, viz. the *testūdō* / *čerepaxa* / *byrdling* semantic model "having a shield / cover / shell, etc.". It is unclear what the PIE root *$g^{h}elH$- of Slav. **galva*, etc. meant, but 'hard' is one option (cf. *$g^{h}elh_{2}$- 'hail': **3.3.3.4**). Everything said below will also work for the alternative etymology in **3.3.2**, viz. the connection with *$ǵ^{h}elh_{3}$- / *$ǵ^{h}leh_{3}$- 'green, yellow, etc.', except that at the beginning of the derivational chain we will have an abstract noun 'yellowness', not 'hardness', and *Gutturalwechsel* would have to be assumed for BSl.)

*g^{h}*ó/élH-u*- 'shell' < *'hardness'

1) → *$g^{h}elH$-*o̯u̯*- 'having a shell' (an internally-derived amphikinetic possessive)

> Slav. **žely* 'tortoise'

> PGk. *$k^{h}el\breve{o}\underset{\smile}{u}s$, acc. sg. *$k^{h}el\bar{o}n$, and obl. *$k^{h}el\underset{\smile}{u}$- 'tortoise'

⇒ Gk. χέλυς, -υος (secondarily χέλῡς)

⇒ Gk. χέλων, -ωνος

→ / ⇒ Gk. χελώνη

2) → *$g^{h}elH$-u-h_{1}no*- 'having a shell' (an externally-derived possessive, Latin type *Portūnus*,

→ *$g^{h}elH$-u-$h_{1}neh_{2}$*- see Fortson 2020)

> PGk. *$k^{h}el\bar{u}n\bar{a}$- 'tortoise'

> Gk. χελύνη

There are ample parallels for synonymous external and internal possessive derivatives in Indo-European; this is one such case.

Cf.

**dó/ém-u*- 'house(hold)'

1) → *d(e)m-o̯u̯*- 'the one in charge of the household' > Gk. δμώς 'slave' (differently Widmer 2008)

2) → *dom-u-h_{1}no*- 'the one in charge of the household' → / ⇒ Ved. *dámūnas*- '*Hausherr*, etc.'

(see Pinault 2001)

8. Laryngeal Breaking.

Once all examples of laryngeal breaking in Greek, advanced by Normier, Rasmussen and Olsen, have been critically analyzed in the same way I did today with χελώνη, and a careful and unprejudiced discussion of counterexamples has been provided, we can return to the etymologically waterproof trio of examples ζωός, πρόσωπον and δηρός and carefully weigh pros and cons of full-grade analyses *$g^{w}i̯eh_{3}$-u̯ó*-, **proti-$h_{3}\bar{o}k^{w}$-o*-, and *$du̯eh_{2}$-ró*-.

* * *

Appendix 1: Hyllested–Cohen Hypothesis

(monophthongization of *u*-diphthong before labial consonant in Greek; Kristoffersen 2019)

> κῡφός ‘hunchbacked’, κῦφος ‘hump’ < **kou̯bʰ-o-* from **keu̯bʰ-* ‘lean forward’ (Gk. κύπτω, Ved. *kubhrá-* and *kubjá-* ‘humpbacked, crooked’, Lith. *kaũbras* ‘hump’). Root-etymology unavoidable; **keHubʰ-* (with Weather Rule where necessary) clearly inferior.
>
> λῡ́πη ‘pain, grief’ < **lou̯p-eh₂* from **leup-* (Lith. *lùpti* ‘to peel, fleece, flay’). The root-etymology is plausible (self-infliction in grieving rituals); add Hitt. *lumpašti-* ‘grief’.
>
> τρῡπάω ‘bore’ < **trou̯p-ah₂-i̯e/o-* from **treu̯p-* (Lith. *trupėti* ‘to crumble’). Could show contamination with **treu̯H-* (τρύω) within Greek.
>
> στῡ́φω ‘contract, draw together; be astringent’ (next to στῠφελίζω ‘beat, strike’?) is argued to come from **st(r)ou̯bʰ-i̯e/o-* with a pecular *o*-grade made from the root **streu̯bʰ-* with a loss of **r*. Very uncertain. στῡ́φω best from the root of στύω ‘to make stiff’, Ved. *sthū́na-* ‘pillar’.
>
> τῡ́φω ‘raise a smoke’ < **dʰou̯bʰ-i̯e/o-*; very pecular *o*-grade. Instead we could invoke **(s)dʰu̯eh₂bʰ-* (Goth. *stubjus* ‘dust’), an extended version of the root of Hitt. *tuḫḫai-* and Gk. θῡμός. The ῡ / ῠ alternation in τῡφε/o- : ἐτῠ́φην is easily explainable as secondary within Greek.
>
> χῡμός ‘juice (of plants)’ < **ǵʰou̯-mó-* (= Ved. *hóma-* m.): or zero-grade **ǵʰu-s-mó-*?

