



Initial h_3 in Anatolian and PIE: Regularity in Ostensible Chaos

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0. Introduction

The problem of the reflexes of PIE initial $*h_3$ ($*h_3^\circ$) in the older Anatolian languages (Hittite, Luvian, and Palaic) has remained unresolved. Oettinger (2004:397):

“Das Schicksal des dritten Laryngals in den ältesten Idiomen des Anatolischen, also des Hethitischen, Luwischen und Palaischen, gehört zu den wichtigsten noch ungelösten Problemen der Lautlehre dieser Sprachen Während ... der Schwund von h_3 im Inlaut und Auslaut des Uranatolischen feststeht, und der Verlust dieses Lautes auch im Anlaut beim Lykischen ... und Lydischen sicher ist, scheinen beim Anlaut der älteren anatolischen Sprachen überzeugende Beispiele sowohl für Bewahrung als auch für Schwund von h_3 zu existieren.”

Open questions:

- Is there at least one unassailable example of $*h_3^\circ > (\text{older}) \text{Anat. } h$?
- If indeed the development $*h_3^\circ > h$ is convincingly attested, is there regularity in the outcome?
- Is there regularity in the outcome $*h_3^\circ > \emptyset$?
- Are other outcomes possible, and if so, what are they and are they regular?
- If there is, in fact, regularity, what exactly do the rules and conditioning factors that govern these outcomes look like in Hittite and Luvian (and, to the extent that the scarcity of data allows us to judge, in Palaic)?
- What can we determine for Lycian, Lydian, and the other first-millennium Anatolian languages?

This presentation attempts to answer these questions definitively. Doing so requires

- discussion of what sort of evidence is generally considered criterial;
- careful reexamination, reworking, and sometimes rejection of a good deal of the standard material and the explanations thereof;
- the use of statistical analysis;
- the use of material and explanations from languages that are far removed in space and/or time; and
- analysis of the relevant phonetics, especially as regards distinctive features and distinguishability.

In the process of answering the questions, important generalizations emerge, relevant to Anatolian and beyond. We are, in fact, led to the

- positing of a new rule of PIE phonology,
- refinement and extension of a rule of Anatolian phonology previously suggested by other researchers, and
- positing of a new development in (Pre-)Greek phonology.

1. Traditional Evidence for $*h_3^\circ$ in the Older Anatolian Languages

1.1. The sort of evidence that can be considered criterial for even the presence of $*h_3^\circ$ in a root in Anatolian turns out to be difficult to find for the following reasons:

- $*h_3$ is by far the least common of the three laryngeals.
- Obviously, not all items with PIE $*h_3^\circ$ are preserved in Anatolian.
- Only Greek allows, via the identity of the “prothetic” vowel remaining after the initial laryngeal is deleted, the distinguishing of the three laryngeals in initial position before consonants.
- There is general agreement that in Anatolian $*h_1 > \emptyset$ and, generally, $*h_2^\circ > h$. However, an older Anatolian word beginning with *ha* can, at least in theory, reflect any of the following initial PIE sequences: / h_2e /, / h_2o /, / h_2 / before consonant, / h_3e /, / h_3o /, / h_3 / before consonant.
- An older Anatolian word beginning with a vowel may have developed from a form with an initial $*h_1$ or $*h_3$, or, in certain environments, $*h_2$.

1.2. PIE ‘bone’: $*h_2^\circ$ or $*h_3^\circ$?

- Anatolian: Hitt. *hastāi-* ‘bone(s)’, Luv. *hās(sa)* ‘bone’.
- PIE etymon?
 - $*h_2^\circ$
 - Melchert (1994:243): $*h_2óst$
 - Mallory & Adams (1997:77): $*h_2óst-$ (gen. $*h_2ésts$)
 - Watkins (2000:61): $*h_2ost-$, $*h_2est-$
 - Kimball (1999:142): [hastāi] < Pre-Hitt. $*h_2astōi$ for coll. $*h_2ést(H)-ōi$, etc.
 - $*h_3^\circ$
 - Kortlandt (2001): initial $*h_3é$ (in keeping with his position [p. 4] that initial $*h_2-$ and $*h_3-$ were preserved before $*-e-$ and lost before $*-o-$ in Anatolian)
 - Schrijver (1991:50).
- Compelling evidence for $*h_2^\circ$
 - Mallory & Adams (1997:77): OIr. *asna* ~ *esna* (< $*h_2estniyo-$ ‘rib’); MWelsh *eis(en)* (< $*h_2estōn$) ‘ribs’.

- Katz (1998:213 fn. 86): “ ... Gk. *ὀστέον* ... goes back to something like **h₂est-ŕ-g-ŕ-o-* and must have e-grade vocalism in the root (cf. *ὀστέον* ‘bone,’ etc. < **h₂ost-* ...). ”
- Kimball (1999:392): **h₂* rather than **h₃*—**a* of W. *asgwynn* ‘bone’ ... and *o* : *a* in Gr. *ostéon* : *ástraka*.
- Katz (1997:74–76 and passim): **h₂ést* < Toch B. *āy* ‘bone’.

Clearly, the Celtic, Greek, and Tocharian vocalism (Celt. *a* ~ *e*, Gk. *o* ~ *a*, Toch. B *a*) requires *h₂^o*.

1.3. PIE ‘eagle’: **h₃^o* (?).

- Anatolian: Hitt. *hāras*, *hāran-*, Pal. *hāras* (gen. *hāranas*) ‘eagle’.
- PIE etymon?
 - **h₃^o*
 - Melchert (1994:98): **h₃éron*; Katz (2004:199).
 - Kimball (1999:141): [*hāras*] < P.-Anat. **h₃órō-s*.
 - Kortlandt (2001): initial **h₃e* (which in his framework is the only way to derive both the Gk. *o* and the Anat. *ha*).
 - **h₃^o* likely, but not completely secure.
 - **h₂o^o* not excludable phonologically
 - Rasmussen (1999b:519 [1992], referring to Melchert [1987]).
 - Zeilfelder (1997:190).
 - But **h₃^o* probable on morphological grounds
 - Normally taken to be amphikinetic *n*-stem (see, e.g., Szemerényi [1996:168–170] and Rieken [1999:404]).
 - However, nothing in the literature totally precludes **h₂^o* or *o*-grade from this stem-type. Oettinger (1995:219) and Ofitsch (1995:20) explicitly allow both possibilities.

We ourselves advocate the reconstruction of **h₃^o* in this item—which, we argue, yields Hitt. *h* except in specific environments—a position for which we provide additional evidence below.

2. Rejection of the Hypothesis of “Chaos” in the Hittite Reflexes of **h₃^o*

2.1. Rasmussen (1999b [1992]): **h₃^o* > Hitt. *h* ~ Ø (unpredictably).

“Hittite *h-*, as in *harganau-*, *hapus-*, and *zero*; as in *utne-*, *ekuzi*, *arai-* are both compelling: IE **h₃-* is reflected in Hitt. as an *unstable h-....*” (p. 519).

2.2. p. 520:

“An *h-* is notoriously an unstable kind of sound If **h₁-* which was certainly a plain [h-] in the proto-language has been lost in Anatolian, while **h₂-* is retained as the velar spirant [x-] it probably was from the beginning, it is hard to predict whether the voiced lenis spirant **h₃-* (phonetically in my opinion [ɣ^w-]) would fall in with one of the two others (and, if so, with which one) or would instead present a Cockney-like

instability, giving now /h-/ (of whatever exact phonetic kind), now zero.... I believe the Cockney solution is the only one that fits the facts."

But situation in Hittite \neq Cockney English.

- Cockney has no /h/, so a word may or may not be instantiated with a phonetically breathy onset (i.e., [h])—regardless of whether it had an /h/ at an earlier stage
- Hittite is completely different: An item has an /h/ at its beginning or it does not.

