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respectively.² Gelb and Bonfante, *JAOS* 64 (1944) 169ff., pursued the implications of this proposal in extenso, concluding that Lycian and HLUvian were 'satem' languages, while CLuvian and Hittite belonged to the 'centum' group.³ Such a claim naturally aroused considerable controversy. Opponents, who far outnumbered supporters (see Gusmani's discussion), explained away the HLUvian examples by the same means as the Lycian: borrowing or conditioned sound change. Borrowing seemed an attractive explanation for 'horse', given the 'Aryan' elements in the Hittite horse-training texts, but it was less appealing for 'dog' and 'horn'.

Goetze, *Lg* 30 (1944) 404f., proposed as an alternative that PIE **k* underwent conditioned palatalization before **u*, not only in Luvian, but also in Hittite, adducing the Hittite examples *šwəa* 'fill' (~ Grk. *κῶεω* 'be(come) pregnant', Skt. *śvayati* 'swells up'), *šuppi* 'pure' (~ Skt. *śubh*- 'bright', Av. *spənta*- 'holy', etc.) and *šuppala*- 'animal' (*šū* ~ Av. *šū*- 'cattle'). Since this change affected Hittite, clearly a centum language, Goetze concluded that this development must be a combinatory change in both Hittite and Luvian. He explicitly denied that HLUvian was a satem language. Goetze's Hittite examples have generally been rejected, superseded by other etymologies,⁴ but his explana-

² Actually, the derivaton *šurmi* < **k̑rmo*- (explicitly e.g. Gusmani, *FsPagliaro* 2.299) is problematic. The assumed treatment of **r* as Luv. *ur* would be unparalleled and contradicted by solid examples like *parm*- 'house' < **prn*-. On the other hand, derivation of *šurmi* from an oblique **k̑raun*- (cf. Hitt. *k(a)rauar/k(a)raun*- 'horn') is also difficult. However, given the existence of the other two examples of *š* < **k̑*, the root etymology of *šurmi* has hardly been doubted.

³ In *HH* 3.59ff. Gelb argued that the relative/interrogative pronoun in HLUvian should be read *k̑i*, which would make HLUvian a 'regular' satem language with delabialization of labiovelars. Today most scholars read the relative sign non-committally as REL. For its likely phonological value see note 15 below.

⁴ Kammenhuber, *RHA* 58 (1955) 2f., pointed out that HLUv. *šwəa*- 'fill', the cognate of Hitt. *šwəa*, is always spelled with the *š* sign (320), never with sign 448, Gelb's *š*, which reflects **k̑u*. Thus both HLUv. *šwəa*- and Hitt. *šwəa*- must continue **š*, not **k̑*. The accepted etymology of *šwəa*-/*šwəa*- 'fill' (and related forms) is that given already by Sturtevant, *Lg* 7 (1931) 168: PIE **seuh₂*- 'press out liquid' (Skt. *sunōti* 'press out etc.). For Hitt. *šuppi*- 'pure, sacralized, taboo' < **seup*- (Hitt. *UZUšuppa* ~ Umbr. *sopo/supa* 'sacralized flesh') see Watkins in *Languages, discourses, societies. Pour E. Benveniste* (1975) 208ff. For Hitt. *šuppala*- 'animal' < **sup(p)*- (cf. Lat. *animalia suppa*) see Watkins, *JES* 1 (1973) 394ff. Güterbock and Hamp, *RHA* 58 (1956) 24, had suggested that Hitt. *šwəwəya*- 'look at' continues a **k̑wei*-, source also of OIr. (*ad*-) 'cf' 'sees' and related Celtic forms. This etymology, which requires that the Celtic words be separated from Skt. *cētati* 'perceives' etc. < **k̑ei*-, has simply been ignored. Oettinger, *Stammbildung* 396, reconstructs *šwəwəya*- as **sewah₂-ye*-, but gives no PIE etymon.

H. Craig Melchert

PIE velars in Luvian *

1. Introduction

The velar consonants of Luvian have been the subject of considerable discussion. Debate has centered on two points: (1) alleged 'satem' treatment of PIE velar stops in Luvian (and Lycian) by which these appear as sibilants *š*, *ś* or *z*; (2) apparent weakening of *k* to *h* (or \emptyset) in both Cuneiform and Hieroglyphic Luvian.

1.1 'Satem' in Anatolian

The history of the debate over 'satem' elements in Indo-European languages of Anatolia is conveniently summarized by Gusmani, *FsPagliaro* 2 (1969) 281ff. An early suggestion by Meriggi, *FsHirt* 2 (1936) 257ff., that Lycian was a satem language met with indifference or rejection. Examples such as Lyc. *esbe* 'horse', *šñta* 'hundred' and *šiyēni* have to this day either been rejected, taken as borrowings, or explained by a conditioned sound change: see e.g. Pedersen, *LH* (1945) 50f., Neumann, *HbOr* (1969) 368, and in detail Kronasser, *ArOr* (1957) 513ff.

The question was renewed with the suggestion of Gelb, *HH* 3 (1942) 19ff., that the HLUv. sign 448¹ should be read *š* with a palatal sibilant. This sign appears in HLUv. *šwəwə*- 'horse', *šwəwəna/i*- 'dog' and *šurmi* 'horns', patently derived from **ek̑wo*-, **k̑(u)won*- and **k̑rmo*-

* Abbreviations of Hittitological works are those of the *Chicago Hittite Dictionary*, edd. Hans G. Güterbock and Harry A. Hoffner, The Oriental Institute of the University of Chicago, 1980-. I transliterate HLUvian signs according to the revised system of Hawkins, Morpurgo-Davies, and Neumann, *Hittite Hieroglyphs and Luvian: New evidence for the connection* (= *NAWG* 1973 No. 6), Göttingen, 1974. See also the summary by Hawkins, *AnSt* 25 (1975) 153ff., and further additions, *AnSt* 31 (1981) 148. I am indebted to Jeffrey Willis and Professor Anna Morpurgo-Davies for many helpful references and suggestions.

¹ I follow here the numbering of HLUvian signs by Laroche, *Les hiéroglyphes hittites* I, Paris, 1960.

tion of the HLUvian cases cited above by a conditioned change $*k\acute{u} > \acute{s}u$ (or su) has been widely adopted: see e.g. Kammenhuber, loc. cit. The lengthly and impassioned attempt of Gusmani, *F3Pagliaro* 2.281 ff., to resurrect satem forms in Anatolian has to my knowledge been effectively ignored.

1.2 $k > h/\emptyset$ in Luvian

The matter of loss of k in Luvian arose with the equation by Laroche, *BiOr* 11 (1954) 123, of CLuv. $i\acute{s}(ša)ri-$ with Hitt. $keššar(a)-$ 'hand' and CLuv. $*im(ma)ri-$ (in $(im(ma)rašši-)$ with Hitt. $gim(ma)ra-$ 'open field'. Laroche termed the lack of initial velar in Luvian 'curious' and heatedly denied, *RHA* 60 (1957) 28, n. 34, that he was proposing a 'sound law' Hitt. $ki-$ = CLuv. $i-$ (see Friedrich, *ZA* NF 17.256 and *HE* 1.184). Indeed, the apparent counterexample of CLuv. $kisā(i)-$ 'comb' beside Hitt. $kisā(i)-$ 'idem' has caused considerable confusion.

The correct solution was already seen, however, by Ivanov, *Chetst-kij Jazyk* (1963) 85 and *Symb. Kurylowicz* (1965) 131 ff., and by Scheller, *IF* 69 (1964) 38 ff.: PIE voiced velars are lost in Luvian ($*ghešr- > i\acute{s}(ša)ri-$, $*ghešmro- > im(ma)ri-$), while voiceless velars are preserved ($*kes- > kisā(i)-$). Ivanov in the second work cited above noted that this explanation will also account for several other examples adduced by Laroche, *BSL* 58 (1963) 77 ff.: CLuv. $*parri-(parrai-)$ 'high' $< *bhṛgh(i)-$, CLuv. $*mai-$ (in $mayāšši-$) 'crowd, mass' $< *megh_2(i)-$,

⁵ This example should probably be rejected in favor of Laroche's earlier derivation of $mayāšši-$ from $LU\text{-}maya-$ 'grown man, adult' (*DLL* 65): see also Ivanov, *Symb. Kurylowicz* 133, n. 10. It is likely that voiced stop plus $*h_2$ led to a geminate stop in Luvo-Hittite: cf. 2nd pl. imv. mid. $-dānuwa(ri) < *dh_2we-$. We would therefore expect Luuv. $*makk-$ (or $*mazz-$; see below) $< *megh_2-$ with a geminate stop treated like a PIE voiceless stop: cf. Hitt. $mekēk(i)-$. Second, based on the parallel with $tiyammim-$ $< *dhegh_2m-$, $*megh_2(i)-$ should give only Luuv. $*mi-$ with i -vocalism. On the other hand, the alternation between CLuv. $mayāšši-$ 'of the assembly' and HLUv. $miya(n)t-$ 'many', Lyc. $miñtis$ (group which oversees the tombs) is quite consistent with derivation from $māi-$ 'grow': cf. hitt. $maya(nt)-$ and $mriyant-$ 'grown'. Since it is likely that both the Lycian $miñtis$ and the Hittite $pankw-$ consisted of adult males (Hitt. $paṅgawaš\ lalaš$ 'tongue of the assembly ~ Luuv. $mayāššiš\ EME-aš$), the derivation from $māi-$ is also semantically satisfactory. On the Hittite $pankw-$ see now Beckman, *JAOs* 102 (1982) 435 ff. As for HLUv. ma 'much' (KARATEPE LVIII 324 ff.), it need not be read $*man$ and taken as nt. nom.-acc. sg. of $*mai-$ (see Hawkins and Morpurgo-Davies, *AnSt* 28 (1978) 113 f.). Since final stops are lost in Luvian, ma (sic!) could continue directly the old consonant-stem nt. nom.-acc. sg. $*megh_2$ (attested in OHitt. $mēk$) preserved in adverbial usage.