Contra:

> κοῦφος ‘nimble’ remains a descriptive counterexample. The proposed derivation from a compound ‘light (as if made of hair)’ from **kos-* ‘hair’ and **h₂ubʰ-* ‘weave’ (van Windekens) defies belief.
>
> Note also κῦδος where no labial consonant follows (< **keu̯d-es-*, Slav. **čudo*).
>
> More importantly, Greek has instances of ῡ/ῠ ablaut (see Hackstein 2002: 207–208), notably in νυ-presents, which cannot be a case of the Hyllested–Cohen rule.

* * *

Appendix 2: some counterexamples to Laryngeal Breaking in Greek (a partial and bare list)

1) θῡμός < **dʰuh₂-mó-*

2) ὀπῑπεύω ‘look at’, voc. παρθενοπῖπα (*Il*. 11.385) ‘staring at girls’ < **opi-h₃kʷ-ó-*

> Note Normier’s alternative etymology **h₃kʷih₁-pah₂* ‘eye-grazing’, “Augenweide”. Hinge apud Hyllested 2004: 61 n. 5 suggests dissimilation **-h₃kʷ-* > **-h₁kʷ-*; not compelling.

3) λῑμός ‘hunger, famine’ < **lih₂-mó-* vs. λοιμός ‘plague’ < **loi̯(h₂)-mó-*, cf. λιάζομαι ‘collapse’ (λιά- < **lih₂-e-*), Goth. *af-linnan* ‘go away’ < **linh₂-*.

4) ῥῡτός ‘quarried’ (*Od*. 6.267, 14.10; about rocks with which the assembly is paved; isolated in Greek) < **ruh₂/₃-tó-*, cf. Lat. *ruō* ‘dig out’, Lith. *ráuti* ‘tear out’ and for the laryngeal cf. Toch. B *rwātär,* A inf. *rwātsi* ‘pull out’ (not **h₁*).

5) ἰμονιά (ῑ) ‘well-rope’ from the root **seh₂-i-* ‘to bind’:

**seh₂i-mn̥* ‘binding’ → **sh₂i-món-* (> Hitt. *išḫimān-* ‘string’)

> **sih₂-món-*

> Gmc. **sīman-* (m.) ‘rope’,

> perhaps Ved. *sīmán-* ‘dressing of hair’, ‘crown’

> Gk. **hīmṓn-* → ἰμονιά

6) βρῑθύς ‘heavy’ < **g^{w}rih₂-d^{h}h₁-ú-* (to which the verb βρῑ́θω ‘am heavy’ is formed after πλήθω : πληθύς, Rothstein-Dowden 2022). For **h₂* cf. Lat. *gravis* which seems to back to full-grade **grău̯-* < **g^{w}reh₂u-* with an added *-i-*. For **g^{w}rh₂-i-C* > **g^{w}rih₂-* > **g^{w}rī-* cf. Ved. *grīṣmá-* ‘summer’ (SCE: **semh₂-* ‘season’), Welsh *bryw* ‘strong, lively’ < **g^{w}rī-wo-*. (And βρια/ερός ‘strong’ is probably a secondary replacement of **βρῑρός*).

7) λῑρός ‘wanton’ next to λαιμός₂ ‘wanton’ where the ablaut -αι- ~ -ῑ- suggests **-eh₂i-* ~ **-ih₂-*. Perhaps to the root of Hitt. *laḫlaḫḫiya-* ‘to be in (emotional) turmoil’, but I don’t insist on the etymology.

8) πίτῡρον ‘husk(s) of corn, bran’ < **pituh₂-ró-* ‘that which has / contains sustenance’ ← **pitúh₂-* ← **pitú-* (cf. OIr. *ith* ‘corn’, Ved. *pitú-* ‘sustenance’, Lith. *piẽtūs* ‘meal’.

9) πῡρός ‘wheat’ if < **puh₂-ró-* ← **peu̯h₂-* ‘cleanse (from chaff)’ (Janda 2000; uncertain).

10) ἐνῑπή ‘reproach’ either < **(h₁)eni-h₃k^{w}-éh₂* ‘(hostile) glance’ or from **(h₁)eni-h₂k^{w}-éh₂* (de Decker: **h₂ek^{w}-* ‘to hurt’, cf. Ved. *áka-*, Av. *aka-* ‘pain’)

11) (*)ἤνῑς (the ever-problematic Homeric epithet of oxen), whatever its etymology, appears to be an instance of a stem in *-ī-* < **-ih₂-* (ἤνῑς is both acc. pl. of the word (3x in the Iliad) and its expected nom.sg., as can be inferred from the paroxytone accusative ἤνῑν taught by Tyrannio and printed at *Il.* 10.292 by West; the accentuation ἦνιν transmitted by almost all manuscripts and advocated by Herodian, produces an unparalleled trochaic fourth foot).

12) γῡρός ‘round, curved’ (*Od.* +) < **guh₂-ró-*, cf. Gmc. **kūla-* ‘round’ < **guh₂-lo-* and, perhaps, τὸ γύαλον ‘hollow’ if < **guh₂-elo-* (the influence of γῦρος ‘circle’ Men. + is unlikely). Difficult root.

