Rhotic degemination in Sanskrit and the etymology of Vedic ārū- ‘thigh’, Hittite UZU(u)walla- ‘id.’

Alexander Nikolaev | ORCID: 0000-0002-2138-810X
Boston University, Boston, MA, USA
alexander.s.nikolaev@gmail.com

Abstract

This paper examines the absence of geminate -rr- in Sanskrit and argues that the synchronic ban on this sequence results from continued high ranking of an Obligatory Contour Principle constraint against heteromorphemic geminates (inherited from PIE) combined with the substrate influence of Dravidian languages in which the rhotics are non-geminable. New -rr- sequences that arose in Proto-Indo-Iranian and Proto-Indo-Aryan from PIE *-LL- or *-LHL- after loss of the laryngeal and merger of *l with the rhotic were repaired through degemination. This hypothesis predicts a development of PIE *(-)C̥LHLV- to Sanskrit (-)Cī/ūrV- which has not been previously recognized in the treatments of Indic historical phonology. This development is arguably found in mūrā- ‘stupid’ < *mūrra- < *mr̥h-La- (cf. Hitt. marlant- ‘stupid’), ārū- ‘thigh’ < *yūrru- < *(h_x)u̯l̥h-x-Lu- (cf. Hitt. walla- ‘thigh’), śīrá- ‘fervent’ < *sīrrā- < *k̑l̥h-Ló- (cf. śrā́ya- ‘be fervent’), and perhaps in several other examples.

Keywords

Sanskrit historical phonology – Indo-Iranian – Anatolian – Latin – Proto-Indo-European reconstruction – laryngeal loss – Saussure Effect – long syllabic resonants – rhotics – language contact – etymology
There is no geminate r in Sanskrit from its earliest attestation onwards. In cases where a sequence -rr- is expected in external sandhi or in composition, the first r is eliminated with a compensatory lengthening of the preceding vowel, if the latter is short (Pāṇ. 6.3.111; R̥k-Prātiśākhya 4.29). The rule applies both to underlying r and to r < s in Ruki context:

(1) r-Deletion

/antaɻ + ɻodasiː/ > [antaː ɻodasiː] ‘between two world-halves’
/punaɻ + ɻuːpaːɳi/ > [punaː ɻuːpaːɳi] ‘again forms’
/matuɻ + ɻiɦant/ > [maːtuː ɻiɦan] ‘mother’s licking’
/duɻ + ɻoɦaɳan/ > [duːɻoɦaɳan] ‘difficult mounting’

1 C is used as a cover symbol for any consonant, L is used as a cover symbol for *r and *l, while U stands for *i and *u; “→” is used for morphological derivation, while “>” denotes phonological development; TP = transponate. For Sanskrit data, this article employs standard Indological transliteration which can be easily converted to the IPA: macrons designate vowel length [], ring below a symbol indicates syllabicity ([]), dot underneath a symbol indicates retroflex articulation (t = [ʈ], n = [ɳ], etc.), bh, dh, gh, etc. are aspirated plosives ([bɦ], [dɦ], [gɦ], etc.), j = [ɟ], s = [ʂ], ś = [ɕ], h = [ɦ]; the articulation of the Sanskrit rhotic is debated (see the discussion in the main text below): the widely agreed-upon phonetic interpretation of /r/ is [ɻ] which is used in transcriptions below. Vedic texts are abbreviated after Gōto (1987); Greek texts are abbreviated after LSJ; Latin texts are abbreviated after OLD.

2 One apparent exception is the compound vārrāśi- (m.) ‘ocean’ (scil., ‘water-heap’) cited by Rāja Rādhākānta Deva 1825–1857/4: 353, allegedly from a Purāṇa; I have not been able to confirm the form and it is unlikely to be genuine.

3 See Whitney (1889: 61); AiGr 1.335; Macdonell (1910: 72); Bloch (1951: 44); Renou (1952: 101); Allen (1972: 70); Kavitskaya (2011: 91–92).

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Another remarkable fact is that /r/ is the only sound expressly excluded by Pāṇini (8.4.46–52) from the list of Sanskrit consonants that may be doubled in clusters. The sequence -rr- is thus prohibited in Sanskrit both in derived contexts and morpheme-internally.

Sanskrit is not typologically unique in this regard: for instance, in the Romanesco dialect of Italian the rhotic is the only consonant excluded from gemination in external sandhi (raddoppiamento sintattico). The same restriction is observed in Tamil, Malayalam, and other Dravidian languages where all consonants may be geminated (for instance, in the formation of causative stems), except for /r/, /l/, and /l/. This situation is reconstructed for Proto-Dravidian; its potential significance for the question of non-geminability of the rhotic in Sanskrit is obvious, since Dravidian languages exerted considerable contact influence on Indo-Aryan. There are other languages in which geminate consonants are generally permitted, but rhotics are joined by some other consonants in being non-geminable.

The phonetic basis of the ban on geminate rr in Sanskrit is difficult to determine with certainty, since we do not know how exactly Sanskrit /r/ was articulated: Indian grammatical tradition variously describes it as dental (dantya),

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8 Optional gemination of the second consonant in a cluster is taught by Indian grammarians and supported by ample manuscript and inscriptive evidence, e.g., brahmā > brahma ‘Brahman’, apa hnite > apa hnnute ‘denies’, or adya > addya ‘today’, see Cardona (2013: 51–64).

9 Unsurprisingly, the sequence is not found in internal sandhi either. There is only one set of r-initial endings in the language, namely, 3 pl. -re / -rate, -ran / -ram and ipv. -ram, but there are no such forms in Vedic made from roots ending in -r: for instance, the root śṝ- ‘to smash’ makes aor. pass. (a)śāri, but in the plural the verbal adjective has to be used instead, as in RV 1.174.6 tvāyā śārtāḥ ‘they were shattered by you’, not tvāyā ṭaśṝjan (where, admittedly, the cluster would have been -rr- and not -rr-). Middle perfects made from roots in final -r invariably use connecting -i- before 3 pl. ending: dadhiri, śir̄i, caκkiri, etc.

Sasha Lubotsky points out to me that cases of distant dissimilation of r…r, e.g., intens. *ār̥- (root ṭ-) > ṭār̥- ‘be on the rise’ (AiGr 1.221) or *durhṝṇā- ‘rage’ (root hṝ-) > dhr̥nā (Narten 1982: 149) may be related to the phenomenon under discussion.

In modern Romanesco rhotic degemination is a sociolinguistic marker, see Nodari & Meluzzi (2020).

10 For (literary) Tamil see Lehmann (1994: 11); for Malayalam see Mohanan & Mohanan (1984: 581–582) and Sadanandan (1999: 22–23).

11 See Steever (1998: 16); Andronov (2003: 300); Krishnamurti (2003: 152).

12 See, e.g., Hock & Bashir (2016: 256–259).

13 For instance, Biblical Hebrew where pharyngeal and laryngeal fricatives are non-geminable along with the rhotic (Blau 2010: 81–82), Wolof where geminate obstruents, laterals, and glides are permitted, but not rhotics or voiceless continuants (Ngom 2003: 8), or Pulaar where beside [r] voiceless continuants [s], [f], and [h] cannot be geminated (Niang 1997: 48).
alveolar (dantamūlīya ‘tooth-rootic’), or retroflex (mūrdhanya ‘cerebral’). However, evidence across languages suggests that rhotics of all types are marked as geminates. Podesva (2000) proposed a perceptual account of the constraint on geminate sonorants in general arguing that they are easily confused with corresponding singletons due to their relative acoustic similarity to flanking vowels. This hypothesis is supported with experimental evidence showing that intervocalic geminate sonorants are spectrally continuous with adjacent vowels making their constriction duration difficult to perceive.

This paper is devoted to the diachronic aspect of the problem: how did the *GemRhotic constraint come about in Sanskrit? To start at the very beginning, we know that there was no *-rr- in Proto-Indo-European where heteromorphemic geminates were not allowed. For instance, as Jochem Schindler observed, there are no adjective stems in *-ro- made from roots in final *-r: PIE speakers apparently avoided the derivation that would lead to a dispreferred structure. We can therefore theorize that Proto-Indo-Iranian inherited from PIE an Obligatory Contour Principle constraint against adjacent identical segments: heteromorphemic geminates continued being avoided in derivation and were repaired through deletion when unavoidable. The continued high ranking of this constraint in Indo-Aryan conspired with the nongeminability of rhotics in Dravidian substratum resulting in the restriction on geminate -rr- throughout the history of Sanskrit.