2.3. *hapus-*

- Rasmussen (1999b: 519 [1992]): " ... *hapus-* 'shaft, penis' : Gk. *οπιω* 'marry', the latter being a simple denominative $*h_3pus-i\check{o}$." (If correct, at least one instance of $*h_3^{\circ} > h$ is secure for Hittite, since the Greek form would guarantee $*h_3^{\circ}$.) But ...
- Zeilfelder (1997): powerful case—orthographically, morphologically, semantically, stylistically—against a relationship between the Hittite and Greek items.
- Kloekhorst (2005): strong arguments for the Hitt. form actually being *ḫāpūša(šš)-*, meaning 'shaft (of an arrow), stem (of reed), shinbone'. Moreover (p. 38):
 "... [W]e are probably dealing with a substratum word, because of the very un-IE looking stem *ḫāpūša(šš)-* (I know of no other stems ending in a geminate -šš-)."

In sum, the Hitt. item may be a loan, or (if from PIE) may reflect either $*h_3^{\circ}$ or $*h_2^{\circ}$ —thus not probative.

2.4. *harganau-*

- Rasmussen (1999b: 519) [1992]) finds *harganau-* to be convincing evidence for $*h_3^{\circ} > h$.
- Almost all authorities agree with this connection, but Zeilfelder (1997:189–190) is largely negative.

We are inclined to side with the majority position, but Zeilfelder's points are significant enough that we have to call the proposed connection insecure.

2.5. This exhausts the traditional evidential material. Our conclusion (at least temporarily): there is no **completely** secure example in that material of $*h_3^{\circ} > \text{Hitt. } h$. Now on to the items in Rasmussen (1999b [1992]) for.

2.6. ($*h_3^{\circ} > \emptyset$) Rasmussen begins with *utne-* (p. 520):

I do not see how one can avoid a word-initial $*h_3-$ before the vowel of Hitt. *utne-* n. 'land, country' which is obviously connected with Gk. *οὔδας* 'ground, floor' and Arm. *getin* 'ground' (o-stem). The root must be $*h_3yed-$ with its vowel between the /y/ and the /d/ (Vollstufe II) as *getin* shows, so that Gk. *οὔδ-* must reflect the corresponding zero-grade sequence $*h_3ud-$.

We believe, however, that such a connection can—and indeed should—be avoided. We find the arguments in Oettinger (2000) convincing. Oettinger (2000:182–183), concurring with Melchert (1994:161):

Zucha (1988:300f.) suggests a secondary derivative from **wed(e)n*, the weak stem of ‘water’: **wed(e)n-o-* ‘of water’ > ‘watered land’ (with substantivization in Arm. *getin* and substantivizing *-i-* in Hitt. **wedn-i-*, as elsewhere). Compare for the semantics Cluv. *hapat(i)* ‘(river) valley’. Hitt. *udnē*, *udny-* would be a collective to *wedn-i-*. Whether one accepts the precise derivation or not, the Armenian word does suggest that the *-dn-* in the Hittite reflects an ablauting base where the **-dh-* cluster was not uniform, hence the preservation. It still seems possible (though hardly necessary) to relate Grk. *édaphos* ‘ground, bottom’. Adding *oûdas* ‘ground’ seems difficult, but compare Hamp (1969:10).... For a very different analysis of ‘earth’ see Hamp (1969) and Rasmussen (1992:59f.), neither of whom I can follow..

Oettinger offers a few modifications and expansions of this position, and notes specifically (p. 184):

Arm. *getin* ‘Land’ setzt ebenfalls ein **wedeno-* ‘Land’ fort.... Insofern trifft Melcherts (s.o. 2.2.) typologischer Vergleich mit luw. *hapati-* ‘Land’, das ja etymologisch zu *hap-* ‘Fluß’ gehört, ins Schwarze.... Etymologisch ist dieses **wedeno-* ebenso wie anatolisch **wedeno-* jeweils vom Obliquusstamm des früheinzelsprachlichen Wortes für ‘Wasser’ abgeleitet; das uridg. **wód-r̥*, Gen. *wéd-n̥-s* ‘Wasser’ (voreinzelsprachlich auch ‘Wasserlauf’; vgl. arm. *get* ‘Fluß’) forsetzt.

Rejecting **h₃^o* in *utne-/udnē* is therefore quite feasible, and we would be on firmer ground, so to speak, if we could supply an alternative etymology for *oûdas*. One such alternative is given in Hamp (1969:10), who links it with *édaphos*, which he also derives from the ‘water’-word, thereby maintaining the connection with *utne-/udnē*, but without the need for an initial laryngeal.

2.7. *ekuzi* (op. cit.:521):

I have myself (Rasmussen 1988:80f) suggested the refinement of Puhvel’s combination of Hitt. *ekuzi/eukzi* ‘drinks’, 3pl *akuwanzi*, with Lat. *ēbrius* ‘drunk’ and *sōbrius* ‘sober’ (Puhvel 1984:261–68 and again 1986:193–96) by positing a root **h₃eg^{wh}-*, whence **se-* + **h₃(e)g^{wh}-ri-o-s* > PIE **soh₃(o)g^{wh}ri-o-s* ‘without drinking’ and a vrddhi adjective **h₃ēg^{wh}ri-o-s* ‘characterized by drinking’, this giving free of charge a smooth analysis of the verb as a “Narten present” **h₃ēgwh-nti* > *akuwanzi*. This would also demand a development **h₃-* > Ø- in Hittite.

Problems with Rasmussen’s analysis:

- (a subtle one) of all the IE cognates, only *sōbrius* gives any indication (via its *o*) that we might be dealing with **h₃^o* rather than **h₁^o*.
- LIV²:231 and Mallory & Adams (1997:175), e.g., < **h₁^o*.
- Kim (2000a:165, e.g.): **(h₁)ēh₂g^{wh}-*, but no comment about the vocalism of *sōbrius*.

- However, Watkins (2000:87 s.v. *s(w)e-* ‘pronoun of the third person and reflexive ...’) etymologizes Lat. *sōbrius* ‘not drunk’ as a compound of *s(w)e-* in the “suffixed form **s(u)w-o-* ‘one’s own’ + *ēbrius* ‘drunk’ ...”.

So Rasmussen’s analysis, though seductive, turns out to be unconvincing.

2.8. *arai-* (loc. cit.):

If Hittite *arai-* really means ‘(a)rise, lift; raise, (a)rouse ...’ as Puhvel 1984:123 translates and as his many textual quotations strongly support ..., there is little chance of its not being related to Gk. *ἀρνύμι* ‘arise, start’ and *ἀρνύω* ‘arouse’ and Lat. *orior* ‘start, originate’ (cf. Puhvel 1984:167, equating Hitt. *armuzi* with Gk. *ἀρνύομαι* and Skt. *ṛnóti* in continuation of a long tradition). Whatever the exact shape of the many individual derivatives from the root concerned, an initial **h₃r-*/**h₃or-* is everywhere inescapable.

- (If indeed < **h₃°*) we would still agree with Oettinger (2004) in attributing the absence of a reflex of **h₃°* in Hitt. *arāi* ‘erhebt sich’ to “Saussure-Hirt’s Law” in Anatolian. Oettinger (2004:403, e.g.):

Hittite *arāi* ‘rises’ is from **h₃róy-e* + *i*. The laryngeal disappears in this special case according to the law of de Saussure and Hirt. The root **h₃rei-*, is derived from I-E. **h₃er-* ‘to rise’ by adding -y. So preservation of *h₃-* in initial position can be accepted as a rule for the older Anatolian languages....

Thus this may well be an example of **h₃° > Ø*, but if so, it represents a rule-governed development in a specific phonological environment and so does not constitute evidence against *h* as the unmarked reflex in older Anatolian.

3. **h₃° > š* in Hittite; **h₃° > t/d* in Luvian; **h₃° > t* in Lycian, Milyan; **h₃° > š* in Lydian

3.1. We are convinced by the evidence that, initially, **h₃ > š* in Hittite, **h₃ > t/d* in Luvian. Olsen (1992) cites Schindler (1969), but goes far beyond his analysis and adduces new data. She points out, i.a., (pp. 16–17)

- four Hittite items beginning with *š* where “... there is independent motivation for identifying the initial phoneme as IE **h₃-*, and they all contain a labial or labiovelar element”;
- the possible equation of Luv. *tawi-/dawi-* ‘eye’ with Hitt. *šakarwa* ‘eyes’;
- the change, via dissimilation and palatalization, of **h₃* (which she notes “... can be reasonably assumed to have been a voiced labiovelar spirant [ɣ^w] in IE ...”) to Luv. <ɫ/d> (perhaps representing [dʒ]) and Hitt. <š> (perhaps representing [ʒ] or [ʃ]); and

Olsen (2006) reprises her 1992 article and expands it significantly. During the period Olsen’s paper was in press, Hart (2004) was published.

