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SOME OBSERVATIONS ON THE PUTATIVE DUAL REFLEXES OF PIE **CRHC* IN GREEK AND ARMENIAN, FRANCIS' LAW AND GREEK *αὐχήν* 'NECK, ETC.'

Abstract. The notion of accentually determined dual Greek reflexes of PIE *CRHC* sequences, now well supported by Rix 1976, Rico (several publications) and even (spasmodically) by Beekes 2010, is matched in a new way with a version of Clackson's 1994 dual Armenian reflexes of the same PIE sequences that has been made more secure by a suggestion of Olsen's 1999. An unpublished rule for Greek by Francis 1970 is shown to be essentially a special case of the foregoing and alleged counterexamples are found to be similarly accentually determined. The slightly improved notion of the closeness of Armenian and Greek thus achieved becomes the basis for a new explanation of the origin of Greek *αὐχήν.*

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1. Clackson (1994: 36–41) presents a useful review of the "five different outcomes in Armenian" (l.c., p. 40) that have been proposed for the PIE sequence *CRHC* and reduces them, for the most part unobjectionably, to two, viz. *CaRC* and *CaRaC*. Clackson's solution is improved in one respect by Olsen (1999: 93 n. 191) who observes that the relationship between the pairs *canawt'* 'known' : *čanač'em* 'I know', *aławt'k'* 'prayer' : *ałač'em* 'I beseech', *amawt'* 'shame' : *amač'em* 'I am ashamed' suggests that "-*araw*- is simplified to -*ara*- whether in unstressed position or before a consonant cluster". The cluster in question in the verbs results no doubt from the suffix *-*sk*- generally reconstructed in their protoforms (Clackson l.c. 40; Olsen l.c. 169). Looking through Clackson's examples the only exception to this rule seems to be *t'ałar* '(earthenware) vase' < **tlh*$_2$-, which is attested only in the modern language and concerning which Clackson (l.c. 39) cites Hübschmann's opinion that the word may be a Persian loan.

It seems to me that Olsen's rule can also be applied to the pair *arawt* 'pasture' : *aracem* 'I pasture'. For *arawt* Olsen (1999: 92f.) proposes a root noun **srh*$_2$*u*- under the rubric "Stems in *-*d*-" claiming "*-*d*- somehow seems to emerge from the laryngeal in connection with /u̯/ although the exact details escape our control."

Further Olsen opines (l.c., n. 191) that the *-w-* in this noun is "apparently part of the original root, not just a secondary feature pertaining to the development of 'long sonants'." But since the **u* Olsen added to the root found in Pokorny (1959: 910) appears not to be a fixture and also since Olsen (l.c. 92 f.) acknowledges that *aracem* "would appear to be a simple denominative in **d-i̯-*" and that *arawt* is an "*i*-stem in Yovhannēs Drasxanakertec'i" it seems that her mysterious claims of an inexplicably emerging **d* and a *w* that is "apparently" part of the root can be replaced by the hypothesis that the original noun to which *aracem* is the denominative has been lost and replaced by a new root noun based on the apparently new root **srh₂di-* – of the denominative and this has been subsequently reanalysed as an *i*-stem. Alternatively, an *i*-stem has been formed from the new root **srh₂d-* that has been abstracted from the verb. The *w* that then appears in what becomes the final stressed syllable of the Armenian noun disappears quite naturally in the nonfinal syllable of the verb stem **srh₂di-e/o-*.

On this basis the examples collected by Clackson for most of his five outcomes can be (re-)classified as follows.[1]

Under *CaRC*:

dr-and 'door-post' : Ved. *ắtā-* 'frame of door', Lat. *antae* 'square pilasters'.
armukn 'elbow' : Ved. *īrmá-* 'arm'.
kałin (< * *kałn*? – ibid. 135 f.) 'acorn' : Gk. *βάλανος*.
cicałim 'I laugh' < **ĝel-ĝlh₂-*, cf. Gk. *γελάω* 'id.'.
garn̄ 'lamb' < **urh₁n-*, cf. Gk. *πολύ-ρρηνες* 'many-lambed'.
karkut 'hail' < **grH-groHd-*, cf. Lat. *grando* id.'.
barti 'Populus nigra' < **bʰrh₁g-*, Lith. *béržas*, PSl. **bèrza* 'birch'.
t'ał 'district (of a city)' < **tlh₂-ni-*, cf. Lat. *tellus* 'ground, earth'.

Under *CaRaC*:

k'arasun '40' < **(kʷ)turī̆-ḱomt*: West Greek *τετρώκοντα*.[2]
ewt'anasun '70' < **septm̄-ḱomt*.

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[1] In addition to *t'ałar*, the following of Clackson's items have been excluded from these lists mostly on the basis of Clackson's remarks: *xałał* 'peacefully' which, like other instances where apparently Arm. *x* = Gk. χ, is perhaps based on an early borrowing from Greek, cf. *χαλάω* 'slacken, lower, let down, relax, loosen, open, be open' after the asperae had devoiced there, *k'ałak* 'city' is perhaps an Iranian loan; *erastank'* 'arse' is < **preh₂ḱt-* beside **proh₂ḱt-* > Gk. *πρωκτός* 'id.' (Beekes 2010 s.v.) rather than remodelled from **arast* < **prh₃ḱt-* by Iranian loan *erank'* 'thighs, loins' as per Olsen (1999: 320); *(a)nawt* 'fasting' with anlaut **n̥h₁* is not quite *CRHC*, apart from the uncertain Armenian anlaut; *cnawt* 'jaw' and *cnawł* 'parent' probably both reflect **ĝenh₁C-*.