Let us explore the predictions of this hypothesis in more detail. While it is certain that Proto-Indo-Iranian did not inherit any geminate liquids going back to PIE *-rr- or *-ll-, since these sequences were avoided in the proto-language, it seems that in PIE *-rl- or *-lr- were possible clusters: individual IE languages either show no restriction on these sequences (cf. Luw. hūṭarānī- ‘(little)
slave’, Pal. warlaḫi- ‘lamb’,23 or Lith. gurlis ‘weak’) or eliminate them through assimilation or epenthesis in front of our eyes, as it were (cf. Lyd. serli- / selli- ‘authority’ ((s) = [ʃ]), OIr. sell ‘eye, iris of the eye, glance’ < *stillo- < PCelt. *stirlo-,24 Toch. A ārāl ‘end’, perl. ārlā (< *āralæ with epenthesis < TP-h-r-lo-, root ār- ‘to cease’),25 or Arm. molar ‘erroneous’ (< *mol-ro-26). Given that PIE *r and *l merged in Sanskrit,27 can we tell what happened to PIE *-rl- and *-lr- by reconstructing forward?

A hypothetical PIE form *Cer-lo- would be expected to give Proto-Indo-Iranian *Carra-; the hypothesis that a constraint against geminates in PIE was inherited in Indo-Iranian predicts that *Carra- would be degeminated, either to *Cara- or to *Cāra- with a compensatory lengthening. The latter assumption is borne out by the synchronic facts of Vedic sandhi (pūnar rūpāṇi > pūnā rūpāṇi), even though in theory there could be differences between word-internal cases of /VrrV/ versus the treatment of /Vr#r/ in external sandhi or composition. Unfortunately, the development *Cer-lo- > Cara- (or Cāra- with compensatory lengthening) can be neither confirmed nor denied: a Sanskrit word of the structure Cāra- going back to a PIE root *CeL- cannot be shown to go back to *Ce/oL1-L2-o- (e.g., *Cer-lo-) rather than *CoL-o- (with Brugmann’s Law) or *ČE Ł-o- unless there is a word equation with a liquid suffix in another Indo-European language, for which I have not been able to find a fully convincing example.28 Non liquet.29

23 See Sasseville & Yakubovich (2018 [2021]: 51).
24 See Schrijver (1995: 421). Lat. stella ‘star’ is inconclusive since it may go back to *stērelæ- with syncope.
25 On Tocharian gerundives, see Fellner (2017).
26 For vowel epenthesis, see Olsen (1999: 338); the PIE root is *mel- (OIr. mell₂ ‘confusion, error, undoing’ (< *mel-so-), Gk. Ion. μέλεος ‘idle, vain, futile’ (< *meleho-), perhaps zero-grade *ml̥s- in βλάς(-φημος)).
27 Space limitations prohibit discussing the question of possible preservation of PIE *l in Indo-Iranian, and I am going to proceed on the admittedly simplified assumption that PIE *l > Proto-Indo-Aryan *r at least in those dialects of Indo-Aryan which underlie the texts from which the examples discussed in this paper have been drawn. For a recent discussion of PIE *l in Indo-Aryan, see Schoubben (2019).
28 Ved. dhārā- ‘blade, cutting edge’ (YAv. dārā- ‘id.’, Ch. Sogd. d’r) has been explained as a metonymical extension of *dʰərə- ‘gush, pouring, casting (of liquid metal)’ (EWAia 1.789, root dhani), which is not entirely satisfactory on the semantic side. A possible direct comparator may be found in Gmc. *darr-ːn ‘spear’, ON darr for which Schaffner (2001: 124–125) posited a preform TPdʰor-Ló- and proposed an etymological connection with IE *dʰer- ‘to hold (a weapon in hand)’. But under this root etymology Ved. dhārā- can be just as well accounted for as a reflex of *dʰər-eh₂- or *dʰer-eh₂- (rather than *dʰer-leh₂-), while Gmc. *darr-ːn may also be analyzed as an outcome of *dʰor-s-ːn.
29 Since it is unclear whether Proto-Indo-Iranian *Carra- became *Cara- or *Cāra- with compensatory lengthening, I am going to employ a compromise notation *Cār-..
There is another, more promising question that can be investigated under the hypothesis of a continued high ranking of an OCP constraint against geminates in Indo-Iranian: what happened to new *-rr- sequences arising from PIE *-LHL- after application of various laryngeal-loss rules, such as the Saussure Effect or the creation of "long vocalic resonants"? For instance, there is no reason to doubt on phonological grounds that *CVLh₁-Lo- could be a valid PIE formation: cf. *g̑helh₂-ro > OIr. galar (n., -o-) 'sickness, disease', Hitt. kallar(a) - 'unfavorable, baleful'. An o-grade *CoLhₙ-Lo- would be subject to the Saussure Effect and become *Col-Lo- already in PIE.\(^{30}\) If the liquids were identical (e.g., *Corh₁-ro > *Cor-ro-), we would expect the resulting sequence of two heteromorphemic resonants to be degeminated already in PIE: cf. *(s) tômₙh₁-mn > 'a cut, opening' > *(s) tômnmn > *(s) tômny > Gk. στόμα 'mouth', Hitt. štamən- 'ear'.\(^{31}\) If the liquids were different (e.g., *Corh₁-lo-), the resulting form *Cor-lo- would develop into Proto-Indo-Iranian *Car-ra- after the merger of *l and *r. Since we never find forms with geminate rr in Indo-Aryan or Iranian,\(^{32}\) it is not unreasonable to speculate that *Carra- in our exempli gratia reconstruction would be repaired as *Cāra- since it violated the constraint against geminates. Unfortunately, this development cannot be demonstrated due to the same problem as above: a hypothetical Sanskrit or Avestan form *Cāra- from PIE root *CeLh₁- can always be explained as a plain thematic derivative, rather than a reflex of *CoL₁hₙ₂₁₀-, unless the liquid suffix is supported by comparative evidence.\(^{33}\) Another non liquet.

\(^{30}\) While I assume a PIE date of the Saussure Effect, this sound change has been contested by some scholars (Pronk 2011; van Beek 2011).

\(^{31}\) This analysis was proposed by Neri (2005: 212-49); see also Vine (2019: 229).

\(^{32}\) There are no geminate consonants in Old Iranian (Kümmel 2014: 208 & 210-21). Finding evidence for the purported development *CoLh₁-LV- > *Col-LV- > *Car-rV->
But the thought experiment may continue: another valid PIE formation containing a sequence of two liquids separated by a laryngeal is \( *C_h\cdot L\cdot - \).\(^{34}\) The expected development of this sequence on the way to Sanskrit is as follows:

\[(2) \quad \text{PIE } *C_h\cdot L\cdot - \]  
\[
\begin{align*}
\text{Proto-Indo-Iranian} & \quad *C_hL\cdot H\cdot - \quad \text{(merger of } /e/, /o/, \text{ and } /a/ \text{ as } /a/) \\
\text{Proto-Indo-Iranian} & \quad *C_hL\cdot H\cdot - \quad \text{(merger of } /h_1/, /h_2/, \text{ and } /h_2/ \text{ as } /H/) \\
\text{Proto-Indo-Iranian} & \quad *C_eL\cdot H\cdot - \quad \text{(epenthesis}\(^{36}\)) \\
\text{Proto-Indo-Aryan} & \quad *Ci/\cdot urH\cdot r\cdot - \quad \text{(} \partial > i; \text{ rounding in a labial context}\(^{38}\)) \\
\text{Proto-Indo-Aryan} & \quad *Ci/\cdot ürra\cdot - \quad \text{(loss of } H \text{ with compensatory lengthening)}
\end{align*}
\]

However, we never find forms like \( *Ci/\cdot ürra\cdot - \) in Sanskrit. Just as above, it is possible to theorize that the continued high ranking of an OCP constraint against geminates (inherited from PIE) necessitated the repair of disallowed \( *Ci/\cdot ürra\cdot - \) as \( *Ci/\cdot üra\cdot - \), except that in this case degemination would be of Proto-Indo-Aryan date: in the sequence \( C_hR\cdot H\cdot C\) the laryngeal was lost after Indo-Aryan separated from Iranian.\(^{39}\) Importantly, in this case there may be actual evidence to support the claim that the lautgesetzlich outcome of PIE sequence \( *C_h\cdot L\cdot - \) in Sanskrit was in fact \( *Ci/\cdot üra\cdot - \). Prior to discussing this evidence in the next section of the paper, I summarize my series of hypotheses in the table below, using \( lo\)- and \( ro\)-derivatives from roots \( *Cer\cdot - \) and \( Cerh\cdot C\) for illustrative purposes:

