Hittite *paḫḫweni*, Greek πυρί, and their implications for Indo-European ablaut

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§1 On 'fire'

[1] According to Schindler's (1975:10) widely accepted reconstruction (cf. Ringe 2017:309; *NIL*: 540–2), the Proto-Indo-European (PIE) word for 'fire' (N) had an inflectional paradigm like (1) in which:

- SG forms showed "proterokinetic" (PK) inflection.
- PL forms supplied by an internally derived, grammatically **singular** "amphikinetic" (AK) collective.

(1)

PIE	SINGULAR	COLLECTIVE
NOM/ACC	**péh₂-wr̥*	**péh₂-wōr*
GEN	**ph₂-wén-s*	**ph₂-un-ós*
LOC	**ph₂-wén-i*	**ph₂-un-í*
LOC2	**ph₂-wén*	

· Note in (1) that collective NOM/ACC **–wōr#* derives from pre-PIE ***–wor-h₂#* (where pre-PIE ***–h₂* > PIE */-h₂/ ⇔ N.NOM/ACC.PL) via SZEMERÉNYI'S LAW (Szemerényi 1962; Nussbaum 1986:129–30).

[2] Regarding the attested reflexes of (1) there is general agreement with respect to (2) (*NIL*: 540–4):

(2) a. SG forms are directly continued in Hittite: NOM/ACC *paḫḫur*; GEN *paḫḫwenaš*; LOC *paḫḫweni*.

b. Collective NOM/ACC *péh₂-wōr* (or *ph₂-wṓr*?) is the source of reanalyzed SGs TB *puwar* 'fire' and (with analogical **n* from oblique) Goth. *fon* 'id.' (Schindler 1967:242–3, 1975:10; Ringe 1996:16–8, 2017:309; Simms 2009; Kim 2018:145; *i.a.*)

c. Other Germanic forms (OBL.SG Goth. *fun–*; ON *funi*, *fúrr*; OE *fȳr*; etc.), Umbr. **pir**, and the SG paradigms of Greek (NOM/ACC.SG πῦρ, OBL πῠρ-ός) and Armenian (*howr*, GEN *hroy*) are ultimately based on the collective weak stem **ph₂-un-ós* (Klingenschmitt 1994:243–4; Rix 1992:127; Olsen 1999:48–9, 533–6; Beekes 2010:1260–1; and references noted above).

[3] Discussion here concerned primarily with (2c) — major claims advanced are presented in (3):

(3) a. Reconstruction of NOM/ACC and other SG forms in (1) are essentially correct for PIE.

b. PIE OBL.SG stem **ph₂-wén–* was rebuilt in Proto-Nuclear-Indo-European (PNIE) as **ph₂-ún–*, which is the source of the IE forms in (2c) above.

c. The change in (3b) was a consequence of a systemic change in the operation of quantitative ablaut between PIE (as preserved in Anatolian) and PNIE.

§2 On "collective" and neuter plural

[4] The central problem for Schindler's (1975:10) reconstruction of 'fire' in (1) relates more broadly to the PIE status of the AK "collective:"

- Oldest IE languages show abundant evidence for N.NOM/ACC.PL forms with the formal properties of the NOM/ACC collective reconstructed by Schindler — e.g., (4–6).
- But in all such cases the oblique PL forms (i) show unambiguous plural inflectional morphology and (ii) do not show AK inflection.

(4)

*–*men*-stems	PIE[?] AK COLLECTIVE		IE PLURAL
NOM/ACC	*d^{h}éh$_1$-mōn	>	Ved. *dhā́māni* 'foundations', OAv. *dāmąm* 'creations'
DAT	**d^{h}h$_1$-mn-éi	⊁	Ved. *dhā́mabhyas*, YAv. *dāmabiiō* 'with " '
GEN	**d^{h}r-mn-é/ós	⊁	Ved. *dhármaṇām* 'of principles'

(5)

*–*es*-stems	PIE[?] AK COLLECTIVE		IE PLURAL
NOM/ACC	*wék^{w}-ōs	>	Ved. *vácāṁsi* 'words' (cf. OAv. *manå* 'thoughts')
INSTR	**uk^{w}-s-éh$_1$	⊁	Ved. *vácobhis*, OAv. *vacābīs(-cā)* 'with words'
LOC	**h$_2$m̥ĝ^{h}-s-í	⊁	Ved. *áṁhasu*, YAv. *ązahu* 'amid distresses'

(6)

'water'	PIE[?] AK COLLECTIVE		IE PLURAL
NOM/ACC	*wéd-ōr	>	Hitt. *witār* 'waters'
DAT	**ud-n-éi	⊁	Hitt. *widenaš* 'in the waters'

[5] The simplest explanation for (4–6) is that already in PIE:

(i) N.NOM/ACC forms in *–*ōC#* were grammatically plural (i.e., not singular "collectives").