[2] If this form belongs here at all – see doubts by Waanders (1992: 375 f.); it will continue to be quoted, particularly in respect of its status as a possible exception to the rules to be proposed below, with this proviso being taken as read.

čanač'em 'I know' < *$\hat{g}nh_3$-sk-i-e/o-, cf. Gk. *γιγνώσκω*.
ałač'em 'I beseech' < *plh_3-/*slh_2- + *-sk-i-e/o-, cf. Gk. *ἵλάσκομαι* 'appease' < *$sislh_2$-* (on short *ά* see ibid. 173 f.).
amač'em 'I am ashamed' < *smh_3-sk-i-e/o-.
aracem 'I pasture' < *srh_2-d-i-e/o-* (rather than *$trh_3\hat{g}$-e/o-).
aławni 'dove' < *plh_2-b^h-ni-.
arāǰ 'first' < *prh_2uio- (not *-h_3-, see on Gk. *πρῶτος*/*πρᾶτος* below), like *ołǰ* 'sound, whole' < *soluio- – thus Olsen (1999: 197) who suggests that *r̄* in *arāǰ* may be due to the influence of the preposition *ar̄*, the phrase *ar̄ aǰ* being understood as meaning '(what is) to the right, right at hand'.
ałand 'heresy' < *h_2lh_2-, cf. Gk. *ἀλάομαι*.
haraw 'south' < *prH-uo-, cf. Ved. *pū́rva-*; Olsen 1999: 26 who has *H* = h_3, but this is uncertain if based on Gk. *πρῶτος*/*πρᾶτος*, on which see below.

And with *CaRawC* in the Armenian final, i.e. stressed, syllable, as indicated above:

canawt' 'known' < *$\hat{g}nh_3$-ti-, cf. *čanač'em* 'I know' above.
aławt'k' 'prayer' < *plh_3-ti- or *slh_2-ti-, cf. *ałač'em* 'I beseech' above.
amawt' 'shame' < *$(s)mh_3$-ti-, cf. *amač'em* 'I am ashamed' above.
arawt 'pasture' < *srh_2d-i-, cf. *aracem* 'I pasture' above.

Clackson is less successful, however, in his comparison of these two Armenian outcomes, *CaRC* and *CaRa(w)C*, with the two proposed by some scholars for Greek, viz. $CR\bar{E}_iC$ and CE_iRE_iC – of which more shortly. First it is necessary to discuss the Greek material by itself.

2. The two Greek outcomes of *CRHC* are conveniently illustrated by such pairs and groups as (with *h_1:) *(κασί-)γνητος* 'born (together), i.e. brother' : *γένεσις* 'origin, generation', (with *h_2:) *θνητός* (Dor. *θνᾱτός*) 'mortal' : *θάνατος* 'death; dead body', (Hom.) pf. *κέκμηκα* 'be weary', ptpl. *κεκμηώς* : (Att.) *κάματος* 'toil', (Hom.) gen. sg. *κρᾰ́ατος* : (Hom.) nom. pl. *κάρηνα* (< *k_1rh_2sn-) 'head', (with *h_3:) *στρωτός* 'spread', (Att.) pf. *ἔ-στρω-ται* : (Aeol.) pf. *ἐ-στόρο-ται* (taken from Rix 1976: 72 f.).

To these can be added the additional items accepted by Beekes (2010 s.vv. infra) in the corpus of pairs classified by Rico (2002/2006: 170) into three categories of likelihood, viz.: (Rico's "possible") *θρᾰ́σσω* 'disturb, trouble' : *ταράσσω* 'stir, agitate, confuse, arouse, startle' or rather ταραχή or better still Xenophon's *τάραχος*, both meaning 'trouble, disorder' (but not *πλήσσω* 'strike' : *παλάμη* 'palm of the hand' which Beekes rejects); (Rico's "probable") *γλήνη* 'eyeball' : *γαλήνη* (Dor. *γαλᾱ́νᾱ*) (< *g_1lh_2sn-) 'stillness of the sea, calm weather',[3] *βλᾰ́ξ* 'indolent,

[3] Though it must be said that while Beekes cross-references these words with each other he favours an IE etymology only in the case of *γαλήνη*.

stolid, stupid' : *μαλακός* 'soft'; and (Rico's "certain") *ἄδμητος* 'untamed, unmarried' : *ἀδάματος* 'untamed', *τλητός* (Dor. *τλᾱτός*) 'able to tolerate, patient; bearable; suffered, endured' : *τάλαρος* 'basket'.

Rix (1976: 73) makes the tentative suggestion that the disyllabic reflexes of the segments result from (secondary) accentuation of the *RH* complex.

As far as I have been able to determine, Beekes (2010) expresses agreement with Rix only in the cases of *ταραχή*, *ταλάσσαι* and *δαμάσ(σ)αι* (l.c., s.vv. *θρᾰ́σσω*, *ταράσσω*, *ταλάσσαι*) for which Beekes recognizes that a secondarily accented zero grade seems to be required "as defended by Rix" (l.c., s.v. *ταράσσω*) and "in spite of earlier objections" (l.c., s.v. *θρᾰ́σσω*), i.e. those voiced by Beekes himself (see below). This new view of *δαμάσ(σ)αι* (l.c., s.v. *ταλάσσαι*) is not the one stated earlier in the book (l.c., s.v. *δάμνημι*), where the older explanation of reshaping from **δεμα-* is given. Evidently, Beekes had a change of heart about the *-aRa-* forms while working on his 2010 dictionary and either was not able to completely expunge his old ideas from the work or felt that in some instances they still represented the superior view.