- Both Olsen (2006) and Hart (2004), adducing almost the same material, give strong arguments for the clearly related Hittite and Luvian developments, with

- Olsen suggesting their occurrence in the presence of labials and labiovelars;
- Hart concluding, similarly, that the presence of /u/, /w/ is involved.
- We will now summarize the relevant portions of Olsen and Hart,
 - showing that Olsen's view of the phonological conditioning of the development is nearer the mark;
 - establishing a refinement that makes the conditioning more precise;
 - in turn allowing us to posit the connection to be a regular sound law.

3.2. Olsen (2006) discusses six Hittite items beginning with *š* that show indications of the presence of initial **h₃*; she gives probable Luvian cognates beginning with *t/d* for three of these. Hart (2004) discusses five of the six Hittite items (the analysis of the sixth item—which is one of the three having potential Luvian cognates with *t/d*—is originated by Olsen); Hart, like Olsen, gives potential Luvian cognates for the other two items and, in addition, originates an analysis that gives a potential Luvian cognate with initial *t* for another of the Hittite items.

- Olsen: Hitt. *šuwaiš* 'bird'. Hart: id.
 - Olsen gives as cognate "... Gk. οἰωνός (**h₃iū-h₃n(h₂)-ó-s*) 'bird of prey' suggesting IE *h₃aii-/h₃ui-* ...". and "... the alternative explanation of Hitt. *š-* implies an otherwise unknown case of mobile **s-* and a development **sh- > *š-....*"
 - Hart: "... it is not entirely clear whether **h₂* or **h₃* should be posited. Greek presents conflicting evidence with οἰωνός 'bird of prey, ominous bird' as against αἰετός 'eagle'....", and "[t]he problem of the Greek forms remains so far unresolved."
- Olsen: Hitt. *šakui-*, *šakuwa-* 'eye; hole', *šakuwai-*, *šakuwaya-* 'see, look, regard', et al.; Luv. *tāwa/i-* 'eye', *tāwīyan* 'facing, toward', *dawalli(ya)-* 'cast the evil eye upon'. Hart: Hitt. *šakuwa*, *šakui-* 'eye(s)', Luv. *da-a-u-wa*, *da-a-u-iš* 'id.'.
 - Olsen: "... an IE root noun **h₃ok^w-* ...", and the Anatolian items are "... traditionally derived from the root **sek^w-* 'follow' ... though ... the words for 'eye(s)' and 'fingernail, toenail' (cf. *šankuwai-*, *šankui-* below) may both be derived from a mobile **s-* + root initial **-h₃-*. Again, this element would be an isolated Anatolian phenomenon...."
 - Hart's remarks are in keeping with Olsen's, and she notes crucially:

"The initial <š> of the Hittite word has sometimes been explained by assuming an 's-mobile' before the laryngeal.... Even if it can be defended, it would work only if the Hittite-Luvian correspondence were rejected."
- Olsen: Hitt. *šankuwai-*, *šankui-* 'fingernail, toenail', ^(URUDU)*šankuwal(li)-*, *šakkuwal-* 'a metal implement for care of the nails(?)'. Hart: Hitt. *šankuwai-* 'nail' of finger or toe; Luv. *ta-am-mu-u-ga* (*tammūga*) 'nails'.
 - Olsen (p. 3 fn. 11): IE **h₃nog^hu-/ *h₃ng^hu-*; and

"According to Mayrhofer (EWAia I: 49) Skt. *ānghri-* 'foot' is best understood as a *vrddhi* formation which would account for the semantic variation between base word and derivative. Therefore *śankuwait-* is preferably derived from a zero grade **h₃ng^hu-...*".

▪ Hart:

... Hittite goes with Italic and Celtic in having a form of the root with no vowel between the nasal and the final consonant (**h₃ng^hh-*) It has been traditional to reconstruct the root as **nogh(w)*, *ngh(w)* but in the light of more recent research a root-final labiovelar **-g^hh* seems more likely....

With respect to Luv. *tammūga*:

The phonological development is complex. In the absence of counterexamples it may be assumed that before a nasal **g^hh* became /gw/, exactly as in Lat. *ninguit* 'it snows', beside *nix*, *nivis* 'snow'. Next came assimilation of the nasal of the root to the following gw, giving pre-Luvian **tamgwa*. For a not dissimilar kind of change compare Tocharian A *makw*, B *mekwa* 'nail'.

- Olsen: Hitt. *śarhuwant-* 'womb, foetus'. Hart: id. 'insides, belly, womb, embryo'.

- Olsen writes: "... if connected with Gk. *ὀρῦα* f. 'intestine, gut' (Schindler l.c.), from IE **h₃(o)rh₂u-...*".
- Hart writes, similarly, that the item "... was compared by J. Schindler (1969: 159) with Greek *ὀρῦα* 'sausage'. The comparison seems unobjectionable."

- Olsen: Hitt. *śagan* 'oil, fat', *śakniya-* 'anoint, smear', *śaknuwant-*, *śakuwant-* 'oily, fatty'; Luv. *tāin* 'oil, fat', *dāini(ya)-* 'of oil, oily'. (Hart does not give this item.)

- Olsen notes that *śagan* is

"... also about oil 'used for anointing ...' and writes that the item is "..., if historically connected with Lat. *unguen* 'ointment' etc., from IE **h₃ng^h-...*". She continues: "A morphologically meaningful, but etymologically unclear interpretation is offered by Oettinger (2003:340) who derives the neuter *śagan* from **sog^hh*, while the apparently related Luvian *tāin* 'oil, fat' ... is assumed to reflect the corresponding collective **sog^hh*.... As an adjustment of this analysis we may now suggest a reconstruction neuter **h₃óng^hh* vs. collective **h₃ng^hēh*"

- Olsen: Hitt. *śēhiur* 'urine'; Luv. *dūr-/dūn-* 'id.'. Hart: Hitt. *še-(e)-hur*, Luv. *du-ū-ur* 'urine'.

- Olsen argues for an etymological relationship with "... Gk. *οὐρον* 'urine', *οὐρέω* 'urinate', Lat. *ūrīna* ..." and writes: "The original paradigm would seem to be a heteroclitic **h₃ēh₂ur* where the weak stem form **h₃h₂un- > *h₃uh₂n-* was analogically levelled to **h₃uh₂r-*, the basis of the thematized **h₃úh₂ro- > Gk. *οὐρον*... and the potentially identical ON *úr* n. 'drizzling rain' ...".*

now w last?

- Hart: “The identification of these words [i.e., the Hitt. and Luv. items] is attractive. F. Starke (1990:568–70) made out a strong case in its favour because of inflectional morphology, meaning, and appearance in similar contexts, but found the phonological difficulties insuperable....”

Olsen writes about these six sets (p. 8):

In all six cases ... there is independent motivation for identifying the initial phoneme as IE **h₃-*, and at the same time they all contain a labial or labiovelar. Obviously *š-* is not the usual outcome of IE **h₃-* which is variously maintained to give either *h-* or zero.... It would therefore require very particular phonetic conditions for the reflex of **h₃-* to be written as a sibilant. This gives an unexpected relevance to the common feature of labiality: the /u/, /w/ of *šurwais*, *šankurwais*, *šarhuwant-* and *šēhur*, the /kʷ/ of *šakuwa* and the original /gʷ/ of *šagan* if the proposed etymology is correct.

As Hart has noted, a position involving *s*-mobile has no explanation for the *t/d* in the Luvian cognates, since **s* > Luvian *s*; whereas if the Hittite and Luvian initial phonemes are the end results of a sound change (of **h₃*), the situation is completely unremarkable.