CLuv. $tiyammim-$ 'earth' $< *dhegh_2m$.⁶ The examples of Laroche which imply loss of voiceless $*k$ are either dubious (for *Luwī(ya) < Lukī-* see Laroche's own reservations, *DLL* 65) or open to other explanations (LUv. iterative suffixe $-s(i)- < *s-$ -like Hitt. iterative $-š-$ and Toch. AB 'causative' $-s-$ beside $*-ske/o-$ as per Ivanov).⁷

Recent studies have provided further examples of loss of voiced velars in Luvian, and Oettinger, *MSS* 34 (1976) 101 f., has proposed that CAnatolian $*g$ (from any source) regularly disappears in Luvian initially and intervocally. In addition to $i\acute{s}(ša)ri-$, $im(ma)ri$ and $tiyammim-$, he cites HLUv. $wawa-$, Lyc. $wawa/wawa-$ 'cow' $< *g^wou-$ and HLUv. $twawtri-$, Lyc. $kbaitra-$ 'daughter' $< *dhugh_2tr-$.⁸ We may now add also CLuv. $wanatti-/wanatti-/wana-$ 'woman' $< *g^wen-$ (see Starke, *KZ* 94 (1980) 74 ff.) and CLuv./HLuv. $u-$ 'drink' $< *eg^wh-$ (see Morpurgo-Davies, *KZ* 94 (1980) 106, n. 24, and Hawkins in *Death in Mesopotamia* (1980) 221).⁹

Further examples are possible. Morpurgo-Davies apud Hawkins, *KZ* 94 (1980) 114, has suggested that HLUv. $wala-/wara-$ 'die' and CLuv. $(u(wa)lanti-$ 'dead' are to be derived from $*g^wel-$ 'suffer, die'. However, one could as easily equate the Luvian forms to Toch. A $wäl-$ 'die' $< *wel-$, so this example is quite uncertain.

In the article cited, *KZ* 94.117, Hawkins quotes the HLUv. passage ASSUR e, 2, which contains the phrase: $a-sa-ta-ri + i...$ PRAE-na ARHA-'MORI(-)wa/i-wa/i-ri + i-ta-ti. While the ending of the verb is obscure, Hawkins is surely correct in viewing ARHA $wawari-$ as a reduplicated form of $wala-/wara-$ 'die'. The ablative $a-sa-ta-ri + i$ could therefore be read as /astari/ and interpreted as 'from/by hunger'. HLUv. $ast(a)-$ would equate to Hitt. $kašit-$ 'hunger': cf. the famous Hit-

⁶ Since at that time HLUv. 'this' was read \bar{i} , Laroche, Ivanov and Scheller all also considered the possibility that it reflected PIE $*ghis$. This derivation is now obsolete, of course, with the correct reading of HLUv. 'this' as $za-/zi-$.

⁷ Gusmani, *F3Pagliaro* 2.301 ff. and 332, wholly ignores this alternate suggestion of Ivanov, insisting instead on trying to derive both $-s(i)-$ and $-ške-$ ultimately from $*-ske/o-$. For HLUv. /tuwatri-/ 'daughter' see Hawkins, *KZ* 92 (1978) 112 ff. For the reading as an i -stem contra Oettinger compare CLuv. $SAL-du(ta)riyattis$ cited by Starke apud Hawkins, *AnSt* 30 (1980) 151. Gusmani, *F3Pagliaro* 2.318, in his zeal to find satem forms, reconstructs $*dhug(h)ater-$ with a palatal! What we are to do with Av. $dugadar-$ we are not told.

⁹ I assume first loss of the velar element as in the other examples, giving $*ew-$. This new diphthong then monophthongized to $u-$ -like inherited $*ew$. For the correct root etymology of Hitt. $ekw-$ etc. as $*eg^wh-$ see Puhvel, *Hittite Etymological Dictionary* (1984) 267 f., with references.

tite expression *kašti piran akk-* 'die of hunger' in *Madd.* Vs 11. Obviously, this etymology based on a single occurrence is far from certain.¹⁰

The examples cited thus far seem to suggest an unconditioned loss of voiced velars in Luvian, but HLuv. *takami* (dat.-loc. sg.) 'to/in the country' contradicts this. Hence Oettinger's limitation of velar loss to initial and intervocalic position (assuming *takami* is /dagmi/ < **dh ghm*-).¹¹ Even with this restriction, however, there remain problems, despite the assertion of Oettinger, *MSS* 34.106, that there are no counterexamples. CLuv. *katmarsī-* 'defecate' (~ Hitt. *kam(m)arš-* 'idem') has been persuasively derived from PIE **ghed-* (cf. Toch. B *kenmer* 'excrement' for the first part of the suffix); see Tischler, *HEG* 474, for references. Perhaps the preservation of *k-* may be attributed to the 'affective' value of the word, but at least superficially *katmarsī-* < **ghed-* is a counterexample to loss of initial voiced velars.

HLuv. *kutasri-* 'orthostat' beside Hitt. *kutt-* 'wall' also makes problematic the popular derivation of the latter from **ghew-* 'pour' (see Tischler, *HEG* 677). Hitt. *hurkil-* 'atrocious, abomination' has been derived from **h₂wr-g̃h-* or **h₂wr-g-* (*HEG* 302). If CLuv. *hurkilāšši-* is genuine Luvian, the preservation of -*g-* here contrasts with loss in *parri-* < **bhr̥gh(i)-* cited above.¹²

Some of these problematic cases may involve false etymologies; others could be due in principle to borrowing from Hittite, although there is no independent evidence to support this. My purpose here is merely to emphasize that the conditioning for velar loss in Luvian is not yet entirely clear, and one could entertain formulations other than Oettinger's given above.¹³ One important fact does seem assured: all

¹⁰ If **Ko/est-* 'hunger' is from the same root as Hitt. *kiš-* 'be extinguished', then derivation from a **ges-* 'be extinguished, exhausted' (Skt. *jāśate*, Lith. *gėsti*) is possible, giving us another example of loss of voiced velar **g-*. On the problems of this etymology and alternatives see Tischler, *HEG* 535ff.

¹¹ Oettinger, *MSS* 34.106, n. 9, also considers the possibility that **g* was lost after a sonant consonant (to permit *parri-* < **bhr̥gh(i)-* as above). However, if one assumes a zero-grade of the root and preservation of syllabic **r* into Proto-Luvian (by no means impossible), then one may retain his original formulation.

¹² Although it does not violate Oettinger's rule, it is worth pointing out for the sake of completeness the preserved velar in CLuv. *papparkewā(i)-* 'cleansed', related to Hitt. *parkui-* 'clean', which has been derived since Sturtevant *CGr.* 122 from **bh(e)rh₂g̃-* *wō-*.

¹³ E.g., given the general instability of voiced labiovelars in Indo-European languages, one could suppose that loss of the velar element in **g^w(h)* is unconditioned, while other voiced velars are lost only under certain conditions. Note that in CLuv. *u-ttiš* the

convincing cases of velar loss involve *voiced* stops. There is no good evidence for loss of voiceless velar stops in Luvian.

Laroche, *DLL* (1959) 135, also alleges a few instances of *k > ḫ* in Luvian. None of his examples, however, is compelling. The equation of CLuv. *luḫta-* 'light' (?) with Hitt. *luḫka-(a)-* 'dawn' rests on nothing but phonetic similarity. If CLuv. *šahḫa-* does mean 'dirt', it may go with Hitt. *šah-* 'clog, befoul', just as well as with Hitt. *šakkar* 'excrement'. CLuv. *nahḫuwa-* is equated by Laroche with Hitt. *nakkešš-* 'weigh upon, worry', but the usage of the word (all examples in *KBo* IV 14) is just as compatible with a meaning 'be afraid' and equation with Hitt. *nah(ḫ)-* (thus originally Friedrich, *JCS* 1 (1947) 304).¹⁴ The meaning of CLuv. *šahuidara-* is quite uncertain, and equation with Hitt. *šakuwāššara-* 'preserved, whole' faces multiple phonological difficulties: not only *-ḫ-* : *-k-* but also *-i-* : *-a-* and *-tara-* : *-ššara-*. Finally, CLuv. *manna(hu)wanni-* and *mannaḫuni-* (*DLL* 68) may not be the same word: see Meriggi, *WZKM* 53.216ff. Convincing examples of *k > ḫ* in Luvian may yet appear, but present evidence for such a change is weak.¹⁵

2. PIE Voiceless Velars in Luvian

In contrast with the loss of voiced velar stops, PIE **k^w* and **k* are regularly preserved in Luvian.

velar loss is not clearly intervocalic (although one could always assume **eg^wh-* > **eg^wh-* > **eh-*).

¹⁴ For the impersonal use of the verb compare Hitt. *nu-tta lē nahḫi* 'Do not be afraid!', which is not an irregular use of the 2nd sg. impv. with *lē* (where the enclitic *-tta* would also be irregular), but a perfectly regular prohibitive with 3rd sg. ind. *nahḫi* and *-tta* as direct object: 'Es fürchte dich nicht!'