Beekes' earlier belief (see 1969: 207; 1976: 9 et passim) was based on dismissing the idea of a secondary accentuation on the ground that the zero grade necessarily implies lack of accent. This is all the more remarkable because in setting up this belief Beekes (1969: 207) found it judicious to cite a very useful counterexample from Germanic, viz. OHG *mord*, OIcel. *morð* 'death, murder' < **mŕto-* (beside Ved. *mṛtá-* 'dead') in which the output of Verner's law testifies precisely to an accented zero grade. Instead Beekes saw the Greek disyllabic reflexes as representing the cases where the *RH* complex is immediately preceded or followed by **e*. The first case, **eRH*, is still represented by *γένεσις* (2010 s.v. *γίγνομαι*), a decision that seems entirely ad hoc: Greek nouns like θέσις 'a placing etc.' < **dʰĺ̥₁ti-* and *στάσις* 'a standing etc.' < **stĺ̥₂ti-* have (secondarily) accented zero grades and must belong to a late stage of the protolanguage when the laryngeals had become more vocalic (at least in some dialects; on this subject generally see Reynolds/West/Coleman 2000), so there is no reason why γένεσις should not exhibit the same formation, i.e. **ĝnĺ̥₁ti-* or **ĝńh₁ti-*.

The case where Beekes' **e* follows *RH* is illustrated by the most of the remainder of the material (see Beekes 2010 s.vv. *θάνατος*, *κάμνω*, *κάρα*, *κάρηνα*, *γαλήνη*, *βλᾰ́ξ*, *μαλακός*, but not *δάμνημι*) though little is said about *ἐστόροται* (see s.v. *στόρνυμι*).

Rico (2000: 197) espouses the same accent conditions for the variants as Rix and points out in addition the numerous accentual changes that have occurred in the history of Greek, especially in the case of nominalizations of old adjectives and participles (l.c.: 196). Rico's 2000 paper contains a masterly survey of previous research on the topic, noting a number of scholars who have sought solutions in differing accent place, sometimes hesitantly, e.g. Beekes with his

"impression … that adjectives are oxytone and nouns barytone" (Beekes 1988: 74; Rico 2000: 182), and including some who have been led astray as a result, like Specht who in KZ 59 (1932) invoked the *τόμος* : *τομός* noun/adjective opposition and concluded therefore that the disyllabic reflexes represented the *o*-grade (Rico 2000: 174 f.).

The *τόμος* : *τομός* opposition is an obvious exemplar of the principle that adjectives are oxytone and nouns barytone, but those who may still be inclined to scoff at the application of the principle in the present case should remember that it it is found in other formations beside *o*-grade *o*-stems, such as *s*-stems – and not only in Vedic, e.g. *táras-* 'velocity, energy' vs. *tarás-* 'quick, energetic' and *rákṣas-* 'act of guarding; something to be guarded against' vs. *rakṣás-* 'harmful' (and 'evil being, demon', which reveals the potential for secondary substantivization), but seemingly also in Germanic, e.g., coupled once again with Verner's law, the gender variation in Goth. *agisa* n., OE *eg(e)sa* and OS, OHG *agiso*, *egiso* m. and OHG *egisa* f. 'fear, terror' points to a substantivized oxytone adjective while the "erroneous" 9th century OHG hapax *egiro* 'id.' can point to an original barytone noun (Woodhouse 2000: 189 ff.). And is to be noted that in all these examples the difference of accent brings with it no difference of ablaut.

Rico (2003/2009: 184 f.) in fact invokes the *τόμος* series himself to explain the retraction of the accent in the zero grade forms in question, in particular to explain Gk. *σφάραγος*, which Rico glosses 'bruit', i.e. 'any loud, continuous noise', and successfully argues to be the basis not only for the compound epithets *ἐρισφάραγος* 'loud-roaring', *βαρυσφάραγος* 'heavy-roaring' and others, but also the verbs *σφαραγέομαι* '1. hiss, sizzle; 2. be full to bursting', and *σφαραγίζω* 'stir up with a loud noise';[4] and to which is thus related *σφρᾱγίς* 'seal' as the 'hisser' or 'sizzler' when applied to the wax or other sealing material. Not all of these ideas, including the comparison with other verbs with accented zero grade, such as Ved. *sphū́rjati* 'explode' and Lith. *spìrgti*[5] 'fry; sizzle', are new of course, but the logical progression of Rico's ideas is a welcome innovation in the discussion, which thus disposes of Beekes (1988: 74) claim that, as applied to *σφαραγέομαι*, "the accent rule does not work here either."

The Rix/Rico view appears to be confirmed by most of the above examples, not only the Greek but also Germanic **mŕto-* vs. Ved. **mrtó-*. To these can be added Rix's unpaired adjectives *βλητός* 'hurled, struck', *ἄκρᾱτος* 'unmixed, pure' and *τλητός* (Dor. *τλᾱτός*) 'patient, constant in suffering; endured; endurable'. Beekes (1969: 195–201) supplies in addition the nouns *κάλαμος* 'a reed'

[4] In fact, Rico (2003/2009: 165 n. 12) acknowledges Tichy (1983: 180) as the originator of the idea that the verbs derive from the noun.

[5] Though this last may have the ictus retracted by Hirt's law since the laryngeal in the zero grade **sprHg-* can be interpreted as following immediately upon the syllable head /r/.

and *παλάμη* 'palm of the hand' (with unavoidably advanced accent), as well as the pf. *τετρηχυῖα,*. Beside the originally adjectival privatives *ἄκμητος* 'unwearied, untiring' and *ἄδμητος* 'untamed, unbroken, wild' are other privatives based on original substantives, such as *ἀκάματος* 'untiring, unresting; without sense of toil' and *ἀδάματος* 'unbroken, untamable; unwedded', and other formations, such as *ἀκάμας* gen. *ἀκάμαντος* 'untiring, unresting', and *ἀκμής* gen. *ἀκμῆτος* 'untiring, fresh', which latter may have either zero or full grade of the root; and similarly *ἀδάμας* gen. *ἀδάμαντος* 'unconquerable, inexorable' and as substantive 'adamant = steel(?)', and *ἀδάμαστος* 'unbroken, untamable'. The aor. *ἐτάραξε* hardly counts because, according to Beekes (1969: 199), it has been remodelled on the basis of the noun *ταραχή* 'trouble, disorder' the divergent accent of which points perhaps to secondary substantivization, unlike the form beloved of Xenophon, *τάραχος* 'id.', which seems to preserve the original accent.