Olsen (pp. 8ff.) discusses the development of $*h_3^o > \check{s}$ in Hittite, t/d in Luvian as a dissimilation of $/*h_3/$ —which she (and Hart and we), following Rasmussen (1994, 1999 [1983], 1999b [1992]), would reconstruct as the voiced, rounded velar fricative $[y^w]$ —in items that “... all contain a labial or labiovelar element ...” and “... in labial environments ...”. However, she believes it would have to have been a sporadic occurrence, writing (p. 9f.) that “... a sound law explaining the examples listed above would have to be highly idiosyncratic. We cannot simply postulate a general dissimilation and palatalization of initial $*h_3$, i.e. $[y^w]$, in connection with following labials as this would offend against examples like $*h_3ud- > utne$...; $*h_3pus > hapus(s)a$ ‘penis’ ~ Gk. $\delta\pi\upsilon\acute{\iota}\omega$ ‘mount, marry’; $*h_3op- > hapzi$ ‘is rich’; perhaps $*h_3op- > happēna$ ‘baking kiln, fire-pit, broiler oven’ ~ Gk. $\delta\pi\tau\acute{\rho}\varsigma$ ‘roasted’”. She goes on to write (loc. cit.): “... the divergent treatment of $*h_3-$... seems to indicate that the element triggering the development to Hittite \check{s} -, Luvian t/d - would not only have to be labial, but also rounded, i.e. $/u/$, $/w/$ or a labiovelar.”

We see the process as a clear-cut dissimilation also. It turns out, moreover, that a small but significant refinement of Olsen's analysis allows the development to be reformulated as a regular sound law. The key point is that $*h_3^\circ$ yields Hitt. \check{s} and Luv. t/d **if and only if** a labiovelar obstruent or a [w] occurs later in the root. With this refinement, all of Olsen's examples quoted in the preceding paragraph become irrelevant to the rule. The class of PIE labiovelar consonants comprises k^w , g^w , g^{wh} , h_3 , and w . We will write the reformulated rule as $*h_3 > \{\text{Hitt. } \check{s}, \text{Luv. } t/d\} / ______ X \text{labiovelar } Y$, where X and Y are arbitrary (possibly null) phone strings, and, for easier reference hereinafter, call it the *Anatolian dissimilation rule*.

We emphasize that we believe this reformulated rule to be a sound law and not just a sporadic dissimilation. One thing that this position implies is that where initial Hitt. *š* and/or Luv. *t/d* correspond to the reflex of a laryngeal in any of the extra-Anatolian

IE daughter-languages (and the etymon contains a labiovelar consonant triggering the rule) that laryngeal must have been $*h_3$. And, equally, if a PIE root beginning with a laryngeal and having a labiovelar later in the root has a Hittite reflex without an initial \check{s} and/or a Luvian reflex without an initial t/d , that laryngeal must not have been $*h_3$. A case in point is the PIE 'drink'-word: Its Hittite and Luvian reflexes of, respectively, *eku-/aku-* and *aku-* clinch the argument that it must have begun with $*h_1$, and not $*h_3$.

A detailed discussion Hitt. *šagan* 'oil, fat', Luv. *tān* 'oil, fat', etc. Until recently, the uncontroversial standard reconstruction for the relevant IE root was $*h_3eng^w-$. But an ingenious and compelling etymology put forth by Janda (2000:282–287) has changed matters. He shows convincingly that three Greek forms associated with Dionysos, *διθύραμβος*, *θρίαμβος*, and *ίαμβος*, previously having generally been thought to be of non-IE provenience, are actually compounds that share the root *αμβο-*, which is in fact the Greek reflex of the PIE 'anoint'-root. Janda therefore revises that root to be $*h_2eng^w-$. The conundrum for our position is, of course, that *αμβο-* requires its etymon to have begun with $*h_2$ rather than $*h_3$, and this is in opposition to the Hittite and Luvian cognates which, contrariwise, require their etymon to have begun with $*h_3$ rather than $*h_2$. Our solution is very much in keeping with our other proposals herein. We believe that in (Pre-)Greek there was a dissimilation of the $*h_3$ of $*h_3eng^w-$ to $*h_2$, caused by the presence of $*g^w$. We note in passing that our solution has as a side benefit the elimination of any need to resort to analogy for explaining the Italic reflexes of this root.

Developments yielding the following 8 attested lexical items (and bibliographic references and comments)	Hitt. <i>šakui-</i> , <i>šakuwa-</i> 'eye'	Luv. <i>tāwālī</i> 'eye'	Hitt. <i>šēkur</i> 'urine'	Luv. <i>dur</i> (<i>dūr</i>) 'urine'	Hitt. <i>šankuwai-</i> , <i>šankui-</i> 'fingernail, toenail'	Luv. <i>tammūga</i> 'nails' or 'nail-clippings'	Hitt. <i>šagan</i> 'oil, fat'	Luv. <i>tāin</i> / <i>tāin</i> 'fat'
[Starting points]	PIE *h ₃ ok ^w - 'eye'	PIE *h ₃ ok ^w - 'eye'	PIE *h ₃ ēh ₂ ur 'urine'	PIE *h ₃ ēh ₂ ur 'urine'	PIE *h ₃ ng ^h u- 'fingernail, toenail'	PIE *h ₃ ng ^h u- 'fingernail, toenail'	PIE *h ₃ óng ^w ŋ 'fat, butter, salve, etc.'	PIE *h ₃ ng ^w ēn 'fat, butter, salve, etc. (collective)'
PAnat.: Stage 1 of the Anatolian dissimilation rule; (see above)	PAnat. *(d)žok ^w -V	PAnat. *(d)žok ^w -V	PAnat. *(d)žēh ₂ ur	PAnat. *(d)žēh ₂ ur	PAnat. *(d)žng ^h u-a	PAnat. *(d)žng ^h u-a	PAnat. *(d)žóng ^w ŋ	PAnat. *(d)žng ^w ēn
PAnat.: h ₂ > h — i.e., a voiceless "back" fricative (we opt for [x], but it might have been something else); (see Melchert [1994:68] and Discussion 1)	N/A	N/A	PAnat. *(d)žēh ₂ ur	PAnat. *(d)žēh ₂ ur	N/A	N/A	N/A	N/A
PAnat.: h is voiced after an accented long vowel (not distinguished in spelling); (see Melchert [1994:68])	N/A	N/A	PAnat. *(d)žēh ₂ ur	PAnat. *(d)žēh ₂ ur	N/A	N/A	N/A	N/A
PAnat.: k ^w > g ^w	PAnat. *(d)žog ^w -V	PAnat. *(d)žog ^w -	N/A	N/A	N/A	N/A	N/A	N/A

medially; (see Melchert [1994:61])		V						
PAnat.: g ^w > g / Nasal _ (Vowel) Nasal; (posited hereby; see Discussion 2 below)	N/A	N/A	N/A	N/A	N/A	N/A	PAnat. *(d)žóngŋ	PAnat. *(d)žngěn
PAnat.: Loss of distinctive aspiration in stops; (see Melchert [1994:60])	N/A	N/A	N/A	N/A	PAnat. *(d)žngŋ-a	PAnat. *(d)žngŋ-a	N/A	N/A
PAnat.: Reinter- pretation of gw as g ^w ; (posited hereby)	N/A	N/A	N/A	N/A	PAnat. *(d)žng ^w -a	PAnat. *(d)žng ^w -a	N/A	N/A
PHitt.: wŋ > ur / C _ ##; (see Melchert [1994:180])	N/A	N/A	PHitt. *(d)žēhur	N/A	N/A	N/A	N/A	N/A
PHitt.: R > oR; (see Melchert [1994:125– 126])	N/A	N/A	N/A	N/A	PHitt. *(d)žong ^w -a	N/A	PHitt. *(d)žóngon	N/A
PHitt.: ó > ā; (see Melchert [1992:43– 44; 1994: 146] and Discussion 3 below)	PHitt. *(d)žāk ^w -V	N/A	N/A	N/A	PHitt. *(d)žang ^w -a	N/A	PHitt. *(d)žāngan	N/A
PLuv.: wŋ > ūR / C _ #; (see Melchert [1994:261])	N/A	N/A	N/A	PLuv. *(d)žēhūr	N/A	N/A	N/A	N/A
PLuv.: R > aR; (see Melchert [1994:260– 261])	N/A	N/A	N/A	N/A	N/A	PLuv. *(d)žang ^w -a	N/A	PLuv. *(d)žangěn
PLuv.: ó > ā / _ C ₁ V; (see	N/A	PLuv. *(d)žāg ^w -	N/A	N/A	N/A	N/A	N/A	N/A