¹⁵ Alleged weakening of labiovelar (only labiovelar!) **k^w* to *hw* in HLuvian (not CLuvian!) is a separate issue. Evidence for such a change is use of the REL₂ sign to spell (PES₂) (REL₂)REL₂-*ya-* (= CLuv. (ḫu)ḫuiya- 'run'). However, in other examples HLuvian REL/REL₂ corresponds to CLuv. *kui-* as expected: REL/REL₂-*ša-* 'be afraid' (/kwisa-/) ~ CLuv. *kuyaya-* 'idem'; REL-*za-* 'inscribe' (/kwiza-/) ~ CLuv. *kui-* 'idem' (not, however, related to Hitt. *kuen-* 'strike' < **g^when-*!); REL + *ra/i-* 'cut' = CLuv. *kur-*, Hitt. *kuer-* 'idem'. For all these forms and earlier literature see Hawkins, *AnSt* 25 (1975) 119, n. 9. Furthermore, HLuv. *kumana* (/kuman/) 'when, while' matches Hitt. *kuitman* 'while, until' with preserved *k^w* < **k^w*. On the phonology of the rest of the Luvian word see Laroche, *BSt* 55 (1960) 175. Since the use of the REL sign as the phonological sequence *hui/kui* is a kind of shorthand, replacing what otherwise would be a two-sign sequence *hu-i* or *ku-i*, it seems possible that its use as *hui* as well as *kui* is merely scribal license (there being no available unit *hui*). In view of *kumana*, this seems as likely to me as a sound change **k^w* > *hw* in all the other examples cited.

2.1 PIE *k^w > Luv. *ku*

The interrogative/relative pronoun *k^wi- appears in CLuvian as *kui-*. Compare also HLuv. *kuman* 'while, when' ~ Hitt. *kuitman* 'while, until' (on this word and the problem of the relative in HLuvian see note 15 above). Note that *kui-*, a consistent *i*-stem, shows Luvian /k^w/ (or /kw/) as the reflex of *k^w before a front vowel.¹⁶ Starke, KZ 95 (1981) 142 ff., has shown that CLuv. *kursāwar* means 'island', originally a verbal noun *'cutting' and ultimately to PIE *k^wer-'cut'. It is also virtually certain that *k^wer- is directly attested in CLuv. *kur-* (ptc. *kuram(m)i-i-1x* beside *karsāmmi-* 'cut' and inf. *kūrunna*) and in HLuv. REL + *ra/i-* 'cut' (on the latter see Hawkins, *AnSt* 25.143). I have suggested, *Studies in Hittite Historical Phonology* (1984) 164 (henceforth *SHHP*), that CLuv. *kuwaya-* 'fear' reflects a *k^weh,*i-* seen also in Skt. *cāyati* 'reveres' and Grk. τίω 'honor' (HLuv. REL-*sá-* would be the corresponding iterative /k^wisa-; cf. CLuv. *pīpīssa-* to *piya-* 'give'). CLuv. enclitic *-kuwa* almost certainly continues PIE *k^we (Carruba, *Part.* 72), although its precise synchronic function still eludes us. We thus have two sure and two likely examples of PIE *k^w preserved as Luvian /k^w/ (or /kw/).¹⁷

2.2 PIE *k > Luv. *k*

One example of Luv. *k* < PIE *k has already been cited: CLuv. *kisā(i)-* 'comb' < *kes- (OCS *česati* 'comb' etc.). Hittite shows both *kisā(i)-* like Luvian and athematic *kisš-* (on the latter see Oettinger,

¹⁶ The neuter nom.-acc. sg. of the relative/interrogative is spelled REL-*aza* in HLuvian, representing */kwanza/, and the ablative-instrumental is likewise REL-*ati* (*/kwa(i)/), but such *a*-stem forms merely reflect the regular pattern of *i*-stems in HLuvian: see Hawkins, Mörpurg-Davies, and Neumann, HHL 171 and 176.

¹⁷ Enclitic *-kuwa* provides one word-internal example. As in Hittite, morpheme-internal (root-final) examples of *k^w are hard to find. CLuv./HLuv. *tawa* 'eyes' (sg. stem *tawi-*) has been equated to Hitt. *šakwawa* 'eyes' and derived from the root *sek^w-. 'see' (e.g. Pokorny, *IEW* 898) or from *s + *ōk^wh₂*, i.e. *s + *h₃ōk^wh₂* (Eichner, *MSS* 31.82): cf. also Oettinger, *Stambildung* 395. However, as the Hittite single *-k-* shows, if this derivation is correct, then the voiceless *k^w was 'lenited' in Common Luvo-Hittite. Its treatment in Luvian would thus be that of an inherited voiced velar and its loss in *tawa* regular by 1.2 above. Equation of the Hittite and Luvian forms is by no means assured, however. (The alternative explanation by Puhvel, *IBS* 35 (1981) 316 ff., from a **dhyog^wh-* or **dhyag^wh-* falls because it presupposes loss of *y following assimilation of a preceding dental, which is contradicted by all available evidence: see 2.3.1 below.) Since Lat. *twor* (oldest meaning 'look at') and related forms require a PIE root **lew-* 'look at, observe', I believe we must consider the possibility that Luv. *tawi-* 'eye' is a derivative of this root and has nothing to do with *šakwawa*.

Stambildung 201). Oettinger, *Stambildung* 305, views Hitt. *kisā(i)-* as modeled on the Luvian verb. Whether or not this is true, I wish to stress two points: (1) there is no evidence to suggest that the Luvian verb is borrowed from Hittite; (2) the stem *kisā(i)-* cannot be secondarily derived from the athematic stem *kisš-* because in that case it would show the characteristic geminate *-šš-* of the latter.¹⁸

As to the source of the stem *kisā(i)-*, there are two possibilities, given its inflectional type. Oettinger, *Stambildung* 202, suggests that it may be a denominative **kēsā-yé-*.¹⁹ The noun **kesā* is pure construct, of course, but the productivity of denominatives in *-ā(i)-* in Luvo-Hittite makes such a derivation quite plausible. One should also consider the possibility that *kisā(i)-* continues a lengthened-grade iterative of the type of Lat. *cēlare* 'conceal': see P. Hollifield apud Watkins, *Flexion und Wortbildung* 373, regarding Hitt. *widā(i)-* 'bring'. Despite the summary dismissal by Oettinger, *Stambildung* 374, and my own arguments, *SHHP* 157 f., such an iterative remains possible for *kisā(i)-*, *widā(i)-* and *lisā(i)-* 'gather' beside *lešš-* (on the last pair see note 18). What is crucial is that by either derivation *kisā(i)-* continues a form with fixed *e-* or *ē-*grade of the root with no possibility of inner-paradigmatic leveling. Thus all evidence suggests that CLuvian *k* is the regular reflex of PIE *k before a front vowel.

CLuv. *karsš-* (ptc. *karsāmmi-*, inf. *karsūna*) certainly means 'cut' (now assured by *KBo* XXIX 4 II 3 ff.) and equals Hitt. *karsš-* 'idem' < **ker-s-* (Toch. AB *kāršt-/kāršt-*, Arm. *k'ērem* 'scratch' etc.). Since **ke-* becomes *ki-* in Luvian (see note 19), I assume that Luvian *karsš-* continues the weak stem **krs-*.

CLuv. *kattawatnalli-* 'plaintiff' (cf. Hitt. *kattawatar* '(grounds for) a quarrel') is based on **katu-* 'fight' (OIr. *cath* 'battle', Russ. *kotora*

¹⁸ The conditioning for the geminate *-šš-* in *kisš-* is too complicated an issue to treat here, but the geminate is clearly limited to the athematic stem. Compare likewise athematic *le/išš-* 'gather' beside *lišā(i)-* (see Oettinger, *Stambildung* 206). Pace Oettinger, there is no process by which the geminate in *kisš-* could have been 'lenited' to simple *-š-* in NH *kisā(i)-*. The single *-š-* of the latter regularly continues PIE *s (via Luvian or directly).

¹⁹ Oettinger reconstructs only lengthened-grade **kēsāye-*, but as he himself indicates, *Stambildung* 535, **ē* also leads to Luvian *i* after a velar (hence the unexpected *i-* of *išā(i)ri-* < **ghesri-*). By extending the rule to include a following velar, one can also account for the *i* of *triyammi-* < **dheghōm*, although one can also suppose that the **g* became **y* on its way to being lost, and that the **y* then raised the preceding **ē* to *i*. One does not expect in the first instance either *e-* or *ē-*grade in a verbal abstract in **-ā*, but both are attested: see Wackernagel-Debrunner II.2.251.

'quarrel' etc.).²⁰ CLuv. *kup-* 'plot' reflects either **keub-* (Gmc. **hupō-* 'hope') or less likely **keup-* (Skt. *kūpyati* 'gets angry' etc.): see Tischler, *HEG* 639 for references. I have also tentatively suggested, *JCS* 35 (1984) 139ff., that CLuv. *kiklimā(i)-* means 'plate with iron' and is derived from *kiklu-* 'iron' (perhaps 'the black/gray (metal)' < **kel-* seen in Grk. *μελαίνω* 'black' etc.). We thus find at least three certain and two more tentative examples of Luv. *k* < PIE **k*. This includes the case of *kisā(i)-* 'comb' before a front vowel.

2.3 PIE **k* > Luv. *z* ([*ts*])

One may note that there are no examples above of Luv. *k* < PIE palatal **k̥*. Remarkably, I am not aware that any such etymology has even been proposed, let alone won acceptance. I believe that this absence of Luv. *k* < PIE **k̥* is not an accident, but is due rather to the fact that the reflex of PIE **k̥* in Luvian is *z* (phonetically probably [*ts*]).