(ii) Within these nominal paradigms the PL oblique cases were formed by adding regular PL inflectional endings to the same stem as SG oblique cases.

[6] This assessment is consistent with the (emerging) consensus regarding these neuter nouns, e.g.:

- Jasanoff (2008:144–5): "In late PIE the collective morphology of neuter plurals was confined to the nom.-acc. form itself…In the oblique cases, the endings would theoretically have been those of the singular…But such forms, **if they ever existed**, were pluralized within the IE period."
- Melchert (2011:396–7): "[T]he basis for *–h$_2$ as forming singular collectives is extremely weak. All paradigmatic evidence argues that *–(e)h$_2$ was already in PIE a plural ending…I therefore conclude that there is no evidence that the PIE suffix *–eh$_2$ **ever** formed inanimate singular nouns."

⇒ **Attested IE forms that have been traced back to PIE SG collective paradigms of the type posited by Schindler (1975) require some alternative explanation.**

[7] Two possible scenarios for Gk. πῦρ-΄, Goth. *fun–*, and the other forms noted in (2c):

(i) They derive from PIE forms that continue a pre-PIE AK collective, which had become separated from the regular paradigm of 'fire' already at the stage (i.e., a pre-PIE paradigmatic split).

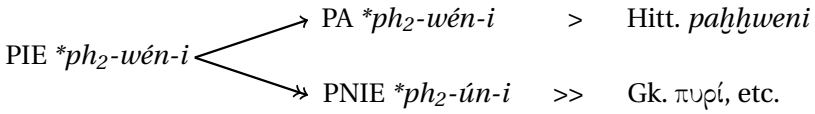
(ii) They derive from a different source entirely (§3; see Appendix I on Ved. *udán–* 'water').

§3 The diachrony of 'fire'

[8] General proposal — there was a morphophonological change in the operation of quantitative ablaut between PIE and PNIE, which is reflected in the differing shape of the weak stem of 'fire' in Anatolian and the NIE languages.

- This development is represented schematically in (7).

(7)



[9] Quantitative ablaut in PNIE is treated in §3.1, then in §3.2 compared to the Anatolian situation; §3.3 revisits 'fire' and §3.4 explores its implications for PIE.

§3.1 Modeling quantitative ablaut in PNIE

[10] A theory of the interaction between stress assignment and quantitative ablaut in PNIE has been advanced by Kiparsky (2010, 2018) — his core proposals:

(i) PIE had lexically stress-preferring morphemes, which attracted stress to themselves (ACCENTED) or to the preceding syllable (PREACCENTING).

(ii) Stress was assigned to the leftmost accented morpheme, otherwise the word's left edge (BASIC ACCENTUATION PRINCIPLE; Kiparsky and Halle 1977).

(iii) Quantitative ablaut was partially due to ZERO-GRADE — i.e., the accent-conditioned morphophonological vowel deletion process in (8).

(iv) Vowel deletion by ZG could trigger SECONDARILY MOBILITY in (9).

(8) ZERO-GRADE (ZG): */e, o/ → ∅ / ___ Ḿ
"*/e, o/ is deleted before an accented morpheme (/Ḿ/)."

(9) SECONDARY MOBILITY (2^{RY}M):
"When a syllable (σ) is eliminated, its accent shifts to the next syllable."

[11] Kiparsky's theory attains good empirical coverage in PNIE consonant stems — it accounts, e.g., for securely reconstructible AK and "hysterokinetic" (HK) word prosodic patterns like (10a) and (10b):

(10) a.