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34 Cf. Gk. \( χλωρός \) ‘pale green, yellow-ish’ \(< TP̑ g̑ h₃-\cdot rō\)- or Lat. \( malleus \) ‘hammer’ derived from \( *mala\cdot lo\)- \(< TP\cdot ml̥h₂\cdot lo\>- \( \text{both transponates are unfortunately uncertain since suffixal } *\cdot ero\cdot l\)- \( *\cdot elo\)- remains a possibility to be reckoned with).  
35 The first four sound changes are not critically ordered in respect to one another.  
36 See Cantera (2017: 489); Clayton (2018).
37 See n. 27 above.
38 For the phonological development \( *C_h\cdot C\cdot > *Ci/\· ürC\cdot , \) cf. \( türnā\) ‘one who has crossed’ \( (< *trh₂\cdot nō\>- \) or \( gürtī\) ‘praise’ \( (< *g̑ ṭh₂\· tī\>- \)) \( \) see Pinauld (1987–1988: 329); Clayton (2018).  
39 This is established on the basis of differing reflexes in Indo-Aryan and Iranian, cf. Ved. \( gūrbhīḥ \) ‘with songs’ vs. Av. \( garbāīś \) or Ved. \( stūרnā\) ‘spread’ vs. Av. \( starəta\).
(3) *rr*-Degemination from PIE to Sanskrit

|                | CVL₁⁵₂V | CoL₁₁₅₂V | CoL₁₁₅₁V | CLh₁LV |
|----------------|---------|----------|----------|--------|
| PIE            | *Cer-lo-| *Corh-Lo-| *Corh-ro-| *Crh-lo-|
|                |         | > *Cor-lo-| > *Cor-ro-|        |
|                |         | (Saussure Effect) | (Saussure Effect) |        |
| Proto-Indo-Iranian | *Car-ra- | *Car-ra- | *Cāra- | *CorH-ra-|
|                |         | > *Cara?- *Cāra?- | | (degemination) |
|                |         | (degemination) | | (Brugmann's Law) |
| Proto-Indo-Aryan | *Cāra- | *Cāra- | *Cāra- | *Ci/urH-ra-|
|                | | (no examples) | (no examples) | > *Ci/ūra-|
|                | | | | (degemination) |

2 PIE *-CLh₁LV- > Skt. *-Ci/ūrV-

Are there any specific examples that could be cited in support of the development of PIE *-CLh₁LV- to Sanskrit *Ci/ūra-? One way to find such evidence is to examine the instances of prevocalic -īL- / -ūL- in Sanskrit. Some of these cases represent analogical transfers of zero-grade root allomorphs from preconsonantal contexts, e.g., AV pūraya-⁴⁰, Br. pūraṇa- ‘filling’ where pūr- was extracted from pass. pūryate and p.p.p. pūrna-⁴⁰ or Ved. tīrā- ‘shore, bank’ which probably owes the root allomorph tīr- to tīrthā- ‘fort’.⁴¹ Other instances contain zero-grades of roots in *-ihx and *-uhx, e.g., vīrā- ‘man’ (*u₁h₁x-ro-) or dūrā- ‘far’ (< *duh₂-ró-), or may reflect laryngeal lengthening across compound boundary, e.g., sūrī- ‘patron of sacrifice’ if from *h₁su-h₂rí- ‘doté de la bonne rétribution’.⁴² There are words in -īra- whose -ī- in all likelihood represents a sec-

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⁴⁰ See AiGr 2.2: 26–27 and for details Leumann (1940: 225 = 1959: 318) and Jamison (1983: 149).
⁴¹ See AiGr 1.27; Zehnder (2007–2008: 197–198). Paul Thieme (apud KEWA 1.506) suggested that tīrā- may be explained as an outcome of *tṛ-ro-, viz., *tṛh₂-Lo- in modern notation (cf. Lat. trāns ‘across’, Hitt. tarḫu- ‘prevail’ for the laryngeal). But morphological details are uncertain and the reconstruction of the liquid suffix is not otherwise supported.
⁴² See Pinault (1999–2000: 427–441).
As Jamison (1988) demonstrated, in Indo-Aryan an interconsonantal laryngeal was “vocalized” as i only in the final syllable; see also Lipp (2009: 2389–398) with ample references and more recently Kümmel (2016). The i in nominal stems like gabhīrā- ‘deep’ or sārārā- (n.) ‘body’ cannot therefore represent a regular development of root-final *h₁ before the suffix -ra-. In the case of adjectives gabhīrā- and sāvīra- ‘powerful’, one may surmise that presuffixal i was transferred from comparatives *gā(m)bhiyāms- and *sāvīyāms- where it would be expected (see Schindler (1986: 386–387) on the origin of the long i in comparative suffix and Jamison (1988) on the secondary spread of i in nominal and verbal categories). For gabhīrā- specifically, Stephanie Jamison suggests (apud Nikolaev forthcoming) that lexical analogy to the rhyming root grabh- (āgrabhīt, grā(b)hītar-; etc.) may have played a role. Nominal forms like sārārā- or pāvīrā- ‘a kind of a metal weapon’ (pāvīravrāv(m)nt-; RV+) remain problematic. Only a few words of this structure may be explained as ra-derivatives from i-stems; cf. āṇḍīra- ‘having testicles’ (Class. Skt.+); from aṇḍī- f. (AV+) ‘testicles’ (see AiGr 2.2: 461). Frisk (1934: 41–43) argued that some stems in -ira- may be analyzed as derived from cvi-forms and cited pīṇḍīra- ‘dry, juiceless’ (Lex.) next to pīṇḍa- ‘lump’, pīṇḍī kr- ‘make into a lump’; I am not persuaded by this hypothesis, but there is no room for a detailed discussion of it in this paper.

One such case is Ved. mūrā- ‘dull, stupid, imbecile’ (RV+). As Nussbaum (2015) showed, the PIE root *merhₜ- ‘to be slow’ spawned a number of thematic derivatives with the meaning ‘slow, retarded’, including OIr. mer ‘de-

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44 On the sources of Sanskrit-ī see Lüders (1923).

45 Contra Whitney (1885: 124), it is quite unlikely that Ved. mūrā- is a derivative from the root mūrch- ‘to coagulate’: while nominal formations mūrchā- (AVP+) and mūrkha- (TS+) indeed have the meaning ‘mentally stupefied, stupid’, it is usually assumed that this is a secondary semantic development possibly facilitated by the similarity with mūrā- (Lüders 1909: 194). The root mūrch- (for which aor. āmūrchat AVŚ 20.34.12 is the earliest form, with other forms coming from much later sources) is based on a reanalysis of present stem *mṛh₁/ske/o- (see EWAia 2.368). There are traces of non-extended root mṛ- in Indo-Aryan, e.g., mūrtā- ‘coagulated’ (AVP+), mūrti- (f.) ‘solid body’ (Br.+, but a plain thematic derivative with a zero grade in the root made from the root mṛ- could only have been *murā- (< *mṛh₁/o-, cf. ātār- from ṭh- ‘to cross’); for this morphological type see AiGr 2.2: 72–73 and for the phonological development cf. purā- ‘much, many’ < *pṛh₁-ū- or bhurā- ‘to move rapidly’ < *bhṛh₁-e/o-. Ultimately, mūrā- and mṛ- are probably related and go back to PIE *merh₁-; but mūrā- is not a shallow derivative of mṛ-.

46 Cf. OIr. maraid, -maír ‘to last, to remain’ and Lat. mora ‘delay’ (Schumacher 2004: 476). Ved. mṛ- and mūrch- discussed in n. 45 above probably continue the same root (‘to flow slowly’ > ‘to coagulate’).
mented' (< *merh₂-ó-),

47 Gk. (Ion.) μωρός ‘stupid’, obtuse, foolish’ (< *mōr(h₂)-ó-),

48 and Hitt. marlant- ‘stupid’, marlatar ‘stupidity’, marle(s)š- ‘become dumb’,

etc. Nussbaum demonstrated—to my mind, conclusively—that Hitt. *marla-

(< *mr̥h₂-lo-50) is a complete etymological match to Ved. mūrā- which would then go back to *mūr-ra- < *mr̥h₂-lo-.