The chief exceptions in the above material are, in §1 above, *τετρώκοντα* and *γιγνώσκω*, which clearly have the typical accent placement of Greek words of their respective classes, *γιγνώσκω* no doubt having accent originally on the reduplicating syllable, judging by Vedic type *bíbharti*. In Hom. *κρᾰ̃ατος*, the long vowel of a stem form unfamiliar to the daily speech of later rhapsodes has possibly attracted the accent from its putative original place as may be judged by the contracted and tragic form *κρᾱτός*. Att. Ion. *πρῶτος*, Dor., Boeot. *πρᾶτος* 'first' are no doubt secondarily barytone as are all the other Greek ordinals of the first decade, except perhaps *δεύτερος* (Rix 1976: 171 f.).[6]

Sometimes the principle of the barytone noun vs. the oxytone adjective itself appears disturbed or reversed, e.g. *νέος* 'young, new' vs. *νεός* f. 'fresh or fallow land'. In addition, as mentioned above, the principle that the disyllabic reflexes result from secondarily accented zero grades places the developments near the end of the PIE period. Given, then, that sparingly attested Gk. *σφάραγος* has been shown to be the source of *σφαραγέομαι*, which instead of being a denominative could conceivably have originated as the type "1s" present, according to the scheme in LIV_2 (p. 19), with new zero grade root *σφαραγ-* and accented suffix **-éie/o-* from the outset, it seems possible that some time after the establishment of pairs of the *θάνατος* : *θνητός* type, the relationship between the two forms ceased to be

[6] The best etymological suggestion for the pair I have come across is that of Rix (1976: 73), viz. *πρῶτος* is due to contamination of original *πρᾶτος* < **prh₂-to-* by *πρότερος*. It is hard to accept Beekes' (2010 s.v. πρῶτος) idea of different laryngeals in the protoforms. Waanders' (1992: 378) ingenious derivation of the pair from instrumentals in **h₁* of masc. **pro-*, fem. **preh₂-*, though not without merit, is a little expensive. A possible alternative, which might account better for the extensive dialectal coverage of Att. Ion. Arc. Cypr. Lesb. *πρῶτος* (for which see Waanders l.c.) and also mirrors Beekes' (2010 s.v.) new view of Gk. πρωκτός : Arm. *erastank'*, is that *πρῶτος* represents an innovative *o*-grade **proh₂-to-* prompted by **pro*.

productive, apart from the barytone : oxytone principle which still remained in force. This would enable oxytone adjectives having the basic shape of barytone nouns to be explained on the basis of a lost barytone noun. Thus *ταναός* 'stretched, tapered, tall, long' and *μαλακός* 'soft' would presuppose the former existence of **τάναος* *'a stretching, lengthening, something stretched or lengthened' and **μάλακος* *'softness, a softening, something soft'.[7]

Beekes in fact does something very similar to this in order to explain the noun *τάλαρος* 'basket' < *'bearer, thing that bears' (or preferably *'something carried'?) in Beekes (2010 s.v.) by suggesting, somewhat oddly, precisely the reverse development from a putative adjective **ταλαρός* "with regular shift of accent" and inviting readers to compare *λαγαρός* 'slack, emaciated, thin' (l.c., s.v. *λαγαίω* 'release') and *χαλαρός* 'slackened, flaccid, loose, lax' (l.c., s.v. *χαλάω* 'slacken'). Yet both these last derivatives indicate a passive meaning, which leads one to suspect that Beekes' alleged adjective **ταλαρός* should mean something like 'borne, carried' and that consequently *τάλαρος* is an original noun meaning 'bearer' or possibly 'something borne or carried'. In addition an original adjective meaning 'borne' should have had the shape **τληρός* (Dor. **τλᾱρός*) (cf. Gk. *τλητός* Dor. *τλᾱτός* < **tlh$_2$-t-ó-*), in other words employing the same general pattern as *σκληρός* (< **sklh$_1$-r-ó-*) 'hard, brittle, harsh, severe' < *'dried up, withered, hardened' to *σκέλλομαι* 'dry up, wither, languish, grow tired, harden' (< **skelh$_1$-*, l.c., s.v. *σκέλλομαι*) – note that Beekes himself (l.c., s.v. *σκέλλομαι*) encourages comparison of these two roots, **skelh$_1$-* and **telh$_2$-*, and their derivatives. Of the other two adjectives mentioned, *λαγαρός* and *χαλαρός*, apart from the fact that Beekes suspects that both derive from non-inherited roots, only *χαλαρός* could possibly reflect the *CRHC* structure under review and if it does, then, like *μαλακός*, it must ultimately be based on a lost barytone noun having the same pattern as *τάλαρος*, and meaning perhaps *'something made slack', but "with regular shift of accent" to make the conversion to oxytone adjective.

Other alleged Greek exceptions are as follows.

The 'wool' word *λῆνος* (see Beekes 1969: 195) appears to have ancient accent on the initial, zero grade syllable, cf. Ved. *ū́rṇā-*, BSl. **wíl̥na-*, but this may be due to late parallel developments and indicate a mobile paradigm. There is another peculiarity in the Greek form, viz. early loss of the anlaut laryngeal, which may be in keeping with an expected earlier oxytone.