	'path.NOM.SG'	'path.GEN.SG'
UR	*/pent(-)oh₂-/	*/pent(-)oh₂-/
INFL	pent(-)oh₂-s	pent(-)oh₂-ós
ZG	–	pn̥t(-)h₂-ós
2^{RY}M	–	–
BAP	pént(-)oh₂-s	pn̥t(-)h₂-ós
SR	*[pén.toh₂s]	*[pn̥t.h₂ós]
	Ved. *pánthā*	*pathás*
	Av. *paṇt̊ā*	*paθō*

b.

'father.NOM.PL'	'father.DAT.SG'
*/ph₂tér-/	*/ph₂tér-/
ph₂tér-es	ph₂tér-éi
–	ph₂tŕ-éi
–	ph₂tr-ḗi
ph₂téres	ph₂tr-éi
*[pəh₂.té.res]	*[pəh₂.tréi]
Ved. *pitáras*	*pitré*
Gk. πατέρες	(cf. πατρί)

- In PIE oxytone **i*- and **u*-stems suffixal ablaut — but not stress! — is governed by partially different morphophonological principles; see the discussions of Kiparsky (2010:150–3), Keydana (2013), and Kümmel (2014).
- See Sandell (2015:181–4) for arguments that (10a) is monomorphemic in Vedic (and perhaps already in PIE).

[12] This approach correctly predicts that HK stress mobility in words with stem-final accent like (10b) depends crucially on the application of ZG and 2$^{\text{RY}}$M.

⇒ Stem-final stress emerges when ZG fails to apply — e.g., in weak stem of (11a).

⇒ Stem-final stress emerges when ZG applies but the accented *σ* is not eliminated — e.g., in (11b).

(11) a.

	'abundance.NOM.SG'	'abundance.INSTR.SG'
UR	*/b$^{\text{h}}$uh$_{\text{x}}$-món-/	*/b$^{\text{h}}$uh$_{\text{x}}$-mén-/
INFL	b$^{\text{h}}$uh$_{\text{x}}$-món-m̥	b$^{\text{h}}$uh$_{\text{x}}$-mén-éh$_1$
ZG	–	**X** ($^{\text{x}}$[.mn])
2$^{\text{RY}}$M	–	–
BAP	b$^{\text{h}}$uh$_{\text{x}}$-món-m̥	b$^{\text{h}}$uh$_{\text{x}}$-mén-eh$_1$
SR	*[b$^{\text{h}}$uh$_{\text{x}}$.mó.nm̥]	*[b$^{\text{h}}$uh$_{\text{x}}$.mé.neh$_1$]
	Ved. *bhūmā́nam*	*bhūmánā*

b.

	'father.INSTR.PL'	'father.LOC.PL'
UR	*/ph$_2$tér-/	*/ph$_2$tér-/
INFL	ph$_2$tér-b$^{\text{h}}$í	ph$_2$tér-sú
ZG	ph$_2$tr̥-b$^{\text{h}}$í	ph$_2$tr̥-sú
2$^{\text{RY}}$M	–	–
BAP	ph$_2$tr̥-b$^{\text{h}}$i	ph$_2$tr̥-su
SR	*[pəh$_2$.tr̥.b$^{\text{h}}$i]	*[pəh$_2$.tr̥.su]
	Ved. *pitŕ̥bhis*	*pitŕ̥ṣu*
		Gk. πατράσι

· But HK mobility reappears in the weak stem of (11a) if the dispreferred cluster can be resolved by */m/-deletion (whence Ved. *bhūnā́* 'id.'; cf. Kiparsky 2010:149). For further diachronic examples of the type in (11a) see Yates (2018).

[13] This approach also accounts for PNIE word stress and root ablaut in " secondary PK" neuter **u*-stem nouns like **doru*– 'wood', **ĝonu*– 'knee', and **sonu*– 'back' — e.g., (12):

(12) a.

	'knee.NOM.SG'	'knee.LOC.PL'
UR	*/ĝón-u-/	*/ĝén-u-/
INFL	ĝón-u-∅	ĝén-u-sú
ZG	–	ĝń-u-sú
2$^{\text{RY}}$M	–	ĝn-ú-sú
BAP	ĝón-u-∅	ĝn-ú-su
SR	*[ĝó.nu]	*[ĝnú.su]
	Gk. γόνυ	γνύσι
	Ved. *já̃nu*	(cf. YAv. *žnubiias*)

b.