This is hardly a new idea. Gusmani, *FsPagliaro* 2.305, has suggested that Luv. *za-/zi-* 'this' is derived from **ke-/ki-*, and the thought has undoubtedly occurred to others. Tischler in *Das etymologische Wörterbuch* (1983) 281f., has also compared CLuv. *zar(r)iya-* (epithet of rivers) with Hitt. *karrit-* 'flood', CLuv. *zarpi-* (undesirable state) with Hitt. *karpi-* 'anger', and Luv. *zarza-* 'liver' with Hitt. *karat-* 'innards'. However, the first etymology has remained isolated (recall that for Gusmani and others the regular outcome of **k̥* in Luvian is *s* or *š*, as in 1.1 above). As for the others, the preforms suggested by Tischler all have initial voiced stops, which by 1.2 above we would expect to disappear entirely (or irregularly remain as *k-*).²¹

²⁰ For correct derivation from a **katw-* see already Čop, *Slav. Rev.* 8 (1955) 63. On the semantics see Melchert, *KZ* 93 (1979) 271. Both the morphology (*w*-stem) and the semantics argue that the Anatolian forms are related to Celtic-Germanic **katw-* 'fight, quarrel', not to Grk. *xóτος* 'spite, anger', contra Laroché, *RHA* 76 (1965) 57. If Skt. *śatru-* 'enemy' is related to the family of **katw-*, it would merely show another case of 'Gutturalwechsel'. However, the meaning suggests that *śatru-* be put rather with Grk. *kóτος* from an ablauting root **ke/ot-* beside **kat(w)-* with PIE **4*.

²¹ Hitt. *k(a)rit-* 'flood' continues **grit-* with a voiced **g̃* (cf. Av. *zraitiō* 'sea' etc. and see Tischler, *HEG* 510). Since Tischler also cannot explain the double *-r-* or lack of *-it-* in *zariya-*, the entire equation is best abandoned. As for *zarpi-* = *karpi-*, the meaning of the Luvian word is quite uncertain, as is the etymology of Hitt. *karpi-*. The equation remains possible, but it is much too dubious to be used as evidence for **k* > *z* in Luvian. On alleged *zarza-* 'liver' see 2.3.3 below.

2.3.1 Luv. *za-/zi-* 'this' < **ke-/ko-/ki-*

The comparison of Luv. *za-/zi-* 'this' with Hitt. *ka-/ki-* and derivation from **ko-/ki-* remains difficult to resist. There is first of all the striking parallelism between Hitt. *kā-/apā-*, Pal. *kā-/apā-* and Luv. *za-/apa-* 'this/thať'.²² So long as HLuv. 'this' was read *ī*, it seemed reasonable that CLuv. *za-* might also diverge from Hitt.-Pal. *ka-*. Now that HLuvian and CLuvian both have *za-/apa-*, the match with Hitt.-Pal. *kā-/apā-* is highly suggestive (a point properly emphasized also by Tischler).

Furthermore, the parallelism extends to the inflection of the demonstrative stem, which in both Hittite and CLuvian shows a strange mixture of *a-* and *i-*stem forms:

	Hittite		CLuvian	
	Sg.	Pl.	Sg.	Pl.
NC	<i>kāš</i>	<i>kē</i>	<i>zaš</i>	<i>zinzi</i>
AC	<i>kūn</i>	<i>kūš</i>	<i>zan</i>	<i>zinza</i>
NAN	<i>kī</i>	<i>kē</i>	<i>za</i>	<i>zā</i>

In CLuvian the singular has *a-*stem inflection, the plural an *i-*stem.²³ In Hittite the paradigm is much more complicated, and the forms with *e-*vocalism are ambiguous, since they can continue **ē* or **ī*.

Obviously, there has been considerable rearrangement of a CAnatolian paradigm, but it seems unlikely that the two languages independently developed such a mixed inflection with *a-* and *i-*stems. The CLuvian paradigm with *-a-* in the singular and *-i-* in the plural is to my knowledge unique in the language! A shared inflectional pattern does not, of course, guarantee the same base, but it increases the odds for a single Anatolian preform.

²² In Lycian we find only *ebe-* with the meaning 'this', while Lydian, as often, goes its own way with the obscure *es-* 'this'. The match among the other Anatolian languages remains striking.

²³ CLuvian nt. pl. *zā* reflects **zaya*, as shown by attested HLuvian *zaya*. The alternation *-a/-aya* in the nt. nom.-acc. plural of *i-*stem adjectives in Luvian is entirely parallel to that in Hittite (*šuppa/šuppaya* etc.), and the hesitation of Hawkins and Morpurgo-Davies, *AnSt* 28 (1978) 107, in equating the two is unjustified. Loss of intervocalic **y* is almost certainly Common Luvo-Hittite (see my discussion, *SHHP* 164), and in both languages contracted *-a* < **-aya* is the regular nt. nom.-acc. pl. *i-*stem ending. The form *-aya* is restored from the rest of the paradigm (in Luvian from forms like nom. pl. anim. *-ainzi*). See also *SHHP* 44 f.

There is also no viable source for Luv. *za-/zi-* other than the obvious **ko-/ki-* suggested by Hitt.-Pal. *ka-/ki-*. Laroche, *RHA* 63.109, n.2, lamely tries comparing Hitt. *ša-* 'this, that', but the only regular Luvian equivalent of Hittite *s* is likewise *s* (see the examples cited in 2.3.5 below). Laroche's alleged examples for Luv. *z* = Hitt. *s* are false: *zakkar* beside *šakkar* 'excrement' and *zamanḫur* beside *šamanḫur* 'beard' are inner-Hittite alternations (cf. *parzahannaš/pirašahannaš*, ¹⁰ *paḫḫurzi-/paḫḫurši-*, *gulzi-/gulšš-* etc.).²⁴

Nor can Luv. *za-/zi-* 'this' be derived from **tyo-* (cf. Skt. *śya-/śya-* 'this, that').²⁵ The reason is phonological: Luv. *za-* cannot continue **tyo-*, because the product of assibilation **tyo* in Anatolian is in all clear cases *z(t)ya*, whence *zi*, not *za*. Hittite locative adjectives in **tyo-* appear in OHittite as *-zziya-*, later as *-zzi-* (e.g. *šarazzi(ya)-* 'upper'). Lyc. *hrzzi-* 'upper' shows the same development. Within Luvian itself compare HLuv. *Ma₁-l₁-zi* for cuneiform *Mi-li-di-a* (Malatya), as cited by Hawkins, Morpurgo-Davies and Neumann, *HHL* 161f. We now have also HLuv. *ha₁-zi-mi-na* 'we will inscribe', cognate with Hitt. *ḫazziya-* 'strike; inscribe' < **h₂et-ye-*, as per Oettinger, *Stammbildung* 346 and *MSS* 34.125.²⁶ Unlike assibilation of **t* before syllabic **i*, which is unique to Hittite, the change **ty > zi* ([tsy]) appears to be Common Luvo-Hittite, and the only attested outcome in the 'Luvoïd' languages is.

²⁴ This irregular development of *š* to *z* next to a consonant (principally a sonant) is shared by Luvian, most notably in the *-ša* particle regularly postposed to neuter nom.-acc. singulars: beside CLuv. *utar-ša* and *āḫar-ša* we find also *zār-za* and *adduwal-za*. This means that in a particular example one might find Luvian *z* matching Hittite *š* next to a sonant (or vice-versa!). Aside from this special environment, however, Hitt. *š* equates to Luv. *s*.

²⁵ Although to my surprise I have not yet been able to find this etymology in print, it is well-known and seems to have occurred independently to more than one person.

²⁶ Since this crucial equation has been based heretofore largely on the mere phonological resemblance, it is worth examining the single occurrence of HLuv. *hazimina* in some detail (CEKKE rev.5; cf. Meriggi, *Man.* II/1.110): *ā-wa/i ARHA + RA/l₁-ya-ta-sa ha₁-zi-mi-na / wa/i-ta tā-ā + ra/i-za INFANS-ni-wa/i-za-ha ki-tara/i-sa (VINCERE) hi-sá-hi-mi-na*. These two sentences are immediately followed by a long list of personal names in a repeated formula: from such-and-such a city so-and-so and his son so-and-so. I believe that this context makes the interpretation of the preceding sentences reasonably clear: 'We will inscribe (them) in order/seriatim (lit. 'of a circle/series'). We will bind a *kitar-* on the fathers and sons'. HLuv. *ARHA + RA/l₁-yala-* would be **irha-yatt(a)-* 'circle, series', cognate with CLuv. *irḫatt(a)-* 'idem', a verbal noun to the verb seen in Neo-Hittite *irḫā(i)-* 'make the rounds of, (worship) in series'. On the alternation HLuv. **irḫayatt(a)-/CLuv. irḫatt(a)-* see note 23 above. For Hitt. *ḫazziya-* as 'inscribe, engrave' see *KBo* IV 10 Rs 22.

that which preserves the **y* as *i*. Thus Luv. *za < *tyo* with loss of the **y* is impossible.

Since Hawkins, Morpurgo-Davies and Neumann, *HHL* 180ff., allege other examples of a change **tyo > Luv. za*, I must pursue this point in detail. They propose that Luvian stems in *-nza-* continue **-ntyā-*. Specifically, they suggest that an *nt-*stem such as *Tarḫunt-* was extended by *-i-* (attested in *Tarḫunti-*). The *i-*stem then acquired an alternate accusative in *-iyan* (cf. *tatim/tatīyan* 'father'). By assibilation the new accusative **Tarḫuntīyan* became *Tarḫunzan*, whence analogically a new nominative *Tarḫunzas*.