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47 See Zair (2012: 136).
48 The comparison between Ved. mūrā- and Gk. μωρός goes back to the very beginnings of Indo-European studies (it was first proposed by Pictet (1856: 330), as far as I can tell), but the phonology has always been problematic. Normier (1977: 18226) theorized that Skt. mūrā- and Gk. μωρός both go back to *muh₂-ró-; this derivation was accepted by Ramussen (1989: 71) and Olsen (2009: 357), but the development of word-medial *-uh₂-s- to *-uā/o- in Greek (“laryngeal breaking”) remains controversial and Gk. εἰςμο- (< *dhuh₂-mó- ‘smoke’, Hitt. tuḫḫ-) remains an important counterexample. Nussbaum’s solution plausi-

bly reconciles the Greek form with the Vedic without taking recourse to either debated phonological apparatus (“laryngeal breaking”) or substrate influence (Pisani 1964: 117; I thank Massimo Poetto for the reference).
49 One wonders if Ved. malvā- ‘foolish’ (EWIA 2:334: “nicht überzeugend erklärt”) may go back to the same root (TPmor(h₂)-uō- > malvā- with dialectal l).
50 For a *-lo- adjective extended with -nt- in Hittite cf. maklant- ‘thin, slim’ next to maklatar ‘emaciation’.
51 YAv. mūra- ‘stupid’ may seem to present a problem for Nussbaum’s analysis, but in fact the problem is only apparent: even though the word looks like an exact correspondence of Ved. mūrā-, it is unlikely to be related to it. In principle, YAv. mūra- may continue either Proto-Iran. *mūrā- or Proto-Iran. *mūrā- (de Vaan 2003: 284–290). The theory that Vedic and Avestan forms are cognates going back to *mr̥h₂-lo- would require a development of unaccented *ḫH to ur in Iranian after a labial consonant which is not assured: normally interconsonantal *-H gives Iranian *-ar- and unaccented *-H- becomes *-ar- (Cantera 2017: 489). One possible example of unaccented *-H- > -ur- is YAv. uruai.āp- ‘whose waters spread wide’ (Yt. 8.46) analyzed by Cantera (2001: 44–45) as an outcome of *urvi̯- < *yurvi̯- < *yurvi̯- (cf. Ved. urvi̯- for *ūrvi̯), but on the one hand, this development may have been conditioned by y in the onset of the second syllable of *yurvi̯- and on the other hand, other explanations are available (Lubotsky 1997: 145–146).

However, Bartholomae’s translation of YAv. mūra- as ‘blödsinnig’ (1904; col. 1183; Pirart 2004: 322) is based solely on the word’s similarity with Ved. mūrā-: the Avestan word is attested in Yt. 5.93 in a list describing people with various physical defects who should not partake of Anahita’s libations, and the form mūrāsca follows andāsca ‘blind’, karānāsca ‘deaf’, and druusāsca ‘paralyzed’. The meaning ‘mute’ suggests itself, and the etymology presents itself virtually unbidden, cf. Ved. mūka- ‘dumb, mute’, Lat. mūtus’ id. from clearly onomatopoetic PIE *müh-. YAv. mūraka- may be a derivative of mūrā-, but its meaning is uncertain: dahakāsā mūrakāsā pouru sarōṣa varśnasā the dahakas, mūrakas, and varśnas of many kinds’ (Y. 11.6) refer to daevic creatures presented in the text as antithetical to priests, charioteers, and husbandmen, but even if nom. pl. mūrakāsca refers to a class of society, their precise identity is unknown (Josephson 1997: 11546). The word may just as well describe the monsters’ inability to speak. To conclude, YAv. mūra- ‘mute’ and mūraka- ‘?’ are in all likelihood unrelated to Ved. mūrā-.
I believe that another example of rhotic degemination may be found in Ved. ārú- (m.) ‘thigh, shank’ (RV+).52 There is no Indo-European etymology for this word: the search for a root *(h₃)u̯eh₂-ru- (> Ved. ārú-) could have been derived has not yielded a satisfactory result.53 The idea presented in this section is that the sequence ār- in this word results not from *(h₃)u̯eh₂- but from *(h₃)L̥h₂- in preconsonantal position54 created by another (suffixal) liquid which was subsequently eliminated after the loss of the laryngeal, as argued in (2) above: *(h₃)L₃h₂-Lu- > *(y)ūr-ru- > *(y)ūrū- > ārú-.55

3.1
Under the hypothesis that Ved. ārú- goes back to *(y)ūr-ru- with a simplification of geminate rr, the word may be analyzed as a derivative made from a root *(h₃)u̯erh₂- or *(h₃)u̯elh₂- with the suffix -ru-. This suffix is rare but not unknown in Vedic (cf. dhārú- ‘sucking’ ~ Gk. ἐλεύς, śátru- ‘enemy’, or bhīru- ‘fearful’)56 and its presence in the word for ‘thigh’ can be accounted for in two ways, either as a product of an established derivational mechanism or by analogy. In PIE, thematic adjectival stems were capable of producing u-stem abstracts by the model outlined by Nussbaum (1998: 527–528), e.g., *bʰeh₂-no- (OIr. bán ‘white’) : *bʰo/eh₂-nu- (Ved. bhānú-, Av. bānu- ‘lightbeam’) or *keh₂-lo- (Goth. hails ‘sound’, Welsh coel ‘trust, (good) omen’) : *(k)oh₂-i-lu- (Gk. κοῖλυ· τὸ καλόν).

52 See Forssman (1986) for a detailed overview of this word.

53 EWAia 1.2.42: “Eine überzeugende Deutung von ār aus iir. oder idg. Vorstufen scheint nicht vorzuliegen”; RIVELEX 2.430: ”Die Etymologie ist nicht gesichert”. Lidén’s comparison to Lat. vārus ‘bent outwards, bow-legged’ (1907: 262–264) is phonologically and morphologically possible (*(h₃)u̯eh₂-ro- > vārūs, *(h₃)u̯h₂-ru- > Ved. ārū-), but semantically unattractive; it was therefore not met with much approval (see the critical appraisal by Forssman (1986: 339); for Lat. vārus, de Vaan (2008: 655) starts with the original meaning ‘with the legs opened’ and derives it from the same PIE root *(h₁)u̯eh₂- as vānus ‘hollow’). Forssman himself suggested a lexical four-part analogy (bahú- ‘large’ : bāhú- ‘arm’ = ārú- ‘broad’ : X, where X is resolved as ārū- ‘thigh’), but his explanation did not carry conviction.

54 See n. 38 above for this phonological development. Prevocalic *(h₃)L₃h₂ in a labial context would have given ur with a short vowel, see the examples in n. 45 above.

55 The loss of initial v before ā is regular, cf. ārū- ‘wave’ < *(v)ūrm- (< *TʰyHmi-) or aor. mid. participle uranā- < *(v)urānā- (< *TʰyHmhi-, see AiGr 1.261–262. On the basis of metrical evidence Beguš (2015: 545–546) argued that the loss of v before the long high vowel ā preceded its loss before the short ā.

56 See AiGr 2.2: 86; Pinault (1997: 228); see also Schaffner (2001: 500) (on Germ. *χuŋɡru- ‘hunger’; differently Neri 2003: 289–303) and Garnier 2017 (on OIr. ul ‘beard’ < *(h₃)pu-lu-).
the same way, the derivational basis for substantive *(h₂)u̯Lhx-Lo- (> *yūr-ru-)
could have been provided by an adjectival stem *(h₂)u̯Lhx-Lu-. But it may in the
day be more economical to assume that *ūrā- ‘thigh’\(^{57}\) was remade to *ūru- by
lexical analogy to another u-stem word for a body part, namely, bāhū- ‘arm’.\(^{58}\)
Under this analysis we only need to posit one nominal stem, namely, *yūr-ra-
< *(h₂)u̯Lhx-Lo-.