Melchert [1994:244] and Discussion 3 below)		V						
PLuv.: *h > Ø / Accented Long Vowel _ u; (see Melchert [1994:258])	N/A	N/A	N/A	PLuv. *(d)žēūr	N/A	N/A	N/A	N/A
PLuv.: ē > Ø / _ u; (see Melchert [1994:258])	N/A	N/A	N/A	PLuv. *(d)žūr	N/A	N/A	N/A	N/A
PIitt.: Nasal (variably) > Ø / _ Obstruent ; (see Justeson & Stephens [1981] and Discussion 4 below)	N/A	N/A	N/A	N/A	Does not actually apply	N/A	PHitt. *(d)žāgan	N/A
PHitt.: Stage 2 of the Hitt. version of the Anatolian dissimilation rule; (see also Melchert [1994:112–113] on voicing quality of stops in medial consonant clusters and possible realization of /-Cw-/ as [Cuw])	Hitt. šāg ^w -i/a (= <šākui-, šākuwa->)	N/A	Hitt. šēhur	N/A	Hitt. šang ^w -a (= <šankuwa>)	N/A	Hitt. šāgan	N/A
PLuv.: Stage 2 of the Luv. version of the Anatolian dissimilation	N/A	PLuv. *dāg ^w -V	N/A	PLuv. *dūr	N/A	PLuv. *dang ^w -a	N/A	PLuv. *dangēn

Ø / _ i; (see Melchert [1994:254, 280] and Discussion 7 below)								
PLuv.: g ^w > w; (see Melchert [1994:239, 254])	N/A	PLuv. *dāw-V	N/A	N/A	N/A	N/A	N/A	N/A
PLuv.: Devoicing of initial stops (see Melchert [1994:252])	N/A	Luv. tāw-V (i.e., tāwa/ī)	N/A	Luv. tūr (= <dūr>)	N/A	Luv. tammūga	N/A	Luv. tāin (stress retraction?)

Table. Etymological development of 4 proposed pairs of Hittite and Luvian items exemplifying posited application of the *Anatolian dissimilation rule*

Discussion 1. We believe Rasmussen (1994, 1999 [1983]) makes a reasonable case for PIE *h₂ and *h₃ having been phonetically [x] and [ɣ^w], respectively. We, of course, require *h₃ to have been rounded in order for the *Anatolian dissimilation rule* to make phonetic sense; if necessary, the rule could be modified slightly if it should turn out that phonetically *h₃ was not precisely [ɣ^w].

Discussion 2. We concede that we do not know the specific phonetic motivation for this change, though it could be viewed as a kind of consonant-cluster simplification.

Discussion 3. Melchert (loc. cit.) gives evidence requiring this change to be a separate one in various Anatolian languages, including Hittite and Luvian.

Discussion 4. One may speculate that the presence of another nasal in the environment (e.g., as in PHitt. *(d)žāngan) increases the rule's likelihood of application.

Discussion 5. There is ample precedent for this rule. Thus, we find...

- English *sandwich*, which is typically pronounced with the /d/ elided (i.e., with medial /nw/), side by side with jocular/dialectal *samwich* (with medial /mw/) as well as jocular/dialectal *sangwich* (with medial /ŋ(g)w/—thereby indicating that the /w/ is truly labiovelar, since it can induce an assimilated labial or velar nasal).
- Toch. A *auk* < Pre-Toch. *amk^w < *h₂eng^{wh} 'snake' (reconstructions by Georges-Jean Pinault, p.c.), unless the Pre-Tocharian form is a reflex of PIE *h₂emg^{wh} - with original -m-.

Discussion 6. Although Melchert (1994:254) writes that, in Luvian, P. Anat. "... */g^w/ does appear to be weakened to /w/ in all positions ...", he has no examples after nasals (and we know of no others); we are therefore free to adduce—just as Hart (2004:345) does—Lat. *ninguit* 'it snows' as contrasted with *nix*, *nivis* 'snow' to support a different treatment of *g^w in this position.

Discussion 7. It is interesting that Melchert has taken at least three different positions concerning the etymology of Luv. *tāin* / *tāin*:

- In Melchert (1993:201 s.v. *dāin* 'oil') he refers to Starke (1990:240) and writes: "See there for likely etymology". Starke's rather tentative etymology actually appears on p. 241, where he writes: "Die Bedeutung von *tā(i)in*- verlockt zu

- einem Anschluß an gr. N.A. *στέαρ*, G. *στέατος* (mit Quantitätsmetathese < **στᾱ'ἰαρ*/**στᾱ'ἰα-τ-ος*) '(stehendes) Fett, Talg'..., das außergriechisch bislang ohne direkte Entsprechung geblieben ist. Dabei könnte k.-luw. *tā(i)in*-... dessen Rückführung auf uridg. **stéh₂i-r*/**stéh₂i-n*- (zu **stéh₂i*- 'verdichten') stützen; ...". (We note that this etymology precludes a relationship with Hitt. *šāgan*.)
- In Melchert (1994:246) he is wavier, writing: "The nt. noun *tāin*/*tāin* surely reflects some sort of contraction, but the source and structure of the word are unclear. See Starke (1990: 239ff.)." We would argue, of course, that this "contraction" is actually the loss of the medial consonants, as given in our etymology in the Table. Incidentally, Starke (op. cit.: 239) notes that the form of this word, with its ending in *in*, is unique in Luvian (he even gives it its own subsection). The sequence of internal long vowels also appears to be unique in Luvian; we suspect that it caused a retraction of the accent to the first syllable, in turn triggering an optional shortening of the second vowel.
 - In his June 9, 2005 email to us, Melchert rejects our etymology for *tāin* / *tāin*. He writes: "I stand by my claim that the cognate of *sagan*=*tāin* is Latin *sagīna*." Obviously, this etymology has the virtue of treating the Hitt. and Luv. forms as being related. Nevertheless, we find it unconvincing. For one thing, the semantics are unconvincing: Lat. *sagīna* means 'a stuffing, cramming, fattening, feeding'. But most importantly, it gives yet another pair with an initial correspondence of Hitt. *s* to Luv. *t/d* that Melchert must ascribe to an irregular development of PANat. initial **s*; (he writes [1994: 274–275]: "In two words PA initial */*s*/ appears irregularly as a Luvian dental stop: **sōg*"/*ih*- > 'eye, face' *tāwa/i*-=*ta-wa/i*, pl. *tāwa*=*ta-wa/i* (= Hitt. pl. *šākuwa*) ...; **sēhwr*/**sēhun*- 'urine' > *dūr*/*dūn*- (= Hitt. *šēhur*/*šēhun*-)... The semantic and morphological match between Hittite and Luvian in **both** words makes unlikely any attempt to derive the forms from different PIE sources..."). Now, in general, an appeal to a phonologically irregular development borders on the desperate. In the present situation we believe it to be unthinkable, since all three Hittite–Luvian pairs (i.e., even leaving aside the possible 'nail'-word pairing) may reasonably be derived from PIE forms that begin with the (relatively uncommon) **h₃* and have a labiovelar further on in the root, and these three (or four) pairs are the **only** items showing the correspondence. And all this needs to be added to the fact that the four Hitt. items in the Table all begin with an /*s*/ that does not show up in the corresponding extra-Anatolian items, and must thus be attributed, perforce, to an Anatolian-only *s*-mobile. Surely, our explanation is far less idiosyncratic and far more believable.

- Regular results of the *Anatolian dissimilation rule* in other languages
 - No relevant data for Palaic
 - Lycian: /t/ (*tawa* ‘eye [coll. pl.]’, *ñtewē* ‘toward, facing’); (Melchert [1994:318]: “Lycian shares with Luvian the sporadic change of initial */s-/ to /t-/...)
 - Milyan: /t/ (*tewe-* ‘to face’—form and gloss from Shevoroshkin [2004:525])
 - Lydian: /s/ (*saw-* ‘see’—form and gloss from Melchert [1994:336])
- One more possibility: Hittite *šam(a)luwa-* ‘apple’—a reflex of the PIE ‘apple’-word?
 - Topic is very controversial and nothing of ours hinges on it.
 - One PIE root or two? I.e., are the sources of, e.g., Lat. *mālum* (**meh₂lom*) and Eng. *apple* (**h₂ebVl-* vel sim.) related; see, i.a., Mallory & Adams [1997:25–26]).
 - Steinbauer (2004) explicitly derives both the items with *m* and those with *b* from the same underlying root: “nordwestindogerman. **ablu-* < **amblu-* < **a₃mlu-*”, he gives “‘Apfel’ **h₃ómbu-*, **h₃mléu-*, d. i. ‘saure (Frucht)’ h. *šam(a)luwa-* ‘Apfel’”. **h₃mléu-* satisfies the structural description of the *Anatolian dissimilation rule* and is thus a phonological possibility as the source of the Hittite word.