The Greek 'wives of brothers' word *εἰνάτερες* derives from **Hienh$_2$-ter-* (Beekes 1969: 195; 2010: s.v. *εἰνατέρες* [sic, with misprinted accent]) and so is of

[7] Beekes' (2010 s.vv. *ταναός*, *μαλακός*, *βλᾰ́ξ*) explanations of ταναός < **tnh$_2$euo-* and *μαλακός* < **mlh$_2$-ek-* seem unnecessarily ad hoc. Beekes (l.c., s.v. *ταναός*) is right, however, to reject the attempt at a laryngeal-free etymology by Rico (2001) (whom Beekes refers to as "Christophe"!) in view of the many cognates Beekes cites as requiring laryngeal, including SerboCroat (not Slovenian!) *tȁnak*.

no concern here. Similarly, Hom. nom. pl. *γαλόῳ*, gen. pl. *γαλόων* are probably from *γαλάϝ-ω-* < acc. sg. **ĝlh₂-éu-m* with **ō* from the nom. sg. as Beekes (1976: 15; 2010: 259) suggests; they are thus irrelevant to the present discussion. Finally, Beekes (2010 s.v. *χθών*) agrees with Rico (2004: 99–102) (though probably not with Rico's reconstruction with two reduced vowels) that Gk. *χθαμαλός* does not require a laryngeal, so this word is off the board as well.

Regarding the precise mechanism leading to the dual outcomes, it is worth paying attention to the highly informative experimentally based investigation of likely PIE laryngeal properties by Reynolds/West/Coleman (2000). These authors also see both outcomes as emerging from the same phonological *RH* segment but representing different durations and timing sequences in the co-production of the two elements (p. 372). Since these scholars regard the laryngeals as metrically weak vowels, they assign these co-production timing sequences to two of their graphic representations on p. 366, which we can represent as follows:

CRĒ$_i$C: R
HHH
Time →

CE$_i$RE$_i$C: R
HHH
Time →

Although Reynolds/West/Coleman do not explain how the differences in timing arise they do indicate (2000: 371, 377) that, other things being equal, the fact that the resonant precedes the laryngeal is enough to make the resonant the syllable head. This seems to be an adequate explanation of why *CRĒ$_i$C* represents the unaccented outcome. In the accented case the representation of the resonant happens to be slightly delayed in favour of the 'vocalic' laryngeal yielding *CE$_i$RE$_i$C*. In each case the resonant appears to yield its mora to that of the laryngeal, yielding the single bimoraic vowel in the first (unaccented) case and the two monomoraic vowels in the second case.

Based on all of the above, I find the Rix/Rico account, now increasingly subscribed to also by Beekes,[8] to be the superior and henceforth shall refer to the two Greek structures as the unaccented (*CRĒ$_i$C*) and (secondarily) accented (*CÉ$_i$RE$_i$C*) outcomes of *CRHC* and *CŔHC*, respectively.

[8] This welcome change of outlook on Beekes' part gibes much better with the Beekes (1985: 156–158) that wrote the theory of the rise of the *o*-grade replacing zero grades and eventually becoming accented as well.

3. Clackson (1994: 41) is attracted by the superficial similarity between the Armenian formula *CaRaC* and the Greek one *CÉ$_i$RE$_i$C* but since no such similarity is then found between Arm. *CaRC* and Gk. *CRĒ$_i$C* Clackson rejects any thought of a parallel between the dual outcomes in the two languages. This conclusion is seemingly supported by the alleged mismatches that Clackson focuses on between cognates in the two languages, viz. Arm. *kʻarasun* '40' : WGk. *τετρώκοντα* and Arm. *čanačʻem* 'I know' : Gk. *γιγνώσκω*, to which we can add Arm. *arāǰ* 'first' : Dor. Boeot. *πρᾶτος*, Arm. *kałin* 'acorn' : Gk. *βάλανος* and Arm. *całr* 'laughter' : Gk. *γαλήνη* 'calmness of weather'.[9] This position probably represents the communis opinio. Reynolds/West/Coleman (2000: 356), for example, link descriptively the Greek *γένεσις* type with the Armenian *čanačʻem* type as alternatives to the *-γνητος* type.

I think this view is unhelpful. If one examines the variant reflexes in each of the two languages one observes that in both cases in Greek there is a vowel after the resonant and two vocalic morae in the reflexes, while in Armenian there is always a vowel before the resonant and the number of vocalic morae varies between the two reflexes. When these differences are set aside, both languages have in common that one form in each language has more vocalic morae after the resonant, i.e. Gk. *CRĒ$_i$C*, Arm. *CaRaC*, than the other form (which may have as few as zero in this position), i.e. Gk. *CÉ$_i$RE$_i$C*, Arm. *CaRC*. Thus I propose that the forms that should be paired are Gk. *CRĒ$_i$C* = Arm. *CaRaC* and Gk. *CÉ$_i$RE$_i$C* = Arm. *CaRC*. When that is done the four pairs of examples cited in the preceding paragraph as showing divergent developments fall completely into line, the first three illustrating the first of these two equations, the last two the second.

We are now in a position to apply these results to a rule presented by Francis in his unpublished PhD thesis (1970), which, anticipating what follows, I propose to call Francis' law.

4. My information on Francis' law is drawn almost entirely from Clackson's (1994: 41–49) treatment of it. The law can be stated for the time being thus: *Ci*/*uh$_{2/3}$C* > Gk. **Ci*/*uĒ$_i$C*, and illustrated by *ἐβίων*, *ζωός*, *πρόσωπον*, *δηρός*, (Arc.) *ζᾱτός*, *ζητέω* (both reflecting **dih$_2$-tó-*), *ἠνορέη*,[10] *Πᾶν*, *ζωρός*, *μωρός*.