3.2
Several Iranian cognates have been proposed for Ved. *ūrū-, but these proposals
are ultimately not compelling.

Werba (1986: 334–335\(^3\)) identified YAv. uru- as the second member of a
demon’s name Spītīura- (Yt. 19.46) and conjectured a form of this word in
Yt. 5.7. If the Avestan counterpart of Ved. *ūrū- were indeed uru-, it would be
problematical for the etymology of the Sanskrit word pursued in this paper: the
sequence *u̯LhxC- is normally reflected as var- or vər- in Avestan, probably
depending on the position of the accent;\(^{59}\) cf. *u̯r̥h₂̥ > YAv. varaz- ‘strength’,
vərəz- ‘strong’ (Ved. úrj- ‘nourishment, strengthening’), *h₂̥u̯Lhx₁n̥h₂ > YAv.
vərən̥- ‘wool’ (Ved. úṛn̥a-), or *u̯Lhx₁m₁ > YAv. varəmi- ‘wave’ (Ved. úrmɪ-).\(^{60}\)
The expected outcome of Proto-Indo-Iranian *(H)u̯rHru- in Avestan would there-
fore have been *vā̆ru- or *vəru-, not uru-. However, Werba’s proposal lacks con-
viction: the meaning of the Avestan personal name is, of course, unknown and
other interpretations are possible,\(^{61}\) while Werba’s conjecture *uruca in Yt. 5.7
is very doubtful and in fact unnecessary.\(^{62}\) “YAv. uru-” is a vox nihili.

An a-stem *ūra- ‘thigh’ is actually attested (BhagPūraṇa+), but this form is unlikely to be a
precious relic of thematic Indo-Iranian word for ‘thigh’.

For close textual association between *ūrū- and bāhū-, see Forssman (1986: 341–342),
who cites 20 passages in Vedic literature where these words are used side by side (e.g.,
ŚB 11.1.6.33 dvāu bāhū dvā úrū). A similar analogical remaking happened in Umbrian where
abl. sg. persi / pěrni ‘foot’ is due to the influence of the u-stem abl. sg. mani ‘hand’, and
vice versa, acc. pl. manf was remodeled after *pedf (Weiss 1993: 43–46). For the analogi-
cal influence of u-stem words for body parts in Germanic (where *fōt- ‘foot’ was remade
as *fōtu-) see Griepentrog (1995: 155) and for the case of Old English nosa ‘nose’ see Neri
(2003: 146\(^{42}\)); cf. also Hitt. mališku- ‘weak’ which was probably reshaped to a u-stem by
contamination with its antonym daššu- ‘strong’. (I would like to acknowledge advice from
Stefan Höfler, Craig Melchert, Sergio Neri, and Michael Weiss).

See Cantera (2017: 489).

YAv. urúi(a)- does not necessarily show the development of unaccented *fH to ur in
Iranian, see n. 51 above.

See Nikolaev (2021) for a defense of Bartholomae’s analysis ‘having white lambs’ (Bartholo-
mæ 1900: 137).

For the text see Schmeja (1976: 230); Oettinger (1983: 197–202); Swennen (1998: 211); and a
summary in Nikolaev (2021: 147\(^{10}\)).
Bailey (1979: 492) compared Ved. ārū- to Khot. hurāa ‘thigh’,63 but the Khotanese word is in all likelihood unrelated: the initial ḥ- is very problematic for Bailey’s etymology and while it may in theory be prothetic,64 the more natural explanation is to take it from Proto-Indo-Iranian *s, in which case Khot. hurāa (< *hurā̯-ka-65 ← Proto-Indo-Iranian *sūrā - PIE *suh₂-reh₂) may be directly related to Latin sūra ‘calf of the leg’ (< *suh₂-reh₂) and Greek (Ionic) Ὠρη ‘thigh (as part of the sacrificial victim)’ (< *suh₂-reh₂).66

Osset. (Iron.) weerag ‘knee’ (< *uara-ka-) compared to Ved. ārū- by Abaev (1989: 88) may in theory be phonologically compatible with Proto-Iranian *yrra- (< *(h₂)hL₂-lo-),67 but the semantic distance between ‘thigh’ and ‘knee’ is considerable and the Ossetic word may in fact belong to a different root.68 Nevertheless, traces of Iranian *yar- ‘thigh’ (< Proto-Indo-Iranian *yar- or *yur(r)-) may be found in Chechen varie69 ‘thigh’, Ingush voruv ‘thigh’, and, with a semantic shift, Bats varang ‘shoulder’: these Nakh words are isolated in North East Caucasian (there is no comparative material in Dagestanian languages70), which lends credence to Abaev’s view that they may represent Alanian loanwords.71 Beside this rather tenuous evidence for Iranian *yar-, Ved. ārū- remains isolated in Indo-Iranian.

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63 The meaning ‘thigh’ is assured by the passages in the late Khotanese medical text Sīddhasāra for which Tibetan and Sanskrit versions are known. For the declensional type cf. loc.pl. -āvā.
64 Cf. hāma- ‘raw’ < *āma- or hāysā ‘skin, hide’ < *yā-. Note the recent work by Kümmel (2020) arguing that “prothetic ḥ-” in Khotanese may in fact go back directly to *h₂.
65 *ū would have been regularly shortened before *r in Khotanese.
66 The preform *(h₂)hL₂-lo- / -léh₂- would probably lead to Proto-Iranian *yrrā- (with a loss of the laryngeal, see Cantera (2017: 489)) > *yrrā́ - *yrrā-, but the initial *y would have been reflected in Khotanese as b-, cf. biryga- ‘wolf’ (Proto-Iranian *yṛka-), bīle ‘intestines’ (< *yṛda- ‘soft’), bilga ‘kidney’ (< *yṛtka-), balysana ‘limited district’ (< *yṛjana-), etc.
67 Cf. hoarzond ‘high; height’ < Proto-Indo-Iranian *bhəɾj̥ant(a)-, Ved. bhānt-; zërđae ‘heart’ < *pṛdarjā-, Ved. ḍṛjā-.
68 Osset. weerag is usually taken to be from PIE *yel- ‘to turn, to bend’ (Bielmeier 1977: 229–230).
69 In the transliteration of Nichols & Vagapov (2004); the forms are cited in the nominative singular.
70 See Klimov & Khalilov (2003: 85); Comrie & Khalilov (2010: 210–211).
71 Abaev (1959: 100 & 1989: 88). The Iranian origin of varie is accepted in the etymological dictionary of Chechen (Vagapov 2011: 174–175). Several other words for body parts in Nakh languages have been borrowed from Iranian, e.g., Chechen tūara ‘teat’ (Osset. Iron. tar ‘chest’ < Iran. *tāra-), t’ingar ‘belly’ (Osset. Iron. daŋgæal ‘swollen’), Ingush bokqar ‘croup, inguines (in a bird’s digestive system)’ (Osset. Iron. boqqwr ‘double chin’ < bog ‘uncastrated bull’ + qwyr ‘neck’), Ingush gholyg ‘knucklebone (in a game)’ (Osset. Diger. ḡölæ ‘knucklebone, joint’), Chechen qías ‘mane’ (Osset. qís < Iran. *qajša-). For linguis-
3.3
Assuming that the proposed derivation of Ved. īrū- from *(h₁)u̯r₁h₁x-Lo- does not flounder on dubious phonology, what could the underlying root *(h₁)u̯elh₁x- or *(h₁)u̯erh₁x- be? There are two possibilities.

3.3.1
First, we may consider the root *h₁u̯erh₁x- ‘wide, broad’.\(^{72}\) An adj. *h₁u̯r₁h₁x-lo- ‘broad’ would not be out of place in a Caland system which is well documented for this root.\(^{73}\) There are ample parallels for words with the meaning ‘wide, thick, fat’ giving rise to words for ‘thigh’: cf. PDE thigh < Gmc. *þeu̯k-, Lith. tūkti ‘to be(come) fat’\(^{74}\) or Lat. femur ‘thigh’ vs. Gk. ἑυρός ‘thick’.\(^{75}\) Similarly, adj. *h₁u̯r₁h₁x-lo- may have acquired the meaning ‘thigh’ via the mechanism known as ‘transferred epithet’, assuming that adj. *h₁u̯r₁h₁x-lo- ‘thick’ was used in a fixed expression with a word for ‘leg’ (cf. Swed. (dial.) bus-lägg ‘thigh’ lit. ‘swollen leg’\(^{76}\) or Wakhi bajlóng ‘thigh’ lit. ‘thick leg’\(^{77}\) or was simply substantivized as ‘the thick one’.\(^{78}\)

3.3.2
But there is a different etymological possibility that allows for directly comparing Ved. īrū- with a word for ‘thigh’ in a different IE language. This is the analysis pursued in this paper.