	'back.NOM.PL'	'back.LOC.PL'
UR	*/són-u-/	*/sén-u-/
INFL	són-u-h$_2$	sén-u-sú
ZG	–	sń-u-sú
2$^{\text{RY}}$M	–	sn-ú-sú
BAP	són-u-h$_2$	sn-ú-su
SR	*[só.nuh$_2$]	*[snú.su]
	Ved. *sā́nūni*	*snúṣu*

[14] Yet as pointed out by Schindler (1975:7) the Anatolian outcomes of such **u*-stem nouns have different formal properties — in particular, the stressed root *[é] in the weak cases (vs. zero-grade) expected in "acrostatic" (AS) nominals, as in (13–14):

(13)

NOM/ACC.SG	**ĝón-u*	>>	Hitt. *gēnu* [ké:nu] 'knee'	cf.	Gk. γόνυ, Ved. *já̃nu*
GEN.SG	**ĝén-w-os*	>	Hitt. *gēnuwaš* [ké:n(u)was]		Gk. γνύσι (LOC.PL)

(14)

NOM/ACC.SG	**dóru*	>	Hitt. *tāru* [tá:ru] 'wood'	cf.	Gk. δόρυ, Ved. *dā́ru*
DAT/LOC.SG	**dér-w-(e)i*	>>	Hitt. *taruwi* [tá:r(u)wi]		Ved. *drúṇā* (INSTR.SG)

· I thus follow Schindler (1975:7) in taking the suffixal ablaut in (e.g.) Ved. *drós* 'of the tree' (< **dr-éw-s*) as as a (post-PIE) innovation; on Gk. γνύσι (*h. Merc.* 152; see Forssmann 1964) I follow Kiparsky (2010:147).

· It is unlikely that MS hapax INSTR ⟨*ga-nu-ut*⟩ (KUB 12.63 obv. 26) reflects **ĝn-éu-t* with zero-grade root (*pace* Hoffner and Melchert 2008:101 n. 111, Kloekhorst 2013:109), esp. in view of ⟨[*g*]*e-nu-ut*⟩ already in OS (KBo 17.7 obv. 12); it may be an error or, less likely, a reflex of **ĝón-u-t* with analogical *[o] from the inherited strong stem (prior to it being leveled out; the absence of plene spelling in the root — always optional! — would not rule out this analysis, contra Kloekhorst 2013:109 n. 9).

[15] The divergent Anatolian outcomes in (13–14) admit the possibility that quantitative ablaut in Anatolian (and PIE?) operated according to different principles.

§3.2 Modeling quantitative ablaut in Anatolian

[16] **Proposal:** Anatolian did not have ZG but instead the vowel deletion process given (in historical terms) in (15), which is conditioned by **surface** stress (cf. Yates 2017a, 2017b:193–5).

(15) PRETONIC VOWEL DELETION (PVD): */e, o/ → ∅ / ___ *σ́*
"*/e, o/ when it precedes a stressed syllable." (iterative)

[17] Under this analysis, accented morphemes can still trigger deletion of an accented vowel to their left, but **only** if deletion would allow them to attract stress (via 2^{RY}M).

· This pattern — vowel deletion in (10b) above and (16b) and (16b) below but non-deletion in (13b) and (14b) above and (20) below — is somewhat difficult to capture in a rule-based framework but can be implemented in classical OT (via "look-ahead"); see Appendix II — the derivations in (16), (18), and (20) are provided with corresponding tableaux in (28), (29), and (30) respectively.

[18] This more restrictive grammar still accounts for attested cases of HK stress mobility in Anatolian (with PVD in the weak stem), e.g., in (16–17) (see Yates 2017b:192–3, Yates to appear):

(16) a. */$h_2$wert-óy-m/ → *[$h_2$wr̥t-ó.y-m̥] >> Hitt. *ḫurdāin* [$\chi^{(w)}$ort:-á:i-n] 'curse' (ANIM.ACC.SG)
b. */$h_2$wert-óy-ós/ → *[$h_2$wr̥t-y-ós] > Hitt. *ḫurdiyaš* [$\chi^{(w)}$ort:-y-á:s] 'of the curse' (ANIM.GEN.SG)

(17) a. */pes-én-ms/ → *[p(e)s-én-m̥s] >(>) Hitt. *pišēnuš* [pisé:n-os] 'men' (ANIM.ACC.PL)
b. */pes-én-ós/ → *[p(e)s-n-é/ós] >> Hitt. [*p*]*išnāš* [pisn-á:s] 'of the man' (ANIM.GEN.SG)

- Crucially, in (16b) and (17b) the accented stem-final syllable is eliminated (/ái/ → [y], /én/ → [n]), which allows the accented inflectional ending to attract stress.