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[9] As we have seen in §2 above, the **e* in Beekes' (2010: 257 f.) reconstruction **ĝlh$_2$-es-* for this pair is superfluous; it is not even justified by the accent on the middle syllable of the Greek word since this is advanced from its original position on the initial syllable by the normal rules of Greek accentuation.

[10] Normier's etymology for this word, as cited by Clackson, requires the addition of the anlaut laryngeal, thus **h$_1$su-h$_2$nor-* > **ehwānor-* > **eānor-* with anlaut **e* absorbed by the following **ā*, there being no old inherited matter with onset ***eā-* in the word list of Beekes 2010.

Francis' law has found few supporters because there are said to be counter-examples. Clackson (l.c. 42–44) gives the following list, drawn from the work of various scholars: **ὀπί̄πη*, *πῖθι*, *πί̄νω*, *γλωχί̄ς*, *ἔ̄φῡ*, *πολύτῑτος*, *ἐχῖνος*, *βρί̄θω* (if IE, see Beekes 2010 s.v. *βρί*), *θῡμός*, *κί̄νημα*, *κί̄νησις* (> *κῑνέω*), Myc. *qi-wo* (anthroponym), if to Lat. *vīvus*,[11] and *πλῦ́νω*.

Looking at these two lists, we observe that in the first one, i.e. the list of examples supporting Francis' law, the syllables in question are generally unaccented. The two questionable cases are readily resolved. They are: *Πᾱ́ν* < **pwāhe/on-*, for which Ved. *pūṣán-* < **puh₂sé/ón-*[12] has the accent on the required syllable, and *ἐβίων*, which must have originally been accented on the augment as in Vedic, the rightward shift of the accent having taken place after the dissolution of the segment containing the laryngeal because the shift was conditioned by the result of the dissolution. In other words this list contains no secure counterexamples to the principle that Francis' rule as stated above applies only to unaccented zero grades.

This last phrase should alert us to the possibility, apparently not noticed until now,[13] that Francis' law is essentially a special case of *CRHC* restricted to the values of *R* = *I*, i.e. **i*/**u* and *H* = **h₂*/**h₃*. This in turn suggests the possibility that the so called counterexamples represent no more than the secondarily accented variety of the same segments.

This is indeed what we find in the list of alleged counterexamples, although there are a few special cases requiring discussion. The Vedic cognate of the imperative suffix in *πῖθι* is usually accented *-dhí*, forcing us to consider that the leftward movement of accent in this and *πί̄νω* and the present tense forms of other verbs must have taken place before the dissolution of these segments containing laryngeals – which in the case of Greek is not hard to believe. Similarly *ἔ̄φῡ* must take its vocalism from non-augmented forms with retracted accent, such as. inf. *φῦναι*; while *πολύτῑτος* is based on gen. sg. *πολυτί̄του* and other forms with long final syllable.

Beside these *θῡμός* appears to be the only real exception, but the connection of this word with Hitt. *tuhhima-*, though favoured by Kloekhorst (2008 s.v. *tuhhai-zi*), is too uncertain to be relied on – in Kloekhorst's example the word seems to refer to something audible, making his gloss 'smoke' hardly appropriate;[14] see also discussion by Beekes (2010 s.vv. *θῡμός*, *θῡ́ω*/1, *θύω*/2) who is disinclined to commit

[11] And Gk. *βίος* with *ι* shortened before vowel < **gʷíh₃os*.

[12] Clackson, reporting Normier, writes **puh₂son-* but **puh₂sén-* satisfies Brugmann's law.

[13] True, Clackson makes a connection between the unaccented zero grades in his more extended treatment of *δηρός* and *erkar* (1994: 112115) but instead of seeing them as such he refers to them as "*thème* II ablaut of the root rather than zero grade" (l.c. 113f.) and thus denies himself the possibility of reaching the unifying solution presented here.

[14] Russian *slyšu zapax roz* 'I catch (lit. hear) the scent of roses' notwithstanding.

himself on the precise nature of the laryngeal. Consequently nothing prevents the reconstruction *d^huh_1-*mó*- which, with *h_1, is no longer input for Francis' law.[15]

If this is accepted then a number of awkward decisions in Beekes (2010) can be rescinded. These include: (1) the envisaged schwebeablaut for *ἐβίων*, *ζωός* (s.vv. *βιω*-,[16] *ζώω*) and *δηρός* (s.v.); (2) the alternative etymologies with unlikely *e*-grade of the root for *ζωρός*, *ζητέω* (s.vv. and below); (3) the original derivation with short *α* for *ἠνορέη*; (4) the unnecessary ablauting paradigm in the case of *Πάν* (s.v.);[17] (5) the alleged difficulty of etymologizing words meaning 'stupid' in attempting to connect Ved. *mūrá*- and *μωρός* (s.v.); and (6) the qualification "(which is doubtful)" attached to the Dutch scholar's derivation of *πρόσωπον* (s.v.) which is based without acknowledgement on Francis' law.

Beekes' (l.c.) preferred etymologies for *ζωρός* and *ζητέω*, alluded to above, are *ieh_3-*ró*- and *ieh_2-*tó*-, respectively. The latter suffers from the disadvantage that we might expect the zero grade in this form, which, if Beekes' law operates, would give Arc. *ζατός*[18] with short root vowel, as in the verbs *δατέομαι* and *πατέω* which Beekes (l.c.) cites as models for *ζητέω*, whereas length is required not only in *ζητέω* itself but metrically also in both *ζᾱτεύει* (Alcman 33.8) and *ζᾶτεισ*' (Theocritus 1.85), which in turn suggest that length is also required just as much in *ζᾱτός* as in *ζητός* – indeed it is curious that, according to Beekes' etymology, only the full grade of this root is attested in Attic-Ionic, a disability not suffered by the etymology that supports Francis' law, which can thus be regarded as superior.