13) θιβρός ‘stinging, mordant, piquant’ < **d^{h}ih₂g^{w}-ró-* from the root of τιθαιβώσσω ‘bite’[?], Toch. B *tsākā-* ‘to bite’ (unless to δάκνω), Lith. *díegti* ‘to poke, sting’ and Lat. *fīgere* ‘insert, pierce’, *fībula* ‘pin’. But neither the meaning nor the root reconstruction is certain.

14) κρῑός ‘ram’ if < **kŕih₂-u̯ó-* / **kŕih₂-i̯ó-* ‘horned’ (κέρας).

15) ἰχανάω, ἰχαίνω (ῑ) ‘to desire, try, crave’ < **h₂i-h₂g^{h}-* ‘desire’, cf. Ved. *īhate* ‘desires’, Av. *iziieiti*, full-grade **h₂eg^{h}-* in YAv. *āzi-* ‘desire, greed’; for **h₂* cf. Gk. ἀχήν/ ἠχήν ‘poor’, but very uncertain. As an alternative, PIE **Hei̯g^{h}-* is possible (cf. Toch. B *ykāssäññe* ‘sexual desire, *kāma-*’ ← **i̯äkā́-*); another option would be to reconstruct root-accented **h₂íh₂g^{h}-e/o-* (= *īhate*) > **ἴχομαι or a series of derivatives from **h₂íh₂g^{h}-r̥/-n-* > ἶχαρ (a hapax in Aeschylus): no LB expected in accented syllable.

Appendix 3: some examples of Laryngeal Breaking in Greek, explained differently

(Again, a bare list, minimally referenced)

1. ἀρίζηλος ‘clear’ is better taken not from “State II” of the root **deu̯ih₂-* (Arc. δέατο) with a problematic Schwebeablaut but from metrically lengthened **ἀριδει̯αλος ‘very visible’ > **ἀρισδεαλος, cf. δάπεδον > ζάπεδον ‘ground, floor’ (the alternation *d-* / *zd-* exploited for metrical purposes and ultimately analogical to inherited *k-* / *sk-*). The advantage of this approach is that an array of Greek adjectives with similar meanings (δῆλος, δίαλος, ἀρί/ἐκ/κατάδηλος, ἀρίζηλος) are explained from one and the same protoform **(-)deu̯ih₂-lo-*.

2. ἐρωτάω ‘ask’ is unlikely to go back to **h₁ruh₃-teh₂-i̯e/o-* since there is no evidence for root-final **h₃* (cf. forms like εἴρομαι, ἐρευνάω, ἐρευταί). The verb can be taken from a denominative adjectival **eru̯ōto-* ‘investigatory’, an **-oh₁-to-* derivative from **h₁rou̯o-* ‘act of inquiring’, coll. **h₁ru̯eh₂* (Vine 2002)

2. ἠνορέη ‘(excessive) masculinity’ does not have to go back to Normier’s **h₁su-h₂nor-ei̯ā* (with a wrong suffix and the presumed loss of the initial laryngeal in composition; a direct phonological development from **ehu̯ānori̯ā* is unlikely). Easier to take as decompositional from the allomorph **-ānor-* with Wackernagel’s lengthening (extracted from ἀγήνωρ, πολυᾱνωρ etc.) or as a metrical lengthening of the type ἠγάθεος from **ἀγάθεος*.

4. ζᾱτός ‘sought for’ (Arc.), ζητέω ‘seek (for), seek to understand, investigate’: for **i̯eh₂-tó-* (= Av. *yāta-*, Ved. *-yātá-*) as a full-grade substitute for expectable (but probably phonologically undersirable) **ih₂-tó-* see Vine 2004.

5. ζωμός ‘broth, soup’ *could* be taken with Olsen from **i̯uh₃-mó-* (Lat. *iūs*, Ved. *yūṣ-*, Slav. **juxa* ‘broth’), although the phonology of Proto-Greek **dᴲi̯ōmó-* (LB) would be unparalleled; there is no evidence for **h₃* specifically in this word. Sergio Neri (*apud* Imberciadori 2023: 617) suggests **i̯ou̯h₃-mó-* > **i̯ou̯mó-* (Saussure Effect) > **i̯ōmó-* with a loss of **u̯* before another labial consonant and compensatory lengthening. But the root etymology is not universally agreed upon either: Curtius (1866: 552) and then Bernhard Forssman (*apud* Darms 1978: 325) derived ζωμός from the root **i̯es-* ‘to boil’ (Gk. ζέω, *LIV*² 312–313, cf. for semantics German *Brühe* or French *bouillon*). The preform **i̯os-mó-* won’t work: ζωμοῦ κεχρημένος ‘in need of soup’ is attested in the elegiac poem by Asius (fr. 1 West), a Samian poet usually dated to the 6th cent., and in East Ionic the expected outcome of **i̯os-mó-* would have been **dᴲō̯mó-* > *ζουμός, cf. Ion. κρουνός ‘source, stream’ < **krosnó-* (= Gmc. **hraznṓ-* > ON *hrǫnn*, OE *hræn*), while an intradialectal loanword (from Laconian?) is unlikely (Dunkel 1995: 10). Curtius’s plausible etymology can be salvaged in at least two ways: on the one hand, we can posit a substantivized gerundival derivative **i̯ōs-mó-* ‘soup’ < ‘of boiling’ (← **i̯ós-mo-* ‘boiling’) and on the other hand, it is not unreasonable to speculate that a “τόμος-type” **i̯ós-mo-* ‘boiling’ > Ionic-Attic **dᴲǭ́mo-* (with a regular change of accented **-óhN-* > *-ǭ́N-*, see Peters 1984a: 86 n. 9; 1984b: 100*) could have undergone a later accent shift to **dᴲō̯mó-*, since nearly all -μος words in Greek are oxytone. Other, more outlandish explanations are possible, too. There is no need to posit either **i̯ōu̯(h₃)(s)-mó-* > **i̯ō(s)-mó-* (see **Appendix 4**) or **i̯uh₃-mó-* in order to explain ζωμός.