[19] This proposal also accounts for the non-application of root vowel deletion in the the weak stem of inherited AS neuter **u*-stems in Anatolian — i.e., (18b) and (19b):

(18) a. */ĝón-u-∅/ → *[ĝó.nu] >> Hitt. *gēnu* 'knee'
b. */ĝén-u-ós/ → *[ĝén.wos] > Hitt. *gēnuwaš* (↛ [ĝn̥.wós], [ĝń̥.wos])

(19) a. */dór-u-∅/ → *[dó.ru] > Hitt. *tāru* 'wood'
b. */dér-u-(e)í/ → *[dér.w(e)i] >> Hitt. *taruwi* (↛ [dr̥.w(é)i], [dŕ̥.w(e)i])

- Crucially, in (18b) and (19b) the root vowel does not delete because the accented inflectional ending would still fail to attract stress away from accented root to its left **even if it were deleted**:
  · [ĝn̥.wós], [dr̥.w(é)i] with regular PVD are inconsistent with BAP.
  · Anatolian lacks a vowel deletion process that would produce [ĝń̥.wos], [dŕ̥.w(e)i].
    · The lack of consonant-initial accented inflectional endings in Anatolian precludes a more direct comparison with (e.g.) Gk. γνύσι, Ved. *snúṣu* in (12), but the prediction of the analysis is that the Anatolian cognates of this class would have stressed full-grade of the root (e.g., LOC.PL PA **ĝén-u-su, *dér-u-su*).

§3.3 Quantitative ablaut in Indo-European and the development 'fire'

[20] How will the different ablaut grammars posited for PNIE and Anatolian affect the realization of 'fire'?

[21] The Anatolian reflexes of 'fire' can be derived under the assumption that (cf. Yates 2017a):

(i) PIE 'fire' is built from a root **peh₂–*, which is unaccented (*/peh_2/).
(ii) "Heteroclite" derivational suffix PIE **–wr̥/–wen–* had two allomorphs with different segmental and prosodic properties: strong */-wr̥-/, weak */-wén-/.

[22] Derivation of 'fire' in Anatolian then falls out straightforwardly via BAP as in (20):

(20) a. */peh_2 - wr̥ - ∅/ → *[$\text{páh}_2.\text{wr̥}$] > Hitt. ***paḫḫur*** [páχ^{w}ːor] (DEFAULT LEFTMOST STRESS)

b. */peh_2 - wén - í/ → *[$\text{ph}_2\text{wé.ni}$] > Hitt. ***paḫḫweni*** [paχ^{w}ːéːn-i] (LEFTMOST ACCENTED WINS)

- Suffixal vowel does not delete in (20b) for same reasons as the root vowel (18b) and (19b) above — deletion **still** would not allow the accented inflectional ending to attract stress away from accented suffix to its left:
  - · [x][ph_2-un-í] with regular PVD is inconsistent with BAP.
  - · Anatolian lacks a vowel deletion process that would produce [x][ph_2-ún-i]

[23] However, provided with the same set of inputs the PNIE grammar outlined in §3.1 produces a different output in the weak stem — i.e., (21b) with the regular application of ZG:

(21) a.

	'fire.NOM.SG'
UR	*/peh_2-wr̥-/
INFL	peh_2-wr̥-∅
ZG	–
2^{RY}M	–
BAP	péh_2-wr̥-∅
SR	*[$\text{páh}_2.\text{wr̥}$]

b.

'fire.LOC.SG'
*/peh_2-wén-/
peh_2-wén-í
ph_2-ún-í
–
ph_2-ún-i
*[ph_2ú.ni]

[24] PNIE *[ph_2ún-] is a viable historical source for Gk. πῦρ, πῠρός, Goth. *fun–*, and the other NIE forms in (2c) above (§1).

- Deriving these forms from *[ph_2ún-] requires essentially the same set of analogical innovations (viz., mutual influence of strong/weak stem) as standardly assumed under the traditional derivation from an AK collective weak stem in **[ph_2un-ˊ] (see the references cited under **[2]** above).
- Just one (trivial) additional step is needed in Greek — the analogical introduction of stress mobility, like the majority of monosyllabic 3rd decelension nominals in Greek (see, e.g., Probert 2003:73–6).