In addition to contradicting the clear examples above of Luv. *zi < *tyo*, this account faces other serious difficulties. Hawkins, *AnSt* 25 (1975) 143, has convincingly interpreted HLuv. *VIR-tiyaiyaza* as *zitiyan-za* 'male(ness), virility', a substantivized nt. nom.-acc. sg. of the adjective *zitiyanti-* 'male' (with postposed particle *-za*, as often). As elsewhere in HLuvian, the *i-*stem adjective has a secondary nt. nom.-acc. sg. in *-(i)yan*. Note, however, that the sequence remains *unassibilated!* We would thus expect the proposed secondary animate accusatives in *-nt(i)yan* such as **Tarḫuntīyan* to remain unassibilated, and in fact the evidence suggests that they do. The personal name *HALPA-parntiyasa* (i.e. */Halparuntiyas(/)* cited in *HHL* 182 presupposes an accusative **Halparuntīyan*, likewise without assibilation. Furthermore, this name cooccurs in MARAŞ 4,1-2 with *Tarḫunzan*, and in BOHÇA 3-4 we find (DEUS) *TONITRUS-huzasa* (*/Tarhunzas(/)* together with (DEUS) *CERVUS₂-tiyasa* (*/Runtiyas(/)*). How can the stem *Tarḫunza-* reflect *Tarḫuntīya-* contemporaneously with preserved (*Halpa*) *runtīya-*? All the evidence we have argues that secondary sequences of *-(n)tyā-* which are created in Luvian remain unassibilated, as we would predict if **ty(o) > zi* is Common Luvo-Hittite as indicated above. Stems in *-nza-* (NB: all examples have *-n-*) continue *-nt-* directly: see Stefanini, *FsMerigg²* (1979) 609.²⁷

²⁷ Stefanini speaks of 'thematization' of *-nt-*, without going into details. I assume that at some point the nom. sg. in */-nts/*, as the functionally 'unmarked' or zero member of the paradigm, was reinterpreted as stem */-nts-/* plus \emptyset ending. The new stem */-nts-/* then spread to at least the accusative, producing */-ntsan/*, whence analogically a new nom. sg. */-ntsaš/*. This scenario is not purely hypothetical, since in Hittite an original 'hysterokinetic' paradigm nom. sg. **su(h₁)-mén + s*, acc. sg. **su(h₁)-mén-ḫ* (cf. Grk. $\psi\mu\eta\nu$) appears as nom. sg. *šum(m)anza/šum(m)anzaš*, acc. sg. *šummanzan 'cord'*, where the anim. nom. sg. ending */-nts/* has become the stem of the accusative, leading ultimately to a new nom. sg. in */-ntsaš/*. The situation in the Hittite example is complicated by a further oblique stem *šum(m)anzar-*, but the latter only reinforces the main

Luvian adjectives in *-iza-* are another matter: e.g. HLuv. *nimi-wiza-* 'child, son' (NB MARAŞ 4,1 (INFANS) *ní-mu-wa/i-i-za-sa*) and 'ethnic' adjectives like HLuv. *Karkamisiza-* < *Karkamisa* and CLuv. *URUTaurisizza-* < *URUTauriśa*. Hawkins, Morpurgo-Davies and Neumann, *HHL* 183, compare this suffix to Lyc. *-zi-* which also forms ethnic adjectives such as *Atānazi*, *Spartazi*, *Surezi* as well as *prīnezi* 'οἰκέτης. Gusmani, *AION* 3 (1961) 43f., has plausibly derived the Lycian suffix from locative **-tyo-* (as in *hrzzi-* 'upper' cited earlier). From its original locus of forming locative adjectives from adverbs, the suffix would have spread to 'house' and then place names, all interpretable as 'locations'. The supposed equation of Luv. *-iza-* with Lyc. *-zi-* is extremely dubious, however. The Lycian suffix may be taken in all cases as simply *-zi-*, as expected from **-tyo-*, with the preceding vowel belonging to the stem of the nominal base. The Lycian vowel is in any case always *a* or *e*, reflecting Luvooid **a*, never *i*. However, note that the Luvian suffix is not *-za-*, but *-iza-*, with an *-i-* before which the final vowel of the base noun is deleted (!): *Karkamisa* → *Karkamisiza-*. This difference is not trivial, and taken together with the evidence cited earlier for **tyo* > Luv. *zi*, it argues that Luv. *-iza-* (sic!) has nothing to do with Lyc. *-zi-*.²⁸ For a possible source of Luv. *-iza-* see 2.3.6 below. Luvian verbs in *-za-* will be treated below in 2.3.5. Again, there is no good evidence that any of them continue **(n)tyo-*.²⁹

point: /-nts/ has spread directly from the nominative singular to other parts of the paradigm. See Melchert, *Sprache* 29/1 (1983) 9f., and compare Oettinger, *KZ* 94 (1980) 48ff.

²⁸ It is true that one does find occasional ethnic adjectives in *-aza-* beside *-iza-*: e.g. CAR-CHEMISH A 14 b,2 *Kar-ka-mi-sa-za-sa* beside usual *Kar-ka-mi-si-za-* or BOYBEYPI-NARI I B-C *Zá-[ki]-ta-za-sá* beside BOYBEYPI-NARI III B 1 *Zá-ki-ti-za*. This does not affect the argument for *-iza-* as the original form of the suffix. Starting from an original *-za-*, there is no way to motivate *-iza-*. On the other hand, it is hardly surprising that the synchronically peculiar process by which stem-final *-a-* is replaced by the *-i-* of *-iza-* would occasionally be suppressed.

²⁹ In fact, the HLuvian stem *izi(ya)-* 'do, make' is probably the true representative of a verb stem in **-tyo-*. See already the comparison by Eichner, *Sprache* 25/2 (1979) 205, with ON *iðja* 'do' < *ið* 'deed' (fem. *i-stem*). However, from an *i-stem* we would expect a denominative verb **(e)i-ti-yé-*, and **t* should not assimilate before **i* in HLuvian. Syncope to **(e)itye-* would lead to the desired result, but we have no independent basis for such a syncope. Contrast in fact CLuv. *kaluti(ya)* 'make the rounds of' < *kalutti-* 'circle'. Thus *izitya-* remains problematic. Since some skeptics still doubt the reality of this stem (see Puhvel, *HEG* 344f.), it is worth pointing out that its existence as Common Luvo-Hittite is assured by the Hittite middle *izzattari* 'appears, materializes' (of a ghost) at *VBoT* 133 Vs 7: cf. Puhvel, *HEG* 504, and Tischler, *HEG* 456, for previous attempts to explain away this example.

To return to our point of departure, Luv. *za-* 'this' < **tyo-* is phonologically impossible, since **tyo* leads via *z(i)ya* to Luv. *zi*. Obviously, neither the parallelism with Hitt.-Pal. *ka-* nor the lack of any other convincing etymon for Luv. *za-* 'this' proves that it continues **ko-/ki-*. Hence this patent etymology by itself has not convinced a majority of scholars to accept the sound change which it presupposes: PIE **k* > Luv. *z*. In what follows I will attempt to show that there is in fact solid support for such a development.

2.3.2 CLuv. *ziyar(i)* 'lies' < **keyo-*

CLuv. *ziyari* occurs in a broken context at *KUB XXXV* 68,8, while *ziyar* is found in the following ritual passage *KUB XXXV* 54 II 29ff. (dupl. *KBo* XXIX 2 II 8ff.):³⁰ ... *katt[a]* *hiki* *n-aśta anda kiśšan memai zāwi ziyar NUMUN.ĪLA-na [(p)]ūnāta inzagān waśha*. The duplicate *KBo* XXIX 2 II 9 has *[z]iyari*. Laroche, *DLL* 115, leaves *ziyar* and *ziyari* unanalyzed, but Neu, *StBoT* 5 (1968) 212, already hesitantly identifies the forms as pres. 3rd sg. middle of a verb stem *ziya-*. This analysis is undoubtedly correct. The unusual position of the verb is probably conditioned by the deictic adverb *zawi* 'here, voici': cf. *KBo* XXIX 6 Vs 19 *zawi-ata wiśta*...

NUMUN.ĪLA-na is nt. nom.-acc. plural 'seeds'. The meaning of *pūnāta* is unknown, but it clearly is a result noun in the nt. nom.-acc. plural to the verb (*anda*) *pūna-* which occurs earlier in the same ritual at II 15. It may or may not be the collective plural to the animate noun *punati-* (*DLL* 82), for which compare *tawa* to *tawi-* 'eye'. The form *inzagān* is now assured as a noun (nt. nom.-acc. sg.) by the new occurrence *inzagan-za* at *KBo* XXIX 6 Vs 25 with the postposed particle *-š/za* which often accompanies nt. nom.-acc. singulars. Laroche, *DLL* 155 and 108, tentatively identifies *waśha* as pret. 1sg. of a verb, but this does not fit the context. Actually, *waśha* is the perfectly regular nt. nom.-acc. plural of the adjective *waśhai-* 'sacralized, pure' (or similar) which is used in *KBo* VII 68 II 6ff. to describe various ritual offerings and those who present them.³¹ For nt. nom.-acc. plural *waśha* beside *waśhayiya* compare Hitt. *šuppa* beside *šupraya* to *šuppi-* 'pure, taboo' and see note 23 above.

³⁰ For a transcription of this text see now Starke, *StBoT* 30 (1985) 62f. and 67. Compare also Laroche, *DLL* 154, who did not have the duplicate *KBo* XXIX 2 at his disposal.