4. Conjectures on the Phonetics and Phonology of Anatolian Palatalization

- Hart (2004:350):

If the normal outcome of initial **h₃* in Hittite was <h> initially, while in other positions it was lost, special conditions must be sought to explain the anomalous development which resulted in Hittite <š>, Luwian <d>.

It so happens that in all environments where **h₃* gives this bizarre result the environment contains a nearby /u/ or /w/. Possibly the presence of such sounds exercised a dissimilatory effect on a neighbouring **h₃*, if this had been phonetically something like [ɣ^w]. It is impossible to be certain what happened here, but in order to arrive at the eventual result, something like a change of [ɣ^w] to [ɣ^l] might be postulated. An intermediate stage of development might be an affricate [dʒ] which was subsequently simplified in Hittite to [ž] but in Luwian to [d], which would sooner or later have become [t] by the devoicing of initial voiced stops....

- In a similar vein, Olsen (2006:??–??) :

Since, for a number of independent reasons, **h₃* can reasonably be assumed to have been a voiced labiovelar spirant [ɣ^w] in IE, the change of **h₃* to š in labial environments looks most of all like a case of dissimilation: If **h₃* lost its rounding, the first step would give a velar spirant [ɣ], i.e. a notoriously most unstable consonant. One

frequent fate of a [ɣ] is to be palatalized and develop in the direction of a [j] (cf. for a parallel close at hand, the Low German pronunciation of older /g/, and further change of a fricative (rather than purely semivowel) [j] equally frequently makes it end up as some sort of dental or palatal affricate or spirant, cf. the stages [dʒ] or [ʒ] in the development of Latin /j-/ in, e.g., *iuven-* > Italian *giovane*, French *jeune* ...

- We propose yet another scenario for the relevant Hittite and Luvian developments:
 - Stage 0 (PIE) has initial /s/, /d/, and /h₃/ (i.e., [ɣ^w]).
 - Stage 1 (Proto-Anat.): [ɣ^w] (if a labiovelar follows somewhere in the item) is dissimilated to [(d)ʒ].
 - Stage 2: In Luvian, [(d)ʒ] > [d] (merging, at least graphically, with [d] from PIE *d). In Hittite, /d/ > [(d)ʒ] / _ i/y (merging with [(d)ʒ] from PIE *[ɣ^w]) > [s] (merging with [s] from PIE *s).

5. A Closer Look at *h₃° in Luvian

- What do researchers assume to be the reflex(es) of *h₃° in Luvian (when there is no labiovelar consonant later in the root)?
- Is there convincing evidence supporting the researchers' positions?

It turns out that many contemporary researchers typically do not state their position.

- Melchert (1994:72), however, explicitly: "... *h₃/ is preserved initially as *h-* in Hittite, Palaic and Cuneiform Luvian."
- But little if any Hittite material is truly probative, and surprisingly little Luvian material is even relevant. Moreover, some of the argumentation we see in the literature concerning Luvian is based on Lycian material (but see Melchert [2003b:175f.]).
- Kimball (1987: esp. 189) states that *h₃° is lost in Lycian and draws inferences from Lycian about Luvian. Her argument for Lycian itself is based on the putative cognate set Hitt. *hāppar* (and related forms) 'business transaction, price' : Lyc. *epirije-* 'sell'. But Rasmussen (1999b:522–524 [1992]) effectively eliminates such a connection.
- Oettinger (2004:397) advocates the loss of *h₃° in Lydian (in addition to Lycian), but gives no citation or material to support this view—and we know of no directly relevant Lydian material.

To the best of our knowledge, this exhausts the traditional material that is relevant for deciding the reflexes of PIE *h₃° in Luvian, Lycian, and Lydian.

6. PIE *h₃w°

- 6.1. Another significant phonological sequence to consider: PIE *h₃w°. The

infrequency of this sequence compared to the rather frequent $*h_2w^\circ$ is very conspicuous. A count of entries in LIV² reveals

- 3 entries with $*h_1w^\circ$ out of 42 total entries with $*h_1^\circ$
 - 18 entries with $*h_2w^\circ$ out of 83 total entries with $*h_2^\circ$
 - 2 entries with $*h_3w^\circ$ out of 21 total entries with $*h_3^\circ$
- These frequencies are not statistically significant: For the frequency of $*h_3w^\circ$ vs. $*h_2w^\circ$, the probability p of its occurring by chance is $\leq .2$. Strong phonetic and phonological explanations of the rarity of $*h_3w^\circ$ are available.
 - Phonetically, both producing and perceiving a tautosyllabic labiovelar consonant + w are inherently difficult, which makes the sequence unstable and thus subject to elimination.
 - No PIE roots begin with a labiovelar stop + w ; that would entail a three-way distinction between that sequence, velar stop + w , and a unitary labiovelar stop. If possible at all, this would be extraordinarily unstable.
 - The situation with initial $*h_3w^\circ$ is similar (though there was no autonomous $/y/$): If $*h_3$ was $[y^w]$, the sequence $/h_3w/$ (phonetically, $[y^ww]$) might well have been simplified to $[yw]$.
 - ⊕ We propose: the contrast between $[y^w]$ and $[yw]$ would have been unstable—especially given the IE phonological system, where $[y]$ would not have appeared elsewhere and no continuants contrast solely on the basis of voicing. The obvious result: $[y]$ devoiced and merged with $[x]$ (i.e., $/h_2/$). That is: $*h_3 > *h_2 / ____ w$. This rule would have operated at least as early as the stage of Common Anatolian.
 - Cohen (2004) gives more than thirty sets of proposed cognates in IE that exhibit relationships between specific initial velar stops and specific laryngeals. One of these relationships involves $*/k/$ and $*/h_2/$. A connection between them has been posited by many researchers going back to the 1950's at least, with, e.g., Martinet (1955:56) connecting Lat. *costa* 'rib' with Gk. *ὀστέον* 'bone'. The more than twenty examples in Cohen (op. cit.) give overwhelming support to the general relationship of initial $*/k/$ and $*/h_2/$ and thus that the *costa*–*ὀστέον* relationship is additional proof that $*h_2$ underlies the h of Hitt. *hastāi* 'bone(s)', Luv. *hās(sa)* 'bone'.
 - Most important for our present purposes: Cohen (op. cit.:58–59) discusses seven examples connecting $*/g^w/$ and $*/h_3/$.
 - One of these proposes a relationship between Skt. *Garuḍa* 'god that is half-man, half-eagle; "the king of eagles"' ($< *g^wōr-$) and Hitt. *hāras* 'eagle' ($< *h_3or-$),¹ with which we of course include Pal. *hāras* 'id.'. If this relationship is accepted, it constitutes decisive evidence of $*h_3^\circ$ (when there is no labiovelar consonant later in the root) $>$ Hitt., Pal. h .
 - Moreover, we propose to connect Cün. Luv. *aruti-* (cf. Melchert [1988:224f.]) to *Garuḍa*. Melchert argues convincingly that *aruti-* has the original meaning

¹ For the sake of accuracy and completeness, one should reconstruct **h₃er-* > **h₃or-* and **g^wer-* > **g^wor-*.

of 'wing'. He notes further that the attestations of the Cuneiform Luvian word are closely associated with eagles. However, he gives the following etymology, which to us is less than compelling: "A possible analysis of a Luvian stem *aruti-* 'wing' is that of an action noun in **-u-ti-* (cf. Hitt. *-u-zzi-*) to the root **ar-* 'fit' (Grk. ἀρπάζω 'fit together, join', Hitt. *āra* 'what is fitting', etc.). For **ar-u-ti-* 'fitting, joint' as 'wing' compare Lat. *āla* 'wing' < **aks-lā-* with Germ. *Achsel* 'shoulder-(joint)'. We posit instead that Luv. *arut(i)-* 'wing' corresponds to Skt. *garut-* 'id.', which is transparently from the same root as *Garuda*. It is clear, as also noted in the Table above, that PIE initial **g^w* > PLuv. **w* > Luv. *w*, and so the Luvian form would have to go back to the version of the root with **h₃^o*.

what happened to the w-?