§3.4 Modeling quantitative ablaut in Proto-Indo-European

[25] **Proposal**: The ablaut grammar operative in Anatolian was inherited as such from PIE; the PNIE system is innovative.

[26] Two arguments that (tentatively) support this chronology:

(i) The PIE deletion grammar accounts for the inflectional patterns standardly assumed to be original in (PK) 'fire' and in (AS) 'knee' and 'tree' (cf. Schindler 1975).

(ii) The PIE deletion grammar is (relatively) transparent phonologically — vowel deletion is conditioned by an observable surface property, i.e., stress.

⇒ The PNIE system — surface opaque, with vowel deletion conditioned by underlying accents — is a first step in the development of the ablaut grammars of the daughter languages in which morphology plays a much greater role (cf. Bermúdez-Otero 2007, 2015 on the life cycle of phonological processes).

§4 Conclusions & discussion

[27] Summary of the proposal:

(i) Quantitative ablaut operates according to different principles in PIE than in PNIE :

- In PIE and Anatolian vowel deletion was conditioned by surface stress.
  - · Mid vowels are subject to deletion in pretonic syllables (by PVD in (15) above).
  - · An accented inflectional ending may trigger deletion of an accented stem vowel **only if** it will attract stress as a result (by 2^{RY}M in (9) above).
- In PNIE vowel deletion is conditioned by underlying accents (cf. Kiparsky 2010, 2018).
  - · Mid vowels are subject to deletion before accented morphemes (by ZG in (8) above).
  - · Deletion occurs regardless of whether the accented morpheme that triggers it attracts stress (e.g., PNIE */ph$_2$tér-sú/ → ***ph$_2$tŕ̥-su*** > Ved. ***pitŕ̥ṣu***, Gk. πατράσι 'among the fathers').

(ii) Reconstructing this systemic difference in quantitative ablaut predicts that:

- The weak stem of 'fire' was ***ph$_2$-wén–*** in PIE (reflected in, e.g., DAT/LOC.SG Hitt. ***paḫḫweni***), but ***ph$_2$-ún–*** in PNIE.
- The weak stem of (e.g.) 'knee' was ***ĝén-w/u–*** in PIE (reflected in GEN.SG Hitt. ***gēnuwaš***), but ***ĝnu–*** in PNIE (reflected in DAT/LOC.PL Gk. γνύσι).

(iii) The paradigms of 'fire' in at least Greek (e.g., DAT/LOC.SG Gk. πῠρί), Armenian, and Germanic are based on (or influenced by) the phonologically predicted PNIE weak stem of 'fire' ***ph$_2$-ún–***.

- These do not reflect an AK collective weak stem ****ph$_2$-un-´***, which is of dubious PIE status.

[28] At least one important morphological question arises from this analysis:

- ○ If (NOM/ACC) AK "collective" forms were grammatically PL already in PIE, what explains their tendency to become SG forms in the daughter languages?

[29] A potential solution, building (esp.) on Melchert (2000, 2011) and Nussbaum (2014):

- PIE had two types of PL, COUNT and SET, which were distinct for animate nouns in NOM.SG: COUNT.PL ⇔ */-es/, SET.PL ⇔ */-h$_2$/; neuters are assumed to lack this grammatical contrast: NOM/ACC.PL ⇔ */-h$_2$/ (Melchert 2000, 2011; cf. Eichner 1985).
- Yet N.PL count nouns may have had both count and set interpretations — these could be reflected in (22), where the set reading is the source of reanalyzed SG (cf. Nussbaum 2014:292–4).
- Similarly, PLs to neuter mass nouns could denote either "instances/sorts" (Melchert 2011:396) or "a body/mass" of the named substance (Nussbaum 2014:292–4); these two readings may be reflected in PL and SG forms like (23) (cf. Nussbaum 2014:303).
- **Hypothesis** — two readings in (22–23) correspond to COUNT.PL and SET.PL, which were grammatically distinct but formally syncretic in PIE neuter nouns.