³¹ Laroche's tentative interpretation, *DLL* 109, of *waśhai-* as 'lord, master' (following Meriggi) is simply impossible, given the virtual paradigm of the word offered by *KBo* VII 68 II 5ff.: *pa-ti-aś adma aśa* [...].³¹ *waśšan-za waśhayan-za NINDA-ya-x-x waśhaiš NINDA, iannaśa waśhayiya NINDA-iš waśhaiš GIS-zappallalla KI.MIN DUG-x-x-iš KI.MIN*

We thus have a middle verb, three neuter nouns and a nt. nom.-acc. plural adjective. The middle verb and the lack of any animate subject (or object) argue that the neuter nouns are the subject of the verb, which is either intransitive or passive (3rd singular as usual with a neuter plural subject). The meaning of the verb is established by the ritual action prescribed in the preceding Hittite. The celebrant 'offers down-ward' (*katta ħink-*) various objects. The use of *katta* with *ħei(i)n* *k-* 'hand over, offer' is to my knowledge unique, but the meaning is clear. The ritual objects are being placed either on the ground or in a sacrificial pit (*ḫattēššar, āpi-*). We are thus led to the following interpretation: 'One offers down ... and inserts the following words: "Here lie/are placed the seeds, the *p*. (and) the *i*, sacralized."' ³²

Functionally *ziyar(i)* matches Hitt. *kittā(ri)* 'lies' and 'is placed' (see Neu, *StBoT* 5.87, for both meanings). Formally, *ziyar(i)* continues **ħey-o-*, with the older 3rd sg. middle ending *-o (cf. Skt. *śāye* 'lies' < **ħey-oi*) vs. Hitt. *kittā* with *-to (cf. Skt. *śēte* < **ħēi-toi*). ³³ The existence of CLuv. *ziyar(i)* 'lies' renews the question of whether Lyc. *siyēni* is a form of 'lie', although the ending remains problematic (cf. 2.4 below).

2.3.3 CLuv. *zār-za*/HLuv. *zar-za* 'heart' < **ħēr*

CLuv. *UZU zārza* occurs at *KUB XXXII* 7, 12 in a broken context, but the determinative assures us that the word is a body part. In *KUB*

paṛšul-za KL.MIN x-x-x-*aiū* KL.MIN *maddū* KL.MIN x-x-x-*iš* KL.MIN LÜNINDA-DÜ.DÜ-*aš* KL.MIN [LÜSILA.ŠU]-DU-*iš* KL.MIN LÜSÄ.TAM-*aš* KL.MIN 'They sit down (?) to eat ... The *w*. is pure, the *h*-bread is pure, the *t*-breads are pure. The bread is pure, the *z*. likewise, the ___-vessel, the crumb-cake, the ___ (and) the wine likewise. The ___ is pure, the baker, the drink-server and the chamberlain likewise.'

³² It is possible, though less likely, that *wašḫa* is a substantivized adjective parallel to the other nouns: 'seeds, *p*., *i*. (and) the sacralized things'.

³³ CLuv. *ziya(ri)* is thus the missing cognate of Skt. *śāye* which Watkins, *Idg. Gram.* III/1 (1969) 85f., sought to find in Hitt. *kiya* (*KUB XXXVI* 109, 11), a form which has subsequently been shown to be *ki-ya* 'also this'.

The root-middle 'lie' in PIE has a fixed stem with accented *e*-grade of the root: **ħēi-* (see Watkins, *Idg. Gram.* III/1.113, and already Brugmann, *Gr.* 2.3.97). We cannot therefore derive *zi-* from a zero-grade **ħi-*. Furthermore, the **y* in **ħey-o* would not have formed a diphthong, being intervocalic. Since intervocalic **y* disappears in Luvian as well as in Hittite (cf. note 23), I assume the following development: **ħeyo* > **ħe-a* > **ħi-a* (see note 19) > *zi-a* > *ziya* (with new hiatus-filling *y* after *i*). Note that the rule which produced **ħi-* from **ħe-* here also led to *ki-* < **ħes-* 'comb' at the same time. Hence the different outcome of the consonant cannot be attributed to the following vowel.

XXXV 72 III 3 we find the Hittite instruction *nu uzunig.GIG*... 'And the liver ...' followed in III 7 by Luvian *pā zar[za...]*. HLuvian confirms the word as a body part (*KULULU* 13,6-7): *atahasazi-pa-wa-wa nu DEUS-nizi zarza ARHA aratu* 'Let the *a*. gods devour his *z*.!'.³⁴

Poetto, *KZ* 95 (1981) 274ff., has argued on the basis of these facts (esp. *UZUNIG.GIG* 'liver') that *zarza* means 'liver'. His argument that objects mentioned in the Hittite instructions often recur in the following Luvian incantations is certainly correct. However, the context of *KUB XXXII* 72 is very fragmentary: we have only the first few signs of each line. The parallel HLuvian passages cited by Poetto (in which gods or their dogs are to eat whole persons, their heads, their family, or their eyes) show that we are dealing here with a banal sort of curse by which malefactors are to be treated like carrion. Any reminiscences of the very special myth of Prometheus conjured up by the meaning 'liver' are purely accidental. All that the HLuvian occurrence shows is that the word refers to a vital body part.

Since Poetto himself admits that *UZUNIG.GIG* is always accompanied in Luvian rituals by *UZUŠĀ* 'heart' (see *DLL* 124)³⁴, the equation of *UZUNIG.GIG* with *zarza* in *KUB XXXII* 72 is far from assured. Chances are equally good that *zarza* matches a missing *UZUŠĀ*.³⁵ Formally, *-za* is likely to be the particle *-šā/-za* postposed to nt. nom.-acc. singulars. This leaves *zār*, which would continue directly **ħēr* (cf. Hitt. *ķir* 'heart').³⁶ The expected oblique stem would be *zart-* < **ħyd-* (cf. Hitt. *katrd-*), which may well be attested in CLuv. *zarti* (*KUB XXXV* 133 II 4, broken context).³⁷

³⁴ Likewise in Hittite rituals *UZUŠĀ UZUNIG.GIG* is a frequent collocation: see e.g. *KUB XII* 15 VI 13, XV 34 IV 20, *KBo XIX* 142 II 21.25.

³⁵ As indicated by Poetto, *KZ* 95.276, n.13, Kalaç had already ventured 'heart' for HLuv. *zarza*.

³⁶ It is often claimed that PIE **ē* > Luv. *i* (e.g. Oettinger, *Stammbildung* 535), but none of the examples adduced is compelling, and there are examples suggesting PIE **ē* > Luv. *ā* instead: e.g. CLuv. *aišhar-ša* (*KUB XXXV* 109 III 13 following *wāin* 'woe') is almost certainly 'blood' with postposed *-ša* (*aišhar* = Hitt. *ēšhar* < *(*h*₁)*ésh₂r*). The entire problem cannot be treated adequately here. The question may be moot for 'heart', however, because it is very likely that the rule raising **e* to *i* after velars (see note 19) applied to long **ē* as well. We thus expect **zir* < **ħēr* in any case. However, the vocalism of *zār* could easily be due to paradigm leveling from the oblique stem, which would have been *zart-* < **ħyd-*.

³⁷ I am now happy to report that D.Hawkins and A.Morpurgo-Davies have independently concluded that *zar-za* means 'heart', based on the evidence presented here and additional material from HLuvian. Their study, to appear in a volume for Giovanni

2.3.4 HLUv. *wazi(ya)*- 'demand, ask for' < **wek-*

HLuv. *wazi*- occurs in a figura etymologica in ASSUR f.3: *parali-ha-tu* ("*205") *atumari REL-na* ("*69") *wazana* ("*69") *wazihana wa-(n)za* OMNIS-*MI-za* "VIA"-*wani* 'Also which *w*. we *w*-ed you from/with the *parali-atuni*-, send all to us'. Morpurgo-Davies, KZ 94 (1980) 99, to whom we owe the interpretation of *-hana* as 1st plural preterite, suggests from the context a meaning for *wazan wazihan* of 'we requested a request'. The sign 69 probably is a form of hand (see Laroche, *HH* 43), which would make a suitable determinative for 'ask for, demand'. I believe that this meaning is confirmed by another occurrence of *wazi*- (without determinative) at KULULU 1,2-3: *wa-ti zaya DOMUS-na REL-sa Tuwatiya waziti* 'Whoever demands this house (coll. pl.) from Tuwati for himself. Since this sentence is followed by a curse, the meaning of the verb obviously is either 'destroys' or 'takes away' (cf. Meriggi, *Manuale* II 50 'sottrae(?)). The presence of the reflexive particle *-ti* argues decisively for the latter. The root **wek-* can mean '(peremptorily) demand' as well as 'request' (cf. e.g. Hitt. *wek-* in *KBo* XXII 2 Rs 12; *StBo* T17. 12). Thus *waziti* 'demands' seems a sufficiently strong expression of a threat to take away the house.

Formally, *wazi(ya)*- may be derived from a virtual **wek-ye-*, with the extension in **-ye/o-* so common in both Hittite and Luvian (cf. CLuv. *katmarsī(ya)*- 'defecate' beside Hitt. athematic *kam(m)arī-*).³⁸ The verbal noun *waza*- 'request, demand' would be parallel to Hitt. *harga-* 'destruction' < *hark-* 'perish' and others.

2.3.5 CLuv. *-z(z)a-* (iterative suffix) < **-ʒe/o-*

HLuvian shows a number of verb stems in *-za-* such as *IRA-laza*- 'be(come) angry' and *asaza-* 'speak'. For CLuvian we may cite the Glosenkeil form *kappilazza-* 'become angry' (*KUB* XIV 8 I 23). Since all the examples just cited have nominal bases (cf. respectively Hitt. *harsallant-*

Pugliese Carratelli, also discusses some of the other examples of *z* < **k* treated here, although they reach rather different conclusions concerning the phonological developments. I am grateful to the authors for making a manuscript of their article available to me in advance of publication.