Hitt. (u)walla.\(^{79}\) (c.) was identified as a name for a body part early in Hittite studies, and, on the basis of attestations known at the time, Alp (1957: 26–27) proposed a contextually plausible translation ‘thigh’, which has been
widely accepted in later scholarship. Both humans and animals have a right and a left walla - made up of bones and meat, the latter being particularly desirable; 80 in catalogs of body parts, walla - is listed between the lap and the knee, and, in the vocabulary list KBo 1.51. rev. 6, walla - translates Akk. pēmu ‘thigh’ (CAD/P 321). 81 Next to Hitt. walla - we find an i-stem walli - , easily identifiable as a Luwian intrusion: for instance, the word is used in Hittite-Luwian ritual fragment KUB 35.146 (MS, CTH 767) where we find acc. sg. wallin and acc. pl. wallinza. 82

In her study of Hittite construction rituals, Kellerman (1980: 70–71) argued that in KBo 4.1 obv. 47 ff. (CTH 413) and KBo 15.24 ii 20 (CTH 415A) the word walla - refers to metal stakes laid at the foundation of a temple. Tischler (1995) took the construction usage as the original one and argued that walla - ‘stake, post, bolt’ is related to Gk. ἧλος ‘nail’ and Goth. walus* ‘staff’. 83 However, it seems more likely that the meaning ‘stake’, etc. is secondary, owing to the metaphorical use of the word for a body part; 84 in fact, it cannot be excluded that the reference in construction rituals is to metal objects (models) that were shaped like a thigh. Under the view that ‘thigh’ is the original meaning of Hitt. (UZU) walla -, the word has remained etymologically isolated. 85

Phonologically, a comparison with Ved. āṛu- ‘thigh’ does not seem to present any problems, even though the exact preform of Hitt. walla - cannot be determined with complete certainty: the Hittite word is best taken from *(h₃)yōlhₓ-lo -, 86 but *(h₁)yélh₁-(l)₀- and perhaps even *(h₁)yélhₓ-lo- may be equally possible. 87 Under any analysis, Hitt. walla- ‘thigh’ goes back to a root *(h₃)yélhₓ- and

80 The uncanny similarity between Hitt. wallaš/n ḫaštai ‘(meat on the) thigh bone’ (see Poetto (2000: 109)) and Ved. āṛvastha- (ŚB 8.7.2.17+), Pāli uratthi ‘thigh bone’ is perhaps worth mentioning.
81 See Cohen (forthcoming).
82 See Tischler (1995) and HEG 4.231–234 with updated bibliography to which one should add Mouton (2005: 140–141).
83 On this root see Neri (2003: 255–257).
84 As Tischler himself correctly observed, we are dealing with “ein Bauelement, das ähnlich wie ein Schenkel geformt ist”. Comparable metaphors are found in OE scīa ‘leg’ vs. MHG schie ‘post’ or Gk. xiōn ‘pillar’ and Arm. sīw ‘id.’ (< *kih₁,yōn), compared to *(s)kih₂-s- ‘shin’ (Skt. aṣṭhōvā-, YAv. ascām ‘shank’) by Karl Praust (apud Lubotsky 2002: 323).
85 Kloekhorst (2008: 944), unaware of Tischler (1995), states that there is “[n]o further etymology”. Weiss (2010: 27387) tentatively took walla- from *yat-s-lo- and compared Umbr. vatava identified by him as a body part, possibly thigh.
86 Plain thematic o-grade *(h₂)yūlhₓ-o- would be expected to lose the laryngeal by the Sausser Effect and come out as Hitt. *wala- (Kimball 1999: 341–344), but also the references in n. 30 above); in theory, however, *(l)l₁ may be ascribed to the influence of Luwian (cf. acc. pl. wallinza mentioned in the main text above).
87 *(h₁)yélhₓ-(l)₀- would be expected to give ūlla-; cf. *(h₂)yṛgi- > ḫurki- ‘wheel’, *(h₂)yṛne- >
is thus fully compatible, phonologically and semantically, with Ved. āurv- if the latter goes back to analogically remade *(h)x-ulh₂-Ló- or a derivative thereof.88

3.3.3
A tertium comparationis for Ved. āurv- and Hitt. walla- may be found in Latin: this is the word volva (Var.+), Class. Lat. vulva (f.) ‘human or animal womb; female sexual organ’.89 The standard etymology suggests a connection with the root *u̯el- ‘to turn, wrap up, enclose’, assuming that ‘uterus’, viz., ‘membrane enclosing a fetus’ was the original meaning of the Latin word.90 This is not an unreasonable approach: even though the meaning ‘female genitals’ (Pers.+ is not attested for vulva much later than the meaning ‘womb’, the diminutive vulvula is used by Gn. Naevius (3rd cent. BCE) in the meaning ‘sow’s womb used as food’.91 Nevertheless, in theory it remains possible that vulva originally referred to external female genitalia and then started to be applied to uterus secondarily. Under this (admittedly speculative) assumption one may tentatively entertain an etymological connection between Lat. vulva and the Vedic and Hittite words for ‘thigh’.92 The immediate phonological advantage of this analysis over the traditional connection with the root *u̯el- ‘to enclose’ is the explanation of vulva with its unassimilated cluster *-lu- as a syncope product of pre-Latin *u̯elaya.93

88 After this paper was presented at the 40th East Coast Indo-European conference in June of 2021, I was pleased to learn through the courtesy of Václav Blažek that he already proposed a comparison between Ved. āurv- and Hitt. walla-, without, however, addressing the long ū of the Vedic form (Blažek 2020: 55).

89 For the change *o > u / _IC cf. *uelt ‘wants’ > volt > vult, see Weiss (2020: 151).

90 See de Vaan (2008: 689). The usual comparandum is Ved. úba- n. (RV 10.51.1+), úba- (VS 19.76+) ‘womb’ (see AlGr 2.2: 867, EW/Aia 1.232), but the alternation úba- / úba- may suggest foreign origin of the Vedic word (Kuiper 1955: 179). Recently, Merritt (forthcoming) argued that Lat. volva is related to Ved. úrvá- ‘enclosure’ and Gk. εἰλύω ‘wrap’ from a root *u̯elh₂-.

91 Fr. 23 Ribbeck; codd. bulbam.

92 Hitt. walla- was tentatively compared to Lat. vulva by Carruba (1991: 174) in the context of his (very doubtful) connection with Lyc. lada- ‘wife’ as “die Umhüllte”.

93 For syncope feeding e > o / _T cf. *u̯eluyō ‘roll’ > volvō (Weiss 2020: 135 & 150).
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(\text{TP}(h_x)\text{uel}_x\text{u̯eh}_{294}) where the medial \text{*-a-} would be the expected vocalization product of the root-final laryngeal posited in the hypothetical root \text{(h}_x\text{uel}_x\text{u̯eh}_{-}} in order to explain Ved. \text{ūrú}. By contrast, pre-Latin \text{*uel-üâ} from PIE \text{*uel-} ‘to enclose’ (so the traditional etymology) would be expected to give \text{*volla}.\text{95}

Granted ‘female genitals’ was the original meaning of Lat. \text{vulva}, how would the comparison with Hittite and Vedic words for ‘thigh’ work semantically? Across cultures, thighs are a common euphemism for genitals. One term for intercourse in Greek comedy is \text{διαμηρίζειν} ‘get between the thighs’ (Ar. \text{Av. 669}), which reminds of Apuleius’ coinage \text{interfeminium} ‘the space between the thighs’ (Apul. \text{Apol. 33}), but hardly served as its model.\text{96} Queen Medb in Irish heroic saga is in the habit of offering sexual intimacy to men in exchange for alliances or services, calling these favors \text{cardes mo sliasta-sa fessin} ‘the friendship of my thighs’ (LL 97). In Vedic, \text{sakthi} ‘thigh’ (du.) is regularly used to refer to female genitals, e.g., \text{út sakthyòr grdám dhehi} ‘bring the penis into the two thighs’, uttered by the priest during the performance of the Āśvamedha ritual (TS 7.4.19)\text{97} or an even more explicit phrase \text{prayapsyánn iva sakthyàu} \text{| vi na indra mfîdo jahi} ‘like someone who is going to bring the penis into the two thighs, smash aside our enemies, o Indra’ (TB 2.4.6,5.2–35 ~ ĀśŚS 2.10.14).\text{98} Examples could easily be multiplied.\text{99} In fact, there is at least one specific

\text{94} PIE \text{o-grade *yool}_x\text{u̯eh}_{2} > \text{*yol-u̯eh}_{2} (with the Saussure Effect) would have given \text{*volla}, cf. \text{*soll}_x\text{u̯o} ‘whole’ > \text{*soll}_x\text{o} > \text{sollo} (→ \text{sollers} ‘skilled’). PIE \text{zero-grade *(h}_x\text{u̯l̥h}_x\text{u̯eh}_{2} would have given \text{*lāva}, cf. \text{*h}_x\text{u̯l̥h}_x\text{neh}_{2} ‘wool’ > lāna.