Thus our posited etymology indicates that **h₃^o* (when there is no labiovelar consonant later in the root) > Luv. *Ø*.

- Also in Cohen (loc. cit.) is a proposed relationship between OHG *questa* 'bundle of leaves, broom, etc.' (< **g^we/os-do-* 'branches, foliage') ~ Gk. ὄζος 'bough, branch, twig' (< **h₃e/os-do-* 'bough, branch'), The Hittite reflex is *hasduēr*, glossed typically as 'brushwood, twigs, branches' and the like. The word is a collective, as indicated by its distribution. It is the only one among all the cognates that exhibits the suffix *-yer-*.
- Most significantly, there are two major unresolved questions concerning its root:
 - Is the root's initial laryngeal **h₂* or **h₃*?
 - What, if any, is the root's internal structure?
- The key point about *hasduēr*: If, as we surmise, its etymon has **h₃^o*, one might expect, since there is a [w] later in the word, the Hittite word to begin with *š*.
 - However, the domain of the *Anatolian dissimilation rule* may be the stem—and this [w] is obviously part of the suffix.
 - Alternatively, it is possible that the word was formed in Hittite after the *Anatolian dissimilation rule* had ceased operating; this would allow the domain of the rule to be the word, rather than the stem.
- Another example of initial **g^w/ ~ *h₃/* in Cohen (2004) is the hitherto etymologyless Eng. *quirk* (< proposed zero-grade **g^wrg-*) ~ Hitt. *hurki-* 'wheel' (< zero-grade of of an IE root given in LIV²:290–291 as **h₂uerg-* 'sich umdrehen, sich wenden'). We offer here what we believe to be a much improved solution: namely that we are seeing the residue of the sound change we proposed above, **h₃ > *h₂ / ## _ w*.
- Obviously, if the premise of a relationship between velars and laryngeals—and in particular for our present interests, **g^w* and **h₃* (i.e., [Y^w])—is accepted, that relationship must go back to PIE, since items in all the daughter languages can exhibit either **g^w^o* or **h₃^o*.

There is, moreover, another important consequence of our reanalysis. Since

- the application of $*h_3 > *h_2 / \#_ w$ must have occurred no later than Common Anatolian,
- its application causes $*h_3uerg-$ to become pre-Greek $*awerg-$, and
- we assume by Ockham's razor that there was a single rule embracing both,

the rule must date back to no later than when Common Anatolian and pre-Greek were unified, i.e. PIE. We will therefore refer to this rule hereinafter as the *PIE dissimilation rule*.

- Two further examples of pairs of PIE roots that can be brought together through the $*g^{wo}/*h_3^o$ relationship. (These items are offered in support of the *PIE dissimilation rule*, but, since there are no known relevant reflexes in Greek or Anatolian of the etymon we posit with $*h_3^o$ [which the rule will change to $*h_2^o$], there is no proof that they reflect a PIE initial laryngeal. We offer them as supplementary evidence.

- $*g^{w}elH-$ 'träufeln, quellen' (root and gloss from LIV²:207), $\sim *h_3welH-$ '(to) well, spring' (a root we hereby propose, to cover the relevant reflexes that have been traditionally ascribed [rather unconvincingly, we would say] to $*wel-$ 'to turn, to roll, etc.). Most noteworthy: the exact correspondence of Germ. *Quelle* 'spring, source, well' : Eng. *well*.
- $*g^{w}eh_2d^h-$ 'eintauchen' (root and gloss from LIV²:206) $\sim *h_3weh_2d^h-$ 'to wade, to make one's way through' (a root we hereby propose as a replacement for $*weh_2d^h-$ 'durchschreiten' [root and gloss from LIV²:664]). Most noteworthy: the exact correspondence of OInd. *gādhdā* 'ford' : Lat. *vadum*, OIc. *vað*, OHG *wat* 'ford'.

- There is one last ostensible inconsistency to eliminate. We have established the presumably exceptionless *PIE dissimilation rule*, but there are two roots in LIV² with $*h_3w^o$. And there are two nouns widespread within the daughter-languages whose etyma begin with a laryngeal that have w as the next consonant, but for which the identity of the initial laryngeal of each is in dispute: the IE words for 'sheep' and for 'bird'.

- " $*h_3uath_2-$ 'verwunden'": The root shape given by LIV² is apparently an attempt to cover both "... gr. hóm. *oûta* 'verwundete' ...", which is derived there from (zero-grade) $*h_3ut-$, and "... lit. *voûs* 'bösesartiges Geschwur' ...", which is derived there from (full-grade) $*h_3uāth_2-i-$.

- We propose an alternative root shape, which, in addition to obviating $*h_3w^o$, has three significant side benefits: It eliminates the need for positing an ablauting a in the root, offers an explanation for the $*ā$ in the source of the Lith. form (required for the attested o), and allows us a straightforward derivation of several Gk. forms that are clearly related to *oûta* but that have a -vocalism. Our solution is based on processes and relationships elucidated by Rasmussen (1999a [1992]).
- The underlying root shape we posit is $*h_3euh_2-$. For both Hom. Gk. *oûta* and Lith. *voûs*, we assume a suffixal $-t-$ (in conformity with IEW:1108 where both words are given "mit t -Formans"). For *oûta*,

we, like LIV², begin with zero-grade. Our derivation, which is directly analogous to that of Lat. *cutis* ‘skin’, Welsh *cwd* ‘scrotum’, etc. (< the zero-grade of **(s)keuh₂-* + *-t*) as given by Rasmussen (op. cit.:496–497) is **h₃uh₂-t* > **h₃uth₂-* > **h₃ut^h-* > **h₃ut-* > *oûr-*. For *votīs*, we begin with a full-grade **h₃ēuh₂-t-*, but in its Schwebeablaut form, **h₃ueh₂-t-*. This, by the *PIE dissimilation rule*, would become **h₂ueh₂-t-*. This, in turn, straightforwardly (via **wā-t-*) yields Lith *vo-t-*. Now, IEW (loc. cit.) lists a series of Gk. forms without root-extensions that we agree are undoubtedly related to *oûta*. Thus, we see there: “Gr. ἀάω ‘schaden, verletzen’ ...; außer ἀάται nur Aoristformen ἀασα, -άμην ...; primäres Verb, Aor. *ἀFά’-σαι, themat. Präs. *ἀFά-εσαι > ἀάται...”. For these items, we also begin with a full-grade **h₃ēuh₂-*, again in its Schwebeablaut form, **h₃ueh₂-*. This, again by the *PIE dissimilation rule*, would become **h₂ueh₂-*. This, in turn, yields Gk. ἀ(F)ά-...

- “**h₃ueig-* ‘öffnen (?)’”: This item is dubious in several ways. First of all, we cannot be sure that it is in fact PIE. It has reflexes only in Greek. Traditionally, it has been handled as a construction of the form prefix + root. The etymology in LIV²:308 is footnoted there as being based on the exposition in an oral presentation, viz. Forssman (2000). The written version—i.e., Forssman (2005)—is now available.
 - Forssmann gives Ved. *vej/vij* ‘zucken’ and Gmc. **ueik* ‘weichen’ as possible cognates there. These, of course, are hardly compelling semantically (and furthermore do not supply any evidence in favor of an initial laryngeal).
 - Indeed, LIV² (loc. cit.) does not even mention the Germanic item and states that the equation with the Vedic item is problematic.
 - Moreover, Forssmann himself (loc. cit.), expresses doubt about the structure of the item and its provenance.
 - Also, there are no attested forms in any of the dialects showing *F* following the initial *o* (or *u*).
 - Thus, put succinctly, the item under consideration (which is in any case not at all certain to have come down to us from PIE) does not have a secure root-initial laryngeal in its etymology and therefore is not a convincing counterexample to the *PIE dissimilation rule*.
- ⊕ There is strong disagreement as to the initial laryngeal of the basic IE word for ‘sheep’. Sihler (1995:178), Kortlandt (2001:1), Baldi (2002:244), and Kloekhorst (2004a) give **h₃ewi-*; whereas, e.g., Mallory & Adams (1997:510), Meiser (1998:56), Kimball (1999:142), Watkins (2000:61), and Ofitsch (2000:236) give **h₂owi-* vel *sim*. We find that, much as with the IE word for ‘bone’, crucial evidence comes jointly from Greek and Anatolian: Gk. ὄ(F)ις guarantees **h₁o°*, **h₂o°*, or **h₃o°*; the *h* of Luv. *hāwali-* and the *x* of Lyc. *xawa-* eliminate **h₁o°* as a possibility; and though *hāwa/i-* and *xawa-* might appear to allow either **h₂o°* or **h₃o°*, an initial **h₃* in this item—as we

have shown—would have become Luv. *t/d*, Lyc. *t* via the *Anatolian dissimilation rule*. Therefore, the PIE word for ‘sheep’ must have had $*h_2^\circ$. Details of the vocalism, particularly as evidenced in Tocharian and Indo-Iranian, need some elucidation, however. Kim (2000b:38–39) argues persuasively that the Toch.B *awi* ‘ewes’ must derive from a form with $*h_2e^\circ$.