³⁸ The stem (*69) *wazi-* 'demand, request' must be kept separate from *PES₂(-)waza-* (contra Meriggi, *HhG* 2, 147) because: (1) the latter is always preceded by *PES₂* (in fact we cannot be sure that the stem *waza-* is complete); (2) the stem is always *PES₂(-)waza-* vs. (*69) *wazi-*; (3) *PES₂(-)waza-* appears to have the meaning 'drive/transport (by chariot)'.

'angry', *aīš* 'mouth' and *kappilalli-* 'hated', one could suppose that *-za-* is a denominative suffix. Indeed, Hawkins, Morpurgo-Davies, and Neumann, *HHL* 185, raise this possibility for *IRA-laza-*, assuming **harsallantya-* > **harsallanza-*. Likewise, Hawkins and Morpurgo-Davies, *JRAS* (1975) 133, interpret *asaza-* 'speak' as *asanza-* < **assantya-*. However, we have seen above that **tya* leads to Luvian *zi*. Furthermore, denominative verbs in **-ye/o-* should inflect according to the *mi-* conjugation, and clear examples in Luvian do so: CLuv. *kaluti(ya)*- 'make the rounds of' (3rd sg. *kalutitti*) < *kalutti-* 'circle'; HLuv. **hariani(ya)*- 'send' (2nd sg. *VIA-wanisi*) < *harwan(i)-* 'road'. But verbs in *-za-* inflect as *ʒi*-verbs: *asazai/asazaya* 'speaks', CRUS.CRUS- (*yaza*) *i* 'passes on' (see Morpurgo-Davies, *F5Szemerényi* 2.584 and 604).

There is another problem, recognized by Hawkins, Morpurgo-Davies and Neumann, *HHL* 185 f.: in several cases, stems in *-za-* alternate with stems in *-sa-*: *IRA-laza-IRA-(sa)lasa-*. This argues that *-za-* is an iterative suffix, and this is confirmed by examples such as *taza-* to 'stand'.³⁹ Since Luvian *-s(s)a-* had been equated with Hittite *-ške-* (see 1.2 above), the authors of *HHL* tentatively suggest that *-za-* may be cognate with Hittite iterative *-šša-*.

As to the alleged denominative examples with *-nza-* < **-ntya-*, we have seen above in 2.3.1 that this derivation is phonologically impossible. We should assume rather that the real denominative stems are in *-ā(i)-*: CLuv. **kappilā(i)-* 'be angry' (= attested Hitt. *kappilā(i)-* 'incite to anger'), HLuv. **assā(i)-* 'speak' (cf. CLuv. *ašš(a)-* 'mouth'), and HLuv. **IRA(-)zasalā(i)-* 'be angry' < *IRA(-)zasali-* 'angry'.⁴⁰ For other examples of denominative verbs in *-ā(i)-* in Luvian compare CLuvian *kuwatā(i)-* 'be afraid' < *kuwata-* 'fear' and HLuv. *sarlā(i)-* 'exalt, worship' < **sarli-* (SUPER + *RA/I-li-*) 'high'.

The verb stems *IRA-laza-*, *asaza-* and *kappilazza-* may thus be iteratives (of *ā(i)-* stems) like the other HLUvian examples. As for the source of the Luvian iterative suffix *-za-*, we have seen already that

³⁹ Contra Hawkins, Morpurgo-Davies, and Neumann, *HHL* 185, Luv. *az(z)a-* 'eat' is no iterative, but merely the expected cognate of Hitt. *ezz(a)-* 'eat', where the *z* is due to PIE *s*-epenthesis: 3rd sg. **h₁éd-ti/* → **[h₁és-ti]*, whence Hitt. *ezzazzi* /*éts-tsi/*. In both Hittite and Luvian the stem *ezz-/azz-* spreads beyond its original locus before endings beginning with *-t*.

⁴⁰ The CLuv. verb *ašša-* (*DLL* 33) does not exist: these forms belong to *ašša-* 'mouth' (see Laroche, *RHA* 23 (1965) 45). The equation of HLuv. *IRA-(sa)las/za-* 'be angry' with Hitt. *harsallant-* 'angry' is now dubious, in view of the spelling *IRA(-)za-sa-li-sá* 'angry' at MEHARDE B 4-5 (see Hawkins, *Florilegium Anatolicum* 152).

there is no good evidence for loss of voiceless *k in Luvian (1.2). The equation of Luvian *-s(s)a-* with Hittite *-ške-* is thus without foundation. Since Tocharian assures us that there is an **-s-* suffix parallel to **-ške/o-*, it seems more reasonable to equate Luvian iterative *-s(s)-* with Hittite *-šš-* (and Tocharian 'causative' *-s-*). I repeat that the only solid equivalent of Hittite *-š(s)-* in Luvian is *-s(s)-*: e.g. HLuv./CLuv. *as-/aš-'be' ~* Hitt. *eš-/aš*, HLuv. *has(a)-'beget' ~* Hitt. *haš(š)-*, HLuv./CLuv. *šwəa-/šwəa-'fill' ~* Hitt. *šwəa-*, CLuv. *šarri 'above, upon' ~* Hitt. *šer*, CLuv. *kašš-'cut' ~* Hitt. *kašš-*, etc.

We have already seen independent evidence for *k > Luv. z. This means that the iterative suffix **-ške/o-* would in the first instance lead to Luv. **-sza-*. That the awkward cluster *-sz-* might be simplified to *-z-*, giving attested *-za-*, seems likely, given such a simplification in Hittite. Eichner, *MSS* 31 (1973) 88, cites *takēizzi* (1x for *takēišzi* 'wields, renders'), *āzzi* (1x for *ar(a)šzi* 'flows'), and (*āppa*) *parza* beside *par(a)šza* 'backwards'. In the verb forms the simplification *sz > z* is usually blocked/undone by the pressure of the rest of the paradigm. In the case of the isolated adverb *par(š)za*, the simplification is normal, and the original form *paršza* is rare. In the Luvian iteratives, where the sequence **-sz-* ran throughout the paradigm, there would likewise have been no model for restoring *-sz- < -z-*.

The apparent equation of HLuv. *aza-* 'love' with Hitt. *aššiya-* 'be beloved' (*HHL* 182), which contradicts the weight of evidence for Luv. *-s(s)- =* Hitt. *-š(š)-*, may also be accounted for by a change **-sz- > -z-*. If we assume that the base verb was athematic (as suggested by Hitt. *ašš-* (middle) 'be pleasing'), then the iterative would have been **as-ške-*, whence HLuv. **asza-* and by cluster reduction *aza-*. The attestation of *aza-* as the first or second member of personal names suggests that *aza-* is synchronically an ordinary verb, not an iterative. This is entirely compatible with the proposed derivation from **as-ške-*, however. Compare Hitt. *duške-* 'rejoice' < **tus-ške-*, synchronically an ordinary verb capable of forming its own iterative *duškiške-*. Likewise Hitt. *iške-*, *paške-* and *huške-* undoubtedly reflect old iterative stems: see Oettinger, *Stammbildung* 326.

HLuvian *aza-* 'love' as well as all other Luvian stems in *-za-* may thus be interpreted as iteratives in origin. Given the Luvian pair of iterative suffixes *-s(s)a-/za-* beside Hittite *-šša-/ške-*, the equation *-za- = -ške-* imposes itself. The derivation of *-za-* from **-ške/o-* via **-sza-* is also phonologically plausible in view of other examples for *k > Luv. z and the Hittite evidence for *sz > z*. Since iterative *-za-* is functionally

parallel to *-s(s)a-*, the unexpected *hi-*conjugation of *-za-* verbs (3rd sg. *-zai* vs. Hitt. *-šizzi*) may be analogical after those in *-ša-*, where *hi-*conjugation is old (cf. Hitt. *iššai* 'makes').

2.3.6 CLuv./HLuv. *-iz(z)a-* < **-i(s)keo-(?)*

The examples offered above in 2.3.1–2.3.5 for PIE *k > Luv. z also suggest a possible (!) source for the Luvian secondary suffix *-iza-* cited in 2.3.1. Recall that *-iza-* forms 'ethnic' adjectives (URU *Taurišzaza-* < URU *Taurišā*) and HLuv. *nimwizaza-* 'child, son', which may be interpreted either as an adjective of appurtenance or as a diminutive, depending on whether one interprets the base **nimwəa-* as 'lack of strength' or '(one) having no strength'. All these functions are attested for PIE **-(i)ko-*: cf. Grk. *Ἀχαιῶκος* 'Achaean' < *πιῖτα-*. As the Skt. example 'equine' < *ἵππος*, Skt. *पुत्रक-* 'little son' < *पुत्र-*. As the Skt. example shows, this suffix (especially in the form **-iko-* with *-i-*) regularly continues a PIE velar *k. However, a secondary suffix **-ko-* with similar function is also old: cf. Skt. *युवाśās* = Lat. *iuuencus* 'young (of animals)'. As Brugmann, *Gr.* 2/1.238, points out, it is possible that various examples from centum languages conventionally ascribed to **-ko-* may continue **-ko-* instead. A PIE **-iko-* is therefore conceivable. Note that Palaic shows a secondary suffix *-ik-* or *-ika-* (*ḍGulzannikeš* < **gulzann-* to **gulzatar*): see Carruba, *StBoT* 10.61, and Melchert, *KZ* 97.37.