\text{95} The root \text{*uel-} ‘to enclose’ did not have a root-final laryngeal: Ved. \text{y}r- (in which several PIE roots have fallen together) is \text{anuit} and Gk. \text{eîkìs} and OIr. \text{fîllim} do not indicate a laryngeal either (compare further Hsch. γ 106 γάλλια· ἔντερα < *\text{u̯l̥-no}>). Lat. \text{volvō} ‘to roll’ (if from the same root) goes back not to \text{*u̯elau̯e/o} with a laryngeal reflex but to \text{*u̯eluu̯e/o}, a thematized \text{u}-present of the type Gk. \text{τανύω} ‘stretch’, \text{ἀνύω} ‘accomplish’, etc. De Vaan (2008: 689) does not comment on the phonological difficulty of deriving Lat. \text{vulva} from \text{*uel-u̯ā}; the reason he accepted this etymology may have been Schrijver’s dismissal of the development \text{*lî > Lat. ll} (1991: 293–294; see also Prósper 2017: 90–95), but this sound change is in fact beyond doubt (Driessen 2005: 41–48).

\text{96} Cf. also \text{μηρόν \text{μεταξ́} ‘(penis growing) between the (woman’s) thighs’ (Archil. fr. 66) or Solon 16.2 (Gentili–Prato) \text{μηρόν \text{μετάφιον} ‘desiring thighs’ (in a pederastic context). Note also the clever word-play in an epigram of Rufinus (AP 5.36.2 = 12.2 Page), in which \text{μηριόν} is employed to signify the female genitalia (\text{τίς ἔχει κρείσσονα μηριόν} ‘which of the three girls had the best pussy’): the form is perhaps best interpreted as acc. of an \text{ā-stem *μηρίον} which at the same time makes an allusion to the name of the hero Meriones. See Watkins (1995: 265–276).

\text{97} On this passage see Nikolaev (2015: 232–235).

\text{98} Parallels are not limited to Indo-European traditions: Bibl. Hebrew \text{yarek} ‘thigh’ is used to refer to male genitalia at Gen. 24 and to a woman’s womb (or external genitals?) at Num. 5.22.
instance in which a word for female genitals may be etymologically related to a word for thigh elsewhere in Indo-European, namely, Gk. ’ἐκτάριον’ ‘female genitals’ (Hp. Mul. 2.174) for which Weitenberg (1976) offered a compelling comparison to Hitt. īkt-‘leg’.

In view of these parallels, the proposed derivation of Lat. vulva from the same root as Ved. āūrū- and Hitt. walla- ‘thigh’ becomes a possibility to consider seriously: the meaning ‘female genitals’ may be due either to an euphemistic use (*h₃)yelhᵽ-yō- ‘thigh’ > ‘female genitals’) or to a morphological derivation of some kind (e.g., possessive *(h₃)yelhᵽ-yō- ‘occupying the thighs’ or locatival *(h₃)yelhᵽ-yō- ‘located at/between the thighs’).

3.4
To conclude this section, three terms for body parts have been argued to be etymologically related: Ved. āūrū- ‘thigh’ (< *yūrrū- < *(h₃)yelhᵽ-Lu- ← *(h₃)yelhᵽ-Lo-), Hitt. walla- ‘thigh’ (< *(h₃)yelhᵽ-lo-; *(h₁)yelhᵽ-o- or *(h₁)yelhᵽ-(l)o-), and Lat. vulva ‘external female genitals’ (< *(h₃)yelhᵽ-yō-). Even though the exact pre-form of the Hittite word cannot be determined with complete certainty (see 3.3.3), while the comparison with Latin vulva requires an additional semantic assumption, namely, that the meaning ‘uterus’ is secondary (see 3.3.3), the

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100 Note also H.D. Jocelyn’s suggestion that Lat. fēminal (n.) ‘female genitals’ may be a derivative of femur, feminis with a long vowel analogical to fēmina (apud Adams 1982: 93). Even though there is little reason to reject a straightforward connection with fēmina.

101 o-stem *(h₃)yelhᵽ-yō- is reconstructed here under the assumption that the word for female genitals and uterus secondarily became feminine in Latin due to its meaning and was transferred to the ǎ-declension.

102 Cf. Ved. ṛṣ́d-‘high’ < *ṛṣ́ras- ‘occupying height’ (*ṛṣṛ-er-es > Gk. ἓρως; but see Martin Peters apud EWAia 1.262) or OCS vslovs ‘sorcerer’ < *ul̥ks-s-ūo- ‘having magical powers’ (*u̯elk-s-es- > Ved. várcas- ‘brilliance, vital power’, *u̯lk-s-rō- > Hitt. u̯läššara- ‘skilled’; see Klingenschmitt (1994: 251); Oettinger (2017: 260)). For possessive denominal -yō- see further AiGr 2.2: 658 and Rix (1981: 285–287).

103 For locatival function of -yō- cf. *pr̥h₂-yō- ‘located in the front’ > ‘first’ (Ved. púrva-, Toch. B parwe ‘earlier’, pārweṣṣa ‘first’, OE forwest ‘first’, Gk. πρῶτος ‘prow’, etc.), *k̑e̯-yō- ‘located here’ > ‘close’ (Ved. séva- ‘dear’, Lat. cívis ‘citizen’, see Vine 2006b: 148–149)), *sel-yō- ‘by oneself’ > ‘one’s own’ (OIr. selb ‘property’), see Neri (2013: 197, 199). However, according to another school of thought, the function of -yō- in *pr̥h₂-yō-, etc. was “kontrastiv-exklusiv” / oppositional (Vine 2006b: 148 (with references); Dunkel 2014: 217; Oettinger 2017).

Another way of analyzing Proto-Italic *u̯elkā́yā́- is by assuming a derivative of *(h₃)yelhᵽ-u- or even a remade dual form of this stem, but a direct comparison of this hypothetical u-stem with Ved. āūrū- ‘thigh’, du. āūrā would be reckless.

104 See above for the likely alternative that there never was a u-substantivalization of thematic *(h₃)yelhᵽ-Lo-, but thematic *(u)āūrā- < *yūrrā- < *(h₃)yelhᵽ-Lo- was remade as a u-stem by contamination with bāhū-‘arm’.
main attraction of this analysis is the phonological explanation of the long vowel in Ved. ūrū- ‘thigh’ as a regular product of a “long syllabic resonant” in the sequence *(h)xu̯elh-x-. At present, I remain agnostic about further connections of the root *(h)xu̯elh-x-; the available evidence is insufficient to determine the quality of the root-final laryngeal or establish whether there was an initial laryngeal in this root. The development *(h)xu̯elh-x-LV- > *üyorrrV- > ūrū- shows that the sequence -rr- that arose secondarily in Indo-Aryan after the loss of the laryngeal was eliminated through degemination in accordance with predictions made in section 2 of this paper.