Summing up for Greek: if we distinguish *R* = *M* = **l, *r, *m, *n* from *R* = *I* = **i, *u* then we have unaccented *CRHC* > Gk. *CME$\bar{}_i$C* (Rix) and *CI$\bar{E}_{2/3}$C* : *CĪC* (Francis' law) beside secondarily accented *CŔHC* > Gk. *CÉ$_i$ME$_i$C* (Rix) and *CĪC*.

5. How similar, then, is Armenian to Greek in the matter of Francis' law?

First let me propose that in the two Armenian formulae for the reflexes, unaccented *CaRaC* and secondarily accented *CaRC*, the segment *aR* may represent no more than the usual reflex of the syllabic resonant. In the case of this being *I* = **i*/**u*, this leads to an expectation that unaccented *CIHC* > Arm. *CIaC* (cf. *CaRaC*),

[15] It is not particularly surprising that the duality of outcomes is absent in the case of the most recessive of the laryngeals, *h_1 (cf. the strength hierarchy of laryngeals proposed by Eichner 1988: 131), combined with the two most vocalic of the resonants.

[16] With a somewhat different account of Francis' findings.

[17] Beekes concludes his entry on *Πάν* thus: "Doubts by Mayrhofer EWAia 2 s.v.", which is somewhat misleading: Mayrhofer (l.c., s.v. *pūṣán*-) in fact lists plentiful literature representing various points of view, including the derivation based on Francis' law, without much commentary beyond "sogar" for the last named.

[18] Unfortunately the solitary, incomplete inscription attesting this form (viz. IG 5(2), 4: 22) appears to be unmetrical, giving no guidance regarding the length of the first syllable of the word.

while secondarily accented *CIHC* > Arm. *CIC* (cf. *CaRC*). Clackson (1994: 44–46) finds there are three Armenian outcomes for *CIHC*, viz., *CI̯ā*C, *CIāC* and *CĪC*. Since quantities are not preserved in Armenian, these are the equivalent of *CI̯aC*, *CIaC* and *CIC*, two of which – I suggest the first and the last, *CI̯aC* and *CIC* – correspond to my predictions. Thus *CI̯aC* represents originally unaccented zero grade, while *CIC* reflects secondarily accented zero grade, the remaining form, *CIaC*, being a blend of the other two. Thus the unaccented zero grade in Arm. *erkar* < **dwar-* makes it the exact equivalent of Gk. *δηρός*, while Arm. *kʿaw* < **twa-* can be the exact equivalent of Gk. **σαϝος* or descendant of PIE **puH-tó-* (Clackson 1994: 43f., 177f. leaves open the question of which etymon is to be preferred).

The longish lists of words with Arm. reflexes *i* and *u* that Clackson goes on to provide represent the secondarily accented zero grade, as is appropriate in the case of the several monosyllables that appear in these lists. Thus we appear to have here another exact equivalence of early development in Greek and Armenian.

6. We may prefer to view the above-deduced shared early development of four treatments of *CRHC*, dictated by the nature of *R* and the position of the accent, in much the same light as Clackson (1994: 33) views the shared Greek and Armenian intolerance of anlaut **r*, i.e. as an areal development testifying to a period of close proximity of the two languages rather than to their actually forming a linguistic unity.

Another shared feature pointing to such a period of proximity is the replacement of anlaut laryngeals by vowels in the two languages. Clackson (1994: 35) may be right to reject this as a would-be shared development that might point to a period when the two languages were one, but I think the fact that the anlaut laryngeals were retained until a later period when they were transformed into vowels, even though in different ways, can be taken as a shared feature contributing positively to the thesis of a period of close areal proximity.

I think this period of close proximity enables us to explain Gk. *αὐχήν* 'neck, throat; isthmus' as an early loan from Armenian of the forms antecedent to Arm. *awji-kʿ* 'collar', *awj* 'throat' < (quasi-?)PIE[19] **h₂ngʷʰ-* which stands beside **h₂éngʷʰ-* > Aeol. *ἄμφην* in Martirosyan's (2010: 154) ablauting paradigm. This circumvents some of the difficulties associated with the connection of these forms and, if the Armenian accent had already begun its rightward migration during this period, it might also explain the difference in accent between *ἄμφην* and *αὐχήν*.

The other main impediment to the connection here proposed is that Beekes (2010 s.v. *αὐχήν*) relying on Clackson (1994: 107–109), regards as controversial

[19] Beekes (2010 s.v. *αὐχήν*) suggests the Armenian word may be a loan from an Anatolian language.

the development *$h_{2/3}NK^w$- > Arm. *awK̂*- that is found in the two words under consideration and in two other Armenian items, viz.

awj 'snake' cf. Lat. *anguis*, Lith. *angìs* 'id.'; modifying Martirosyan's (2010: 153) treatment slightly we have: PIE *h_2ng^{wh}-*i*- > PArm. *$an^wg^{wh}i$ > *$awĝ^hi$ (with *g^{wh} > *$ĝ^h$ after[20] *u/w) > *awj-i-; and

awcanem 'anoint; gild; etc.' cf. Lat. *unguere* 'anoint', Ved. 3. pl. *añjánti* 'id.; smear', PCelt. **amban* 'butter'; once again modifying Martirosyan's (2010: 153) treatment slightly we have: PIE *h_3ng^w- > *Hn^wg^w- > *aug̑- > *awc*.