6. ζωρός ‘unmixed[?] (wine); strong (?)’: whatever the actual meaning of the word in Homer (*Il*. 9.203) and Empedocles (fr. 47 Wright) should be, there is no particular reason to compare the word to Ved. *jīrá-* ‘quick, speedy’ < **gʷih₃-ró-* as ‘invigorating drink’ (Germ. *erquickend*, Fr. *vif*). While *jīrá-* is often

used for liquids, its Iranian counterpart means simply 'lively, quick on uptake' (Av. *pouru.jira-* 'intelligent', *jīrō.sāra-* 'with clever head', Kurd. *žīr* 'clever'), so the association with liquids looks like an Indic innovation. Solmsen's comparison to Slavic **jarъ* 'strong, vigorous, furious, vehement' (hence 'potent, fierce (drink)') has, in my opinion, a better chance of being right (1903: 436). The absence of the effect of Hirt's Law in Slavic may suggest that there was no laryngeal before **r*: **i̯or-ó-* (> Slav. **jarъ*) → **i̯ōr-ó-* with genitival vr̥ddhi (> ζωρός, Toch. B *yāre*, see Hackstein–Habata–Bross 2019: 208) from the root **i̯er-* 'to overpower' supported by Gk. ἐπιζαρέω 'oppress, torment, force upon someone, *vergewältigen*', Mod. Cypriot πεζαρίσκουμαι 'to be overcome with anger', and, even more tentatively, by Ved. *írya-* 'active, powerful, energetical', along with the hapax nom. sg. *írī-* (RV 5.87.3) with a pejorative meaning. Just an idea.

7. λωτός 'lotus, *Nymphaea caerulea*' can continue being taken a Mediterranean LW (either Semitic, cf. Canaanite *lōṭ*, or Egyptian, cf. Coptic *r*/*lōt*) rather than **slih₃-tó-* 'blue' cognate with Lat. *līuor*, Slovenian *slīv* 'blue' (Hyllested 2004).

8. μωρός 'stupid, obtuse, foolish', Ved. *mūrá-*: rather than positing an otherwise unattested root **meu̯H-* (or comparing the onomatopoetic root of Lat. *mūtus* 'mute'), these words can be taken from the root **merH-* 'to be slow, retarded': OIr. *mer* 'mentally deficient', Hitt. *marlant-* 'stupid', Lat. *mora* 'delay'. Under this analysis, μωρός < **mōrH-ó-*, Ved. *mūrá-* < **mr̥H-ló-* (cf. Hitt. *marlant-*), see Nussbaum *apud* Nikolaev 2021. The advantage of this analysis is the possibility of bringing together words with very similar meaning under the same root of appropriate meaning.

9. οἰωνός 'large bird' was taken by Rasmussen from **h₃u̯i-h₃no-*, which is difficult because Hoffmann's suffix does not have its usual possessive meaning and because there is no evidence for **h₃* in the Anlaut of 'bird': the alleged Hitt. *šuwaiš* 'bird' has been impugned, the putative Anatolian sound law **h₃- > s-* in Anatolian is dubious, and Gk. αἰετός < **au̯i̯eto-* appears to indicate initial **h₂*. οἰωνός < PGk. **ōu̯i̯ōno-* can be explained from 'egg' (for the shortening of the diphthong see Peters 1980a: 292–305).

10. Πάν, Πάονι is clearly related to Ved. *Pūṣán-* and it is tempting to take them from the same preform, whether **puh₂-s-ón-* < **ph₂u-s-ón-* or **puh₂-s-h₁/₃ón-* < **ph₂u-s-h₁/₃ón-*, made from the root **peh₂-* (*Hirtengott*), most recently Olsen 2010: 124-125. The absence of a digamma in Arcadian (6th cent.) Πάονι if < **pu̯āhon-* does not need to be troubling. However, reflexes of a PIE *Göttername* in different languages do not have to continue the same allomorph (contrast Gk. Ἠώς and Ved. *Uṣā́s*), and there is no theoretical problem in setting up an ablauting neuter *us*-stem **peh₂-us-*, obl. **ph₂-us-* > **puh₂s-* (of the type **gʷelbʰ-us-* > YAv. *gərəbuš-*, see Malzahn 2014). Gk. Πάον- < **pāu̯on-* < **pahu̯on-* < **pau̯hon-* < **pau̯son-* < **peh₂-us-on-* is unproblematic.