4 Further examples of rhotic degemination

Following the adage that ten bad etymologies are better than one good one, I would like to signal several other etymological possibilities for Sanskrit words containing otherwise inexplicable prevocalic -UL-. As often with etymologies, they range from merely possible to unprovable, questionable, dubious, hopeless, ludicrous, and outlandish. One problem shared by the etymologies presented below is the total absence of comparative evidence for a liquid suffix. For instance, the old comparison between Ved. mú́la- ‘root of a plant’ and Gk. μῶλυ ‘mythical herb’ may be revived under the assumption that mú́la- < *mlh-x-Lo- (while μῶλυ < *mōlh-x-u-), but the reconstruction of the suffix *-ro- or *-lo- in this form is entirely hypothetical. The quality of some other examples is diminished by the uncertainty about the meaning of the Sanskrit word. For instance, if Ved. śīrá- (always of fire in the RV, also as a first compound member in śīrá-śocis-) means ‘making hot/cooked’, the word may be compared to Ved. śrā́ya-ti ‘be fervent, become cooked’ and derived from *k̑l̥h-x-Ló-; but the exact mean-

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105 Blažek (2000: 55) compared the root *u̯el- ‘to turn’ (see n. 88 above) and cited some of its derivatives referring to body parts: Lat. valgus ‘bow-legged’, OIcel. vil (pl.) ‘intestines’, Gk. γάλα ‘entrails’. While the meanings of these words agree with the concept of bending and curving inherent in the root *u̯el- (cf. Gk. ἐλαξ used of intestines by Aristotle P.A. 675b 24), they still remain semantically distant from ‘thigh’. Another problem is that the root *u̯el- did not have a root-final laryngeal (see n. 95 above) which would be necessary for the explanation of Ved. ūrū- advanced in this paper.

106 None of the proposed cognates require the reconstruction of an initial laryngeal. If Hitt. walla- is taken from a zero-grade *(h)xu̯elh-x-lo- (see n. 87 above), the initial laryngeal can only have been *h₁.

107 Adapted (and mistranslated) from Lehrs (1902), whose ninth commandment for philologists was “Du sollst nicht glauben, dass zehn schlechte Gründe gleich sind einem guten.”

108 The underlying root *kleh₁- may be an extended form of *kel- (LIV 323, Lat. calère ‘be warm’), see EWAia 2.668–669.
ing of the Vedic word is unknown. Another example is Ved. kū́la- ‘slope, hillside’ (RV+) is uncertain:112 Vine’s derivation from *kl̥h3-o- ‘elevation’ is very plausible (2006a: 507), but his solution requires a secondary thematization of an unattested root noun *kūl.113 Building on Vine’s proposal, I submit that the Vedic word may go back to *kl̥h3-Lo- ‘elevation’ (from the root *kelh₁, Lat. culmen ‘summit’, Lith. kėlti ‘raise, lift’, PDE hill).114

Besides familiar dhīra₁ ‘wise, characterized by insight’ (dhí-), there is another word dhīra₂ (BhagGītā+) that refers to a different set of personal qualities: ‘steady, brave, energetic, well-controlling, self-possessed’.115 It cannot be made from the root dhr̥- ‘to uphold’ which is aniṭ (cf. ipv. didhr̥tam, dhr̥tá-, dhartár-, dháram-, etc.). According to AiGr 2.2: 857 (followed by EWAia 3.278), dhīra₂ is etymologically identical with dhīra₁ which was reanalyzed in post-Vedic times as a derivative of dhṛ-, which is not implausible, albeit unprovable. Even though the late date of the Sanskrit word invites caution, a supposition may be made that dhīra- < *dhīr-rá goes back to the same form *dhl̥rö as Gk. θαλερός ‘blooming, fresh’ (often used of people in the meaning ‘vigorous, robust’) and Arm. dalar ‘green, fresh’ (for the root see LIVAdd. s.v. *dhel₁-).116

109 EWAia 1: 357, following the lead of Thieme.
110 RVC ad RV 5.52.12 notes “the fact that the word is regularly followed by cid ‘even’ and often refers to a person receiving divine aid despite his condition”.
111 Lubotsky (1988: 28) surmised that the word is non Indo-European.
112 Mallory & Adams (2006: 181) compared OIr. cúl ‘back’ and Lat. cúlus ‘arse’ (< *kuh₁-lo-), which does not convince semantically.
113 As Vine himself admits, this is “le fait le plus dérangeant”.
114 A plausible alternative is *kr̥h₁-Lo- ‘Abhang’ from the root *kerh₁- ‘hang’ (Lith. kūrti, LIV 353) for which Gk. χρηνός ‘embankment, edge of a river’ vs. χρέωμαι ‘I am suspended, hang’ provide a nice semantic parallel. I thank Stefan Höfler for a discussion of this idea.
115 On 23 July 1861 Otto Böhtlingk wrote to Rudolf Roth from St. Petersburg: “dhīra- macht mir viel Kopfbrechens. Aus der Bedeutung kug, verständig kann ich die von beständig nicht recht entwickeln” (Brückner & Zeller 2007: 302). Two homophonous words dhīra₁ ‘wise’ and dhīra₂ ‘firm’ were also accepted by Gonda (1936: 169).
116 Gk. θελερός is probably remade from *dēleros (< *dhl̥r₁-ro-) with later accent shift by analogy to oxytone ro-adjectives; the root vowel /a/ was imported from the nasal-infixed verbal
Greek and Armenian words provide an attractive comparandum to Skt. *dhīra-2 under the theory that its original meaning ‘fresh, energetic’ in post-Vedic times developed to ‘steady, firm, well-controlling’, possibly under the influence of the root *dhr̥-.

RV 10.97.9c (= VS 12.83c) contains the word *sīrā- the meaning of which is debated: ḯṛṣṭrīr namā vo mātā | ātho yūyāṁ stha nīṣkr̥ṭih | *sīrāḥ pataṭrīṇī sthana | yād āmāyati nīṣ kr̥tha “your mother is the ‘Restorer’ by name, and you all are ‘Expellers’. You (sciū. the healing plants to whom the hymn is addressed) are *sīrāḥ with wings. You expel what causes affliction”. The phrase *sīrāḥ pataṭrīṇī sthana was replaced by saràḥ pataṛīṇī stha(na) in AVP 11.6.5c, TS 4.2.6.2c, MS.2.7.13c, and KS.16.13c showing that the meaning of the word *sīrā- had become obsolete already in the Vedic period. Ved. *sīrā- normally means ‘stream’ (4x in RV), and Stephanie Jamison translated the problematic pāda as “[y]ou are streambeds [= stalks] with wings [= leaves]”, while Geldner (1951–1957: 3.307) thought that “sīrā muss hier einen anderen Sinn haben.” If the context suggests that *sīrāḥ pataṛīṇīḥ means something like ‘winged expellers’, perhaps the hapax *sīrā- may go back to virtual *sr̥h3-Leh2 ‘assailant’117 from the root *serh3- of Gk. ῥώμαι ‘move violently’ and Hitt. šarḥ- ‘to thrust oneself at, to rush’ (LIV 535). Needless to say, this is merely a possibility.

The name of the Pūrus, an Aryan tribe that vied with the Bharatas for pre-eminence in Ṛgvedic India and apparently fought on the side of the Dāsas in the Ten Kings’ War, may be a substantivization of *pūṛa- < *pL̥h3-x-Lo-.118 The possibilities for root analysis are virtually limitless: for instance, *pūṛā- may go back to the root *pelh1- (LIV 469) found in Gk. πάλλω ‘shake (a spear)’, πόλεμος ‘war’, and perhaps Lat. populus ‘group of warriors brandishing their spears’ < *pep(l)h1-ô-.120 Of course there is also *pleh1- ‘to fill’ that reminds of the Celtic tribe Helvetiī and a handful of other roots of suitable structure.121 In the end,
this analysis, too, is merely a possibility, since the meaning of the name Pūrū- remains unknown.

Future scholarship will show if there is value to any of the proposals made in this section.

5 Conclusion

This paper has examined the curious synchronic absence of geminate -rr- in Sanskrit (evinced by the facts of Vedic sandhi) and attempted to identify its diachronic antecedent in the PIE constraint against heteromorphemic geminates which received additional support from the contact between Indo-Aryan and Dravidian languages in which /r/ is non-geminal. The central hypothesis of this paper is that new -rr- sequences arising in Indo-Iranian and Indo-Aryan from PIE *-LL- or *-LHL- after merger of *l with *r and the loss of the laryngeal were repaired through degemination. While the development of sequences like PIE *Cer-lo- or *Colh₃-ro- in Sanskrit cannot be established with certainty, one prediction of the degemination hypothesis, namely, the development of PIE *(h)xLLV- to Sanskrit (h)xUrV-, is borne out by several examples: mūrá- ‘stupid’ < *mūrra- < *mr₃-lo- (analyzed by Nussbaum as a direct counterpart of Hitt. marlant- ‘stupid’), ārū- ‘thigh’ < *yūrru- < *(h)xゥル₃-Lu- ← *(h)xゥル₃-Lo- (cf. Hitt. walla- ‘thigh’) and perhaps some others.

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