- The basic IE word for ‘bird’ is, at first glance, problematic, because while Hitt. *šunwaiš* guarantees $*h_3^\circ$ (via the *Anatolian dissimilation rule*), Gk. *αἰετός* ‘eagle’ requires $*h_2^\circ$. We believe the source of this disparity is the *PIE dissimilation rule*. That is, we believe that the word was proterokinetic and its fundamental form was $*h_3ew-i-$; it would thus have had an original paradigm including, e.g., nom. $*h_3ew-i-s$, gen. $*h_3w-ey-s$. The latter would have become $*h_2w-ey-s$ by the *PIE dissimilation rule*, thereby creating an intolerably complicated paradigm. The paradigm would then have been regularized, generating two competing variants of the item with $*h_2^\circ$ and $*h_3^\circ$. As it has done in the cases of *οὔρον* ~ *ἄερον*, *ἄεσαν* and *ἄἰω* ~ *οὔτα*, Greek has taken advantage of both variants, with $*h_2^\circ$ in *αἰετός* and $*h_3^\circ$ in *οἰωνός* ‘bird of prey’. We posit that the initial vocalism of Lat. *avis* is derived similarly: Forms generated by the *PIE dissimilation rule* (e.g., gen. $*h_2weys$) would serve as the source of a new nom. $*h_2ewis$, whence *avis*.

- Our analysis has two further benefits. For one thing, it eliminates any need to posit a root with original ablauting $*a$ (immediately following $*h_3$) for the ‘bird’-word, as is done, e.g., by Rasmussen (1999 [1990/91]:448) and Olsen (2006:237). Moreover, it offers a straightforward solution to problems associated with the etymology of the basic IE word for ‘egg’—whose reflexes we see in, e.g., Gmc. $*ajja-$ (> ON *egg*) and Gk. *ᾠόν*, *ᾠόν*—and its possible relationship to the ‘bird’-word. There is a long history of scholars attempting to relate the semantically and phonologically similar ‘egg’- and ‘bird’-words, but bringing the phonology, morphology, and semantics into conformity has always led to difficulty. Thus we see, for example, in Mallory & Adams (1997:176) at the entry for EGG the noncommittal but suggestive: “ $*h_a\bar{o}(u)iom$ ‘egg’ ... Wels *wy* ‘egg’, Lat *ōvum* ‘egg’ (curiously close in form to Lat *avis* ‘bird’), ... Gk. *ᾠόν* ‘egg’.... It is quite possible that the word for ‘egg’ is a vrddhied derivative of the word for ‘bird’ ($*h_a\bar{e}uei-$).” And we find in Peters (1980:292–305) a minutely detailed *Exkurs* that uses data from Greek dialects to try to supply a set of phonological rules that can salvage the argument in Schmeja (1963) that Gk. *οἰωνός* is an exocentric derivative of *ᾠόν*. As Peters notes (p. 292), Schindler (1969:158) finds Schmeja’s solution the best one morphologically. However, Peters does not mention that Schindler sees semantic problems as well (as do we); Schindler (loc. cit.) writes specifically: “Morphologisch ist ... die Lösung von H. Schmeja ... die beste, lautlich und semantisch überzeugt sie dagegen weit weniger.” Even if one accepts Peters’ heroic phonological efforts—and at most they seem to us merely to establish phonological possibilities—they do nothing to obviate the fact that deriving ‘bird’ from ‘egg’ is intuitively

far less than plausible than deriving 'egg' from 'bird'. Using the *PIE dissimilation rule* makes a harmonious solution possible.

7. Conclusions

In summary, we have demonstrated that

- there are indeed unassailable examples of $*h_3^\circ > \text{Hitt. and Pal. } h$;
- there is regularity in this development of $*h_3^\circ > h$;
- there is regularity in the outcome $*h_3^\circ > \emptyset$ (in particular phonological environments in Hittite and, except as specified in the next item, generally in Luvian; and
- $*h_3^\circ$ regularly develops into Hitt. \check{s} , Luv. t/d , Lyc. and Milyan t , Lyd. \check{s} before a succeeding labiovelar anywhere in the stem (or, perhaps, in the word)—in accordance with our reformulation, the *Anatolian dissimilation rule*.

Moreover, we have originated and instantiated a phonological rule, the *PIE dissimilation rule*, which dates back to PIE at the latest and has wide applicability.

It is important to note, furthermore, that in the process of substantiating these facts and rules we have come up with subsidiary generalizations and simplified explanations concerning hitherto disparate phenomena, thereby supplying a system in which *tout se tient*. Specifically, we have established the following mutually supportive findings:

- Hitt. $\check{s} < \text{PIE } *h_3$ always corresponds to Luv. t/d (i.e., never to Luv. \check{s}).
- Hitt. $\check{s} < \text{PIE } *s$ in turn regularly corresponds to Luv. \check{s} (i.e., never to Luv. t/d).
- There are no cases that do not have an $*h_3$ along with a labiovelar appearing later in the word where Hitt. \check{s} does correspond to Luv. t/d .
- Without the *Anatolian dissimilation rule*, Hitt. $\check{s} \sim \text{Luv. } t/d$ can only be "explained" by a desperate appeal to a sporadic sound change.
- There are no other candidates in Anatolian for the reflexes of each of the relevant IE roots (even including the insecure word for 'apple').
- The Hitt. and Luv. item pairings in the Table above have essentially identical meanings and nearly identical structure (taking into account the r/n -alternation in $\check{s}\acute{e}h\check{u}r \sim d\acute{u}r-/d\acute{u}n-$), but without the *Anatolian dissimilation rule* it is far from straightforward to trace them back to single sources.
- Etymologizing these Anatolian items from other IE roots presupposes either nominal derivatives not known from other branches (e.g., taking Hitt. $\check{s}akuwa-$ from a presumed nominal o-grade $*sok^w o-$) or affinity with relatively isolated forms (e.g., Lat. $sag\acute{i}na$).
- Except for cases where the *PIE dissimilation rule* would first have applied, there seem to be no examples where a PIE root having the structure $*h_3 \dots$ labiovelar yields anything but Hitt. \check{s} or Luv. t/d .
- $\check{s} \sim t/d$ are reasonable representations in cuneiform writing of the phonetic reflexes (or graphic representations thereof) of the P.Anat. $*[(d)\check{z}]$ (produced by the *Anatolian dissimilation rule*, i.a.).

- The *Anatolian dissimilation rule* itself is supportive of the phonetic value [Y^w] for *h₃, posited on independent grounds by other scholars, which in turn correlates well with potential PIE variant forms having a corresponding *g^w.
- The *PIE dissimilation rule* accounts for the otherwise inexplicably missing PIE roots in *h₃w^o.
- The *PIE dissimilation rule* allows straightforward explanations for apparent vocalic anomalies in the etymologies of the reflexes, particularly in Greek, of the PIE words for 'bird' and 'egg', and for the relationship of, e.g., Hom. Gk. οἰττα and Lith. votis—all without any need to resort (as other scholars have had to do) to an underlying form with ablauting *a.

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