11. πέπᾱμαι 'possess', πᾶμα 'possession': Olsen compares Ved. *śū́ra-* 'strong' which she takes from the root of Ved. *śavʲ-* 'swell', but this is better reconstructed as **ḱeu̯h₁-* on the evidence of Gk. κυέω = Ved. *śváyati*. The matters are very complicated, but to me it seems that the only way of accounting for πέπᾱμαι **and** all of the following forms (if they all should be related) is by reconstructing an odd – but not too odd – **ku̯ah₁-s-* 'acquire': (1) Myc. /*kwās*/ e.g. *e-to-ro-qa-ta* /Estʰlo-kkʷā(s)tās/ ~ Pind. ἐσλὰ πέπαται (García Ramón 2000); (2) Greek forms pointing to an old **s*: πολυπάμμονος, πεπαμμένω, πάσσεται, πασσάμενος, ἐπέπαστο, πέπασται, Elean πεπαστο, PNs Γυνοπαστος, Θιοπαστος, Ευπαστος (van Beek 2016); (3) Anatolian forms first compared by Gusmani 1976–7 and referring to transactional matters (see *eDiAna* s.v. where the meaning is given as 'rent'; to me

'acquire' seems just as likely in the context and is certainly possible as the etymological gloss): Lydian *qašl(i)-* 'renter[?]', Lydian *qaša-* 'fee', Lydian *qašãni* 'to rent[?]', Lycian A *qehñn-* 'rental[?]' and *qehñni-(ti)* 'to rent[?]'. (Palatalized *š* is difficult but explainable: *qašli-* < **kᵘ̯asila-* with a syncope and *qašãni* from a verbal stem in **-i̯e/o-* to which *-ãn-* is added as a secondary suffix; palatalization also possible in a hysterokinetic *n*-stem). Very important: no way around **a* for Lydian, as **o* would delabialize the preceding consonant, cf. Lyd. *kot* 'as', Hitt. *kuwatta*). To these Luwic forms Sasseville 2021: 160 plausibly compared Hitt. *kuššan-* 'fee, loan', *kuš(ša)niye/a-* 'hire' which seem to exclude **h₂* (contrast Hitt. *paḫša* < **-h₂s-*) and which, in turn, have traditionally been compared to (4) Gmc. **hūz-*, PDE *hire* < **kuHs-*. (5) **kᵘ̯ah₁-s-* will work for Lat. *quaerō* 'seek (to get), strive for' if analyzed with Nussbaum 2021: 24 as a desiderative 'seek to possess'. (6) OAlb. *kā* 'he has' has been explained by Matzinger 2003 from **kaa* < **kᵘ̯as-a* < perf. **(kᵘ̯e-)kᵘ̯as-h₂e*; **kᵘ̯ās-* would have given **ko*, probably even after contraction, so either the Albanian connection has to be abandoned (see Neri 2022 for an alternative) or **kᵘ̯as-* should be analyzed as a super-zero-grade form of sorts. More work needed.

12. σήπομαι 'to rot' under LB analysis requires an odd-looking root **kᵢ̯eᵘ̯Hp-* / **kᵢ̯uHp-* (Olsen); Lidén's comparison to Late Ved. *kyāku-* 'mushroom', Prakrit *cyāu* < Indo-Aryan **tyāku-* (1897: 51; Forssman 2011) seems much more plausible: **tᵢ̯eh₂kʷ-e/o-* > **tˢākʷ-e/o-* > σήπομαι.

* * *

Appendix 4: *Langdiphthonge* (against **ōᵘ̯C* > **ōC* in putative **gʰelōᵘ̯-neh₂*)

Between 1885 (when Johannes Schmidt and the young Wilhelm Schulze published their work on long diphthongs) and the middle of the past century monophthongization of long diphthongs had been widely employed in order to explain **ō* / **Ū* alternations where **ō* was taken to represent pre-consonantal **ō(U̯)*. However, this analysis is no longer widely accepted, see Mayrhofer 1986: 174–175; Mayrhofer 2004: 15 and Rasmussen 1989: 70: "Einen Ablaut *ō* ~ *ū* als Erscheinungsformen eines Langdiphthongs /*ōᵘ̯*/ hat es in der idg. Grundsprache allem Anschein nach nicht gegeben".

Most of the examples current in the earlier scholarship were eliminated with the advent of the laryngeal theory that allowed reconstructing **ō* (*CoH-* / *Ceh₃-*) alternating with **ū* in forms made from extended versions of the same root (*CeH-u-*, zero-grade *CH-u-* > *CuH-* > *Cū*, similarly *CH-i-* → *CiH* > *Cī*), cf. Kuryłowicz 1927: 226: "le racines à diphthongue longue ne sont le plus souvent que les élargissements de racines en voyelle longue (c'est-à-dire en *ə̯*)."

Ex. 1: Hsch. σ 2111 στώμιξ· δοκὶς ξυλίνη 'wooden beam' goes back not to **stō(ᵘ̯)-mó-* (Bechtel 1892: 274) but to **stoh₂-mo-* (cf. Russ. dial. *stamik* 'pole', Lith. *stúomas* 'height', Petit 2000: 266); Att. στοά, Lesb. στωιά 'portico' < PGk. **stōᵘ̯iᵢ̯ā-* and σταυρός go back to enlarged **steh₂-u-*.