J.Jasanoff has reminded me that the simplification **-sz- > -z-* suggested for the iterative suffix in 2.3.5 opens another possibility for *-iza-*, namely equation with Germanic **-iska-* (Goth. *barn-isks* 'child-like' < *barn*, Germ. *-isch*, Eng. *-ish*). Since the Balto-Slavic forms (Lith. *-iška-*, OCS *-iskŭ*) may be borrowed from Germanic (see Brugmann, *Gr.* 2/1.261), and more positively Vaillant, *Gr. comp.* 2.682), the quality of the velar is indeterminate: an **-isko-* is quite possible. As Brugmann notes, the origin of the suffix is obscure. While the isolation of the suffix in Anatolian gives pause (Luv. *-iza-* < **-isko-* would preclude connection with Pal. *-ik(a)-*), one should recall that a suffix as widespread as PIE primary **-to-* is scarcely represented in Anatolian (perhaps in Pal. *tarta-* 'curse(d)' and indirectly in Hitt. *šaktā(i)-* 'perform sick-maintenance').

2.3.7 Luv. *zu* < PIE **kew*

Having seen evidence for PIE *k > Luv. z, we may now return to the famous cases of alleged *k > š/s: HLuv. *asu(wa)-* 'horse', *šwəa-na/i-* 'dog', *šurmi* 'horns'. As discussed above in 1.1, these three words

are written with HLuv. sign 448, read by Gelb as *śu*. Laroche, *HH* 231, reads *śu* (?), but stresses that the nature of the consonant is uncertain, since the sign occurs only in the words given and a few names for which cuneiform equivalents have not been found. Hawkins, *AnSt* 25 (1975) 154, still reads *śu*. Evidence for the reading with *s* is weak. There is the place name *Sura* (CARCHEMISH A 15b, 4 *śu* + *ra/i-wa/i-ni-ti* (URBS), i.e. /surawanti/, abl. of *surawanni*- 'of Sura'). This recalls the ethnic name in CARCHEMISH A 6, 2-3: *śu* + *ra/i-za-ha* (URBS), i.e. /suraza/, dat. pl. 'the Sura' (NB *śu*, sign 320). However, the contexts of the two occurrences are rather different: *surawanni*- occurs together with Assyria and Taiman (?), while *suraza* is grouped with *musaza* (Lydians?) and *mus(a)kaza* (Phrygians?). Note further that *surawanni*- presupposes a noun base *śura*- (a city), while *śuraza* is an adjective naming a people. Equation of the two is thus far from assured.

J. Wills has kindly called my attention to the recent equation of HLuv. (DEUS) *á-la-śu-wa/i-sa* with cuneiform *Al-la-an-zu*- (see Hawkins, *AnSt* 31 (1981) 172 with references). As Hawkins indicates, this equation is buttressed by the fact that the goddess *Allanzu* in Hittite typically accompanies *Sarruma*, while both instances of *Alasuwās* in HLuvian immediately follow *Sarruma* as well. This distribution can hardly be accidental. While Hawkins makes no comment on the HLuvian spelling, the equation *Alasuwā*- = *Allanzu* clearly argues that sign 448 should be read not *śu*, but *śu*.⁴¹ We should then read HLuv. *azu* (*wa*)- 'horse', *zūwana/i*- 'dog', and *zūmi* 'horns', with the same change of **k* > Luv. *z* as seen in the examples above in 2.3.1-2.3.6.

2.4 Lycian *s* < PIE **k* (?)

We have just seen that HLuv. 'horse' should be read *azu*(*wa*)- with *z* vs. *śu* *aśśaśšanni*- 'stable-master' (or similar) in the Hittite horse-training texts with -*śš*- in a borrowing from Indic (Skt. *aśva*- 'horse'). This difference and the other evidence presented for Luv. *z* < PIE **k* argue that HLuv. *azu*(*wa*)- is inherited, not borrowed. This makes it less likely that Lyc. *esbe* 'horse' is borrowed either.

Neumann, *Weiterleben* 52 and *HbOr* 394, concedes that Lyc. *śnta* is a number, probably a decad, but argues against the interpretation 'hundred' on the basis that other decads also end in -*ta*: *aitāta*, *nuntāta* (perhaps 'eighty', 'ninety'). On the other hand, the fact that *śnta* may be

⁴¹ I read *śu* because *zu* is already reserved for sign 432: see Laroche, *HH* 223, and Hawkins, *AnSt* 25.155.

compounded with *kbi* 'two' (*kbiśnta*) seems to argue for a meaning 'hundred' and derivation from **kmtóm*.

The Lycian word *śiyēni* occurs immediately after *ebeli* 'here', and in a tomb inscription the interpretation 'lie(s)' (*hic iacet*) immediately comes to mind. However, the ending -*ēni* raises difficulties. Pedersen's comparison, *LH* 17 f., with the Hittite 'durative' suffix -*anni*- (*iyanni/a-ma*' etc.) cannot account for the apparent occurrence of *śiyāni* with *amu* 'I' (see Gusmani, *IF* 67 (1962) 162, with n. 12). Gusmani suggests a participle; and in principle one could assume a participle in -*ēni*- comparable to Germanic *-*ana*- < *-*ono*-, but there is no evidence to support such a participle type in Anatolian.

In sum, Lyc. *esbe*, *śnta* and *śiyēni* suggest, but do not now prove, a change PIE **k* > Lyc. *s* (via Common Luvian **z*).

3. Conclusion

The evidence presented above for PIE **k* > Luv. *z* may at present be interpreted in two ways. First, in the absence of any (!) examples of PIE **k* > Luv. *k*, one could assume an unconditioned change PIE **k* > Luv. *z* (> Lyc. *s*?), **k* > Luv. *k*, **k** > Luv. *k*u (/k*/ or /kw/). I stress again that there is evidence for all three of these changes before front vowels: **keyo*- > *ziya*- 'lie' (> Lyc. *siye*-?) etc., **kes*- > *kišā*(*i*)- 'comb', **k**i- > *kui*- 'who, which'. I readily concede, however, that the assumption that in all of Indo-European only the Luvian languages preserved unconditionally such a three-way distinction is inherently suspect.

For those who find such an idea unacceptable, present evidence permits an alternative. Leaving aside the derivation of Luv. -*iza*- from *-*i*(*s*)*k*o-, which is very speculative, all other examples of Luv. *z* < PIE **k* involve paradigms where a front vowel, **y* or **u*/*w* is present in all or some forms: *za/i*- 'this' < **k*o-/*k*i-, *ziya*- 'lie' < **keyo*-, *zār*(-*za*) 'heart' < **kēr*, *wazi*(*ya*)- 'demand, ask for' < **wek*-*ye*-, *za*-(*iter*.) < **sk*e/*o*-, plus *azu*(*wa*)-, *zūwana/i*- and *zūmi*. One could therefore suppose a conditioned split of PIE **k*: **k* > Luv. *z* before front vowel, **y*, and **u*/*w*, **k* > Luv. *k* elsewhere. The consistent *z* in the attested paradigms above would be due to leveling, while the absence of Luv. *k* < PIE **k* would be due to chance. If one makes the ad hoc but not refutable assumption that **kmtóm* becomes Lyc. *śnta* via a stage **kintal*/*kenta* (or even **kunta*), the Lycian examples of **k* > *s* are also com-

patible with the above conditioning. Including $*u/w$ as a palatalizing environment is not a problem: cf. the Armenian treatment of velars and labiovelars as palatals after $*u$ (e.g. *dustr* 'daughter' < **dhu_hter-*) and see the remarks of Solta, *IF* 70 (1965) 278 ff. I stress again, however, that even by this second scenario Luvian shows a three-way contrast of velars before front vowels.

I will not attempt to pursue here the implications of the Luvian facts for the vexing problem of centum/satem and two vs. three sets of velars in PIE. It is obvious that by the strict tenets of the comparative method Luvian requires reconstructing three sets of velars for PIE, supporting evidence from Albanian and Armenian for such a distinction (see for Albanian Pedersen, *KZ* 36 (1900) 277 ff., and Jokl, *Mél. Pedersen* (1937) 127 ff.; for Armenian Pisani, *Ric. Ling.* 1 (1950) 165 ff.). However, more than one scholar has suggested that this is not the only (or necessarily the right) way to view the problem: see among many Allen, *TPS* (1978) 87 ff., and Shields, *KZ* 95 (1981) 203 ff.

In conclusion, I wish to stress one point regarding centum/satem in Anatolian. By the first interpretation above, Luvian (CLuvian, HLuvian, Lycian) is neither centum nor satem, since it would show neither a merger $*k_1, k_2 > k$ nor $*k_1, k_2 > k_3$ but a three-way contrast. By the second interpretation Luvian would show a conditioned merger of $*k_1, k_2 > k_3$, while $*k_2$ is kept distinct. In that case Luvian would clearly be a centum language, one where the merger of $*k_1$ and $*k_2$ was conditioned rather than complete, just as Albanian and Armenian are clearly satem languages, albeit where the merger of $*k_1$ and $*k_2$ is conditioned. By either interpretation the change of PIE $*k_1$ to Luv. z has nothing whatever to do with the dialect development designated 'satem'.

Postscript: the first draft of this article was completed away from Chapel Hill. Upon my return, I turned to an unpublished manuscript (ca. 1970-72) on Anatolian historical phonology which Warren Cowgill, with characteristic generosity, had made available to me, in order to see what he had written on the subject of PIE velars in Anatolian. In point of fact, working with considerably less evidence than is now available, Professor Cowgill had already tentatively concluded that the Luvian subgroup shows the three-way treatment of voiceless velars claimed here (his formulation was that of an unconditioned three-way contrast). It seems particularly fitting that these few lines supporting his analysis appear in a volume dedicated to his memory.

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