In fact Clackson (l.c. 107) does not succumb to Pedersen's objection that *$ĝ^h$ should yield Arm. *z* between vowels "(as *ozni* 'hedgehog' < *$oĝ^hīn$-)", including after *w*, but overcomes it by pointing out that this need not apply after the secondarily developed resonant.

Clackson (l.c. 108) does, however, cite as counterexamples Arm. *ankanim* 'I fall' < *$seng^w$-, *hing* '5' < *$penk^we$ and perhaps *anjuk* 'narrow' if < *$ang^{wh}u$-, for which last reconstruction Clackson cites Lehmann (1986: 60) and de Lamberterie (1990: I.267) as sources. These proposals are easily overcome. The first two items do not have anlaut *$h_{2/3}$ and so do not meet the input conditions for the change and are therefore not counterexamples. The third is impossible in PIE:[21] the labiovelar may exist in cognate forms with a different suffix or different grades of the same suffix but before PIE **u* itself any labiovelar is automatically delabialized, as several scholars have seen, including Brugmann (1897: 595f., 603f., 607, 611), Persson (1912: 270–274),[22] and more recently Steensland (1973: 24f., 27f., 39, 43, 111, 114, 117). The truth of this principle can be further demonstrated by the absence of verb roots in LIV_2 containing a labiovelar actually or even potentially in contact with a following PIE **u* and also by a trawl of Pokorny (1959) for similar material. The last named procedure yielded me only three items requiring comment, viz.:

*g^wou- 'bovine animal', the protoform of which is reconstructed with *h_3 interposed between the labiovelar and the **u* by Derksen (2008 s.v. *govèḍo*), Beekes (2010 s.v. *βοῦς*), de Vaan (2008 s.v. *bōs, bovis*) and Martirosyan (2010 s.v. *kov*), the last-named citing Lubotsky, Schrijver and Nassivera as authorities;

*$g^wōu$- : *$g^wū$-d^h- 'filth, excrement': the critical second item is illustrated only by Slavic material, which, being satem, cannot provide any proof of the

[20] Martirosyan actually writes "before *u/w" here, but since there is no *u/w following the tectal, it is clear this is an error for "after *u/w".

[21] The arguments that follow were originally written for a paper (designated MS) still under adjudication and are reproduced here abridged.

[22] These can hardly be falsified by reference to languages discovered/deciphered since – Tocharian, the Anatolian languages and Mycenaean Greek.

preservation of a PIE labiovelar; while Lat. *būbinō -ināre* 'to soil with menstrual blood' probably represents non-Lat. **bovinō* (Pokorny 1959: 484 following Walde/Hofmann 1965 [1938] s.v.; Persson 1912: 273) and, being non-inherited, is ignored by de Vaan (2008); and

**k*^{w}*u-* 'where; when; etc.': as Brugmann (1897: 595, 603) saw, the sparse data for this – Greek (Cret.) *ὅπνι*, (Syrac.) *πῦς*, (Rhod.) *ὅπῡς* 'where to?', Osc. *puf* 'where', *puz*, Umbr. *puze* 'that, as' – are too susceptible to analogical restoration of the semantically critical initial consonant to provide secure evidence of a surviving labiovelar in the protoform. As for the long debate over the vocalic anlaut of Lat. *ubī* 'where', *ut(ī)* 'how, as', *unde*, *uter* beside *ali-cubi* 'somewhere' etc., in which the expected delabialized reflex is preserved only medially in some non-interrogative forms, I think Brugmann's (1897: 604) example of *nec-opīnus* (beside *in-opīnus*, not ***in-c-opīnus*) supports his contention that a misanalyzed or reanalyzed *ne-c-* was deleted to re-form the interrogative forms and at the same time gives the lie to Schrijver's (1991: 262f.) unsupported claim that *nec-ubi* should have resulted in the preservation of the anlaut velar rather than assisted in its removal. Moreover, Schrijver's (l.c.) attempt based on Lat. *vapor* to support Joh. Schmidt's (1893: 405f.) sound law for *ubī*, fails because the proposed protoform for *vapor*, PIE **k*^{w}*h*$_2$*up-*, like **g*^{w}*h*$_2$*ou-* 'bovine animal', does not have the labiovelar in contact with **u*. Further, Schrijver's contention that only the pure velar **k* + **u* yields *qu-* in the equation Lat. *quatio* = OS *scuddian*, Lith. *kutė́ti* cannot be verified because these words (can) reflect an original labiovelar delabialized by the following **u*, the combination subsequently being represented in Latin by anlaut *qu-* in the much the same way as **h*$_1$*ek̂uos* > Lat. *equus*, which latter word testifies eloquently to the fact that *Kwu* and/or *K*^{w}*u* in daughter languages need not point to the same segments in PIE.

7. Some specifications have been indicated above of the relative chronology of the dissolution of *CRHC* segments and leftward and rightward shifts in the accent place of Greek verb forms. This relative chronology is summarized for convenience here:

1. leftward accent shift: **ph*$_3$*i-d*^{h}*í* > **píh*$_3$*-D*^{h}*i*;
2. dissolution of *CRHC*: **píh*$_3$*-D*^{h}*i*> *πῖθι* 'drink!', **h*$_1$*é-g*^{w}*ih*$_3$*-m* > **é-biō-N*, **ĝí-ĝnh*$_3$*-sk-* > **gí-gnō-sk-*;
3. rightward accent shift: **é-biō-N* > *ἐβίων* 'I came', **gí-gnō-sk-* > *γιγνώσκω* 'I know'.

It would be interesting if this sequence were to be confirmed by other data.

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