Ex. 2: Gk. σκηνή, Dor. σκᾱνᾱ́ 'tent' goes back not to **sḱā(ᵢ̯)nā-* but to a derivative from the root **sḱeh₂-*, while Gk. σκιᾱ́ 'shade', Ved. *chāyā́-* 'id.' can be taken from **sḱeh₂-i-* (Rasmussen 1989: 61).

Ex. 3: OE *snōd* (f.) 'head-dress' < Gmc. **snō-dō-* and OIr. *snáth* (n.) 'thread' < *[TP]snō-to-* do not have to continue lengthened-grade **snō(ᵘ̯)-to-* / *-teh₂-* but can be taken from the well-established root **sneh₁-* (Lat. *nēre* 'to spin', etc.): the latter root made an *u*-present **sneh₁-u-*, pl. **snh₁-u-* > **snuh₁-*, whose various allomorphs are reflected in ON *snúa* 'to spin, to turn', Goth. *sniwan* 'come upon', OE *snōwan* 'to hasten', and Slav. *snovati* 'to warp, to go back and forth' (see Harðarson 2001: 28–32); in other words, a neo-root **sneᵘ̯h₁-* (*LIV²* 575) was formed on the basis of the present stem **sneh₁-u-*.

The examples marshalled in support of **ōU̯ > *ō* /_C where *ō* is of non-laryngeal origin are highly dubious.

(1) The nominatives of amphikinetic **-ou̯-* stems (Gk. πάτρως 'father's brother, etc.', μήτρως 'mother's brother', γάλως 'husband's sister; brother's wife', δμώς 'servant', ἥρως 'hero', ἅλως 'threshing floor') are best seen as products of remodeling based on the acc. sg. **-ōn* (< **-ou̯m* with Stang's Law) and the inflectional pattern nom. sg. *-Vs* : acc. sg. *-Vn*.

(2) The comparison between Gk. ἀλώπηξ 'fox' and Indo-Iranian **(H)raupắćă̂-* 'fox, jackal' does not necessitate a protoform **h₂lō(u̯)p-ēk̂-* for the former, since the Indo-Iranian diphthong may be secondary, as the **-u̯-* is also lacking in Lith. *lãpė*, Latv. *lapsa* 'fox' and Welsh *llywarn* 'id.' (see Höfler 2020; Palmér *et al*. 2021: 241).

(3) Gk. ζώνη 'girdle', ζῶμα 'id.', ζωστός 'girdled', YAv. *yāsta-* 'girded', Lith. *júostas* 'girded', *juosmuõ* 'waist' do not have to go back to **i̯ō(u̯)s-* (*contra* Schmitt-Brandt 1967: 81), but are now universally taken from **i̯eh₃s-*: the only evidence for a diphthong in this root is Lith. (dial.) *(pa)jūsė́ti* 'be girded' which probably has a secondary *ū* (perhaps by analogy to *mūvė́ti* 'wear pants' or by contamination with the reflexes of the root **i̯eu̯H-* of Ved. *yuváti*, AV *yáuti* 'binds').

(4) Gk. κῶμα 'deep sleep' does not have to go back to **kṓ(i̯)-mn̥* with an unexpected lengthened grade but may rather represent a remodeling of *κώ (cf. *δώ ⇒ δῶμα) taken by Garnier 2012 (= 2017: 76–77) from **kṓi̯-i* with a Stang's Law-type treatment in prevocalic sandhi.

(5) Gk. κώμη 'village, settlement' is no longer taken from **kṓ(i̯)meh₂* (~ Lith. *káimas* 'village'): see Vine 1998 for a plausible derivation from **kōm(H)-eh₂* 'compaction'.

(6) μῶμος 'blame' does not have to go back to **mōu̯-mo-* from the same root as Homeric ἀμῡ́μων 'noble', to which Hsch. μ 1867 μῦμαρ· αἶσχος. φόβος. ψόγος seems to have been backformed on the model of πεῖραρ : ἀπείρων. Heubeck 1987: ἀμῡ́μων < **h₂mu-mon-* with metrical lengthening, from the root of ἀμεύομαι 'surpass'; Wackernagel 1890: 296: μῶμος < **mŏ́mbʰ-mo-*, to μέμφομαι. Alternatively, μῶμος can be taken from **móH-mo-* < **mu̯óH-mo-* (illicit onset) and μῦμαρ / ἀμῡ́μων) from **muH-mr̥* / *-mon-* (Rasmussen 1989: 71).

(7) Gk. πλωτός 'floating', Goth. *flodus* 'flood' and Latv. *pluods* 'raft' (with a different suffix) do not have to go back to **plō(u̯)-to-*: Hom. 3 sg. aor. (ἀπ)έπλω 'sailed away' appears to require the reconstruction **pleh₃-* (cf. ἔβρω 'ate' from **gʷerh₃-*) and so does Lith. dial. *plúostas* 'river ferry' (if derived from unattested **plúoju* < **plōi̯e/o-*); if **pleh₃-* is reconstructed as a by-form of **pleu̯-*, the nominal forms above may just as well go back to **ploh₃-to-*. (Could ἔπλω be explained on the basis of a reanalyzation of PIE Narten present **plōu̯-e/o-* as **plō-u̯e/o-*, hence aor. **(e-)plō-*?).

(8) Gk. πῶλος 'foal' does not have to go back to **pō(u̯)lo-*: we can reconstruct **peh₂-u-* 'small' → **ph₂u-ló-* > **puh₂-ló-* (> Gmc. *fula-* with Dybo's Law) → **pu̯óh₂-lo-* > Gk. πῶλος, Arm. *owl* 'kid', *amowl* 'barren', see *DPEWA* s.v. *pelë* (S. Neri).

(9) Gk. φωλεός 'lair' does not need be taken from **bʰō(u̯)-lo-* (in ablaut with **bʰuh₂-leh₂-* > φῡλή 'tribe, clan, etc.') but forms a near-equation with ON *ból* 'dwelling, abode' and OIr. *baile* 'place, homestead, farm, town' < **bʰōlo-* / **bʰōli̯u̯o-*, analyzable as either **bʰoh₂-lo-* (see Rix 2003: 365) or **bʰu̯oh₂-lo-* (see Neri & Ziegler 2012: 36).

(10) Contra Bechtel 1892: 274, aor. χώσατο ‘angered, became frustrated’ does not have to go back to *$g^{h}ōu̯$-s- from the root of Ved. *ghorá-* ‘horrible’, Goth. *gaurs* ‘sorrowful’, even if the root etymology were right: χώσατο is productively made from χώομαι, cf. aor. ἐρρώσαντο (*Il.* 24.616) formed from ῥώομαι ‘move swiftly / violently’ from *$sr̥h_3$-i̯e/o-* (cf. Hitt. *šarḫiya-* ‘to press upon’, *LIV*^{2} 535), which may have influenced the formation of χώομαι (ultimately best taken from the same root as χέω, cf. Aristarch’s gloss ‘συγχέομενος’ viz. ‘*con-fūsus*’; the formation may either be deverbative or denominative from *χωή or *χωός).

(11) Gk. (Ion.) τρῶμα ‘wound’ and τρωτός ‘vulnerable’ do not have to go back to *$trō(u̯)$-$mn̥$ / -*to*-but can be much more straightforwardly taken from the root *$treh_3$-/ *$tr̥h_3$- (cf. τρώω, τιτρώσκω, τέτρωμαι); the evidence for a diphthong was sought in Att. τραῦμα ‘wound’ which, however, was given a different and convincing explanation by Peters 1980b who viewed Gk. τρώω as a reflex of the present stem *$tr̥h_3$-u̯e/o- > *trō-u̯e/o- which was reanalyzed by the speakers as *trōu̯-e/o-, leading to the emergence of a super-zero-grade analogical allomorph *trau̯- > τραῦμα (cf. χρή ~ χραισμεῖν < *k^{h}rai̯-).

(12) Bechtel also mentions the variation between Gk. θῶμα (also PN Θώμων, Θωμάντας) and θαῦμα ‘wonder, astonishment’, which, however, does not have to be explained from PIE *$d^{h}ō(u̯)$- / *$d^{h}ā(u̯)$-: the root is best reconstructed as IE *$d^{h}eh_2$-u- based on ON *dá* ‘to admire’ (< Gmc. *dawēn* < IE *$d^{h}h_2u̯$-), θέᾱ ‘sight, spectacle’ < *$d^{h}eh_2u̯eh_2$-, while Attic θαῦμα would be a regular reflex of *$d^{h}eh_2u$-$mn̥$; Ion. θῶμα has been explained by Peters 1980b as a product of the following analogical proportion: Attic τραῦμα : Ionic τρῶμα = Attic θαῦμα : X, where X is resolved as Ionic θῶμα.

(13) Despite Osthoff 1905: 249–258 and Wissmann 1952: 19–27, Gk. φηγός, Lat. *fāgus* and Gmc. *bōkō-* ‘beech’ should be taken not from *$b^{h}ā(u̯)g/ĝ$-o- but from *$b^{h}eh_2g/ĝ$-o- (possibly next to a root noun *$b^{h}eh_2g/ĝ$-): Slav. *buz- / *bъzъ ‘elderberry’ is semantically too far, the testimony of Kurdish *būz* was invalidated by Eilers & Mayrhofer 1962, the putative Germanic evidence for *bauk- / *buk- (Icel. *beyki* ‘beech’, etc.) was dismissed by Lane 1967 (whose article remains an important rejoinder to the Neogrammarian theory of long diphthongs), and Alb. *bung* can go back to *bugna- < *bogna < *$b^{h}āgnā$- (see Demiraj 1997: 113).

(14) The final Greek example, adduced by Bechtel and Schwyzer, is the Theophrastean hapax τρώξανα ‘dry[?] twigs’ (*HP* 3.2.2) vis-à-vis ταύξανα ‘dry chips’, the etymology of which is uncertain; a contamination with θραύω ‘crumble, break’ may be responsible for the diphthong (see Frisk 1960–1972: 2.919; the word may in fact be non-Indo-European, since the derivation from τρώγω ‘gnaw’ is semantically difficult, see also Beekes 2014: 57).

(15) The PIE word for ‘mouth’ (Lat. *ōs*, Ved. *ā́s-*, Luw. *āšš-*, OIr. *á*, etc.), whatever the precise reconstruction of the root (see Wodtko et al. 2008: 387–390, Melchert 2010 and Ligorio 2019), does not need to be derived from *$ōu̯s$- (e.g. Schmidt 1889: 221): the forms with a diphthong, such as Ved. *óṣṭha-* ‘(upper) lip’, YAv. *aošta-* ‘id.’, OPruss. *austo* ‘mouth’, OCS *usta* (pl.) ‘mouth’, can go back to a derivative from the same root but with a different suffix, viz. *h_xoh_x-us- → *h_xoh_x-us-teh$_2$ → *h_xoh_x-us-th$_2$-ó-, as first proposed by Lindeman 1967.

(16) There is no reason to project the Germanic alternation *gōman- ~ *gauman- back to the PIE: the comparanda point to *$g^{h}eh_2m$- ‘palate, gums’ (ON *gómr*, Lith. *gomurỹs*) and the evidence for a diphthong, limited to German (where next to OHG *guomo* we find *goumo* and *giumo*), is explicable otherwise, see Neri 2016: 11; in any event, as the Baltic data show, the word probably goes back to a laryngeal-final root (*$ĝ^{h}eh_2$- ‘to gape’ with a *Gutturalwechsel* in Baltic?), not to *$g^{h}ō(u̯)$-.

(17) Schulze 1885: 428 saw an example of PIE monophthongization in "**oktōbhis*" (< **okt̂ōu̯-bʰis*) apparently mechanicaly reconstructed on the basis of Ved. instr. *aṣṭābhíḥ* '8' (RV 2.18.4), but this view is indefensible: the Vedic form (with a plural ending) is clearly an innovation, cf. Av. indeclinable *ašta* (instr./ gen.), and there is no reason to think that '8' was declined in PIE. The precise reconstruction of the cardinal (Ved. *aṣṭā(v)*, Goth. *ahtau*) is uncertain, but it is rather unlikely that the form was an **ou̯*-stem (as Fritz 2011: 211 assumes, probably misunderstanding Cowgill 1985: 26) rather than, as is now widely agreed, contained a laryngeal, e.g. **(hx)okt̂eh3u-* (Rix 1992: 172) or **(hx)okt̂oh1u-* (Malzahn 2000: 215 and *passim*, Neri 2017: 92; Klingenschmitt 1994: 387 n. 129, 2022: 92).

(18) Finally, Ved. *syālá-* 'wife's brother' (next to Slav. **šurъ* 'id.' (*jo*-stem) < Proto-Slav. **si̯au̯ri̯as*) was derived from **si̯ō(u̯)l-o-* by Hoffmann 1896: 140 and — very tentatively — from **si̯ēHuró-* with ĒHUC > ĒUC > ĒC by Schindler 1969: 165, but other explanations are available. The appurtenance of Slav. **šurъ* is not certain: since the reflexes of PIE tautosyllabic **eu̯* and **i̯eu̯* are identical in Slavic (cf. **seu̯-i̯ó-* > *šujь* 'left'), **šurъ* can in principle go back to **seu̯ri̯o-*, possibly derived either from **seu̯-ro-* 'close relative[?]' from PIE **seu̯-* 'squeeze[?]' (cf. Lith. *siaũras*, Latv. *šàurs* 'narrow, tight, close': Pedersen (1934–1935: 152–153) or, somewhat more plausibly, from reflexive **su̯e-* 'self' (cf. ON *svilar* 'husbands of two sisters', Russ. *svojak* 'husband of wife's sister', Lith. *sváinis* 'wife's or husband's brother; wife's sister's husband', Arm. *kʿeni* 'wife's sister', etc.). Even if **šurъ* is related, its diphthong (Proto-Slav. **si̯au̯ri̯as*) could be due to analogy to **ujь* (*jo*-stem) 'uncle on mother's side' < Proto-Slav. **au̯i̯as*, Lith. *avýnas* (Viredaz 2020: 417). Without the evidence for a diphthong, Ved. *syālá-* is best taken from **si̯ŏ̄ró-* made from the root **si̯er-*, as reconstructed by Klingenschmitt 1972: 11 (see also Klingenschmitt 2008: 405–406, where a different reconstruction **si̯eh1-* is mentioned, probably related to his student's solution: Rasmussen 1989: 74 **si̯eH-ů̯*). This **si̯er-* could account for Arm. *hor* (*i*-stem) 'daughter's husband', although it is unclear whether either **si̯ori-* or **siu̯ori-* can give the Armenian form (the assumption that tautosyllabic **si̯* gave *h* before a back vowel cannot be independently verified or counterexemplified). A different etymology of *hor* was proposed by Djahukian 1969: 70 (< **seu̯ero-* / **seu̯otero-*).

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