⇒ IE N.NOM/ACC.SG forms with (historically) PL morphology would arise specifically from PIE SET.PLs, which tend to be reanalyzed as such due to their semantic similarity to SGs (esp. for mass nouns) and their lack of unambiguous PL marking.

(22) PIE ***h$_{1/3}$néh$_3$-mōn***
'names' > PL Ved. ***nā́mā(ni)***, OAv. ***nāmąm*** 'id.'
'set/pair of names; full name' > SG Goth. ***namo***, OHG ***namo*** (N > M) 'name'

(23) PIE ***wéd-ōr***
'waters' > PL Hitt. ***widār*** 'id.'
'body of water' >> SG Gk. ὕδωρ, Umb. ***utur*** 'water'

· See Melchert (2014) and Nussbaum (2014) on the diachronic development of the "instances" and "mass/body" readings of N.PLs respectively; synchronically, the latter are perhaps comparable to what Cowell (1964:369–70) terms "plurals of abundance" (see Corbett 2000:30–5, 238 and Acquaviva 2008:109–12 for discussion).

[30] Some new (morpho)phonological questions going forward:

- Is there other evidence for (or against) the hypothesized difference in the operation of quantitative ablaut between PIE/Anatolian and PNIE?
- Is there evidence for other differences in ablaut (or word stress) between PIE and PNIE?
- By what set of developments do these systemic differences emerge diachronically?

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§5 Appendix I — 'water' in Vedic

- Forms of the Vedic inflectional paradigm of 'water' attested in RV are given in (24):

(24)

	SG	PL	
NOM/ACC	*vā́r*	*udā́*	'water(s)'
INSTR	*udnā́*	*udábhis*	'with the water(s)'
ABL	*udnás*	—	'from the water(s)'
GEN	*udnás*	—	'of the water(s)'
LOC	*udán(i)*	—	'in the water(s)'

.

- For *udā́* (RV V.41.14d, VIII.98.7c) as NOM/ACC.PL, see Schindler (1972:12–3) (followed by Jamison and Brereton 2014:709, 1205).

- Paradigm in (24) was traced back to an AK "collective" singular by Schindler (1975:4).
- However, excepting suppletive NOM/ACC.SG the stress pattern in (24) is descriptively HK.
- Alternative proposal — (24) was rebuilt on the basis of PNIE "endingless" locative **ud-én*, which was reanalyzed as the stem (i.e., */udén-/).

  · This hypothesis will account for the prosodic patterns observed in (24), as shown by the (transponat) derivations in (25):

(25)

a.

	'water.LOC.SG'
UR	*/udén-/
INFL	udén-∅
ZG	–
2^{RY}M	–
BAP	udén-∅
SR	*[u.dén]
	Ved. *udán(i)*

b.

'water.GEN.SG'
*/udén-/
udén-ós
udn̥-ós
udn-ős
udn-ós
*[ud.nós]
udnás

c.

'water.INSTR.PL'
*/udén-/
udén-b^{h}í
udn̥-b^{h}í
–
udn̥-b^{h}i
*[u.dn̥.b^{h}i]
udábhis

§6 Appendix II — An OT analysis of PIE quantitative ablaut

- The interaction between word stress and ablaut described in §§3.2–3.4 above can be modeled in Optimality Theory (Prince and Smolensky 1993/2004) — core assumptions:

  (i) Accented morphemes have metrical structure in their lexical representation (Inkelas 1999, Kabak and Vogel 2001, i.a.) — specifically, a single left foot edge (cf. Idsardi 2009, Yawney 2018); in the general case, this foot edge coincides with the morpheme's left edge.

  (ii) Underlying metrical structure preferentially surfaces due to ANCHOR constraints that require faithfulness to foot edges (Özçelik 2014), but these constraints are evaluated gradiently rather than categorically (cf. Alber 2010, Alber and Arndt-Lappe 2012).

  (iii) Prosodic faithfulness constraints are dominated by constraints on syllable structure, which determine the possible locations of input feet in the output (i.e., no "exceptional" syllabifications due to underlying feet).

  (iv) Every input foot must have a correspondent in the output (i.e., MAX-FT is undominated). The correspondence between input and output feet may be imperfect (in violation of ANCHOR) because of syllabification or because there are more input than output feet.

- This analysis employs the constraints in (26) as ranked in (27):

(26) a. OBLIGATORINESS: A prosodic word must have at least one stressed syllable. **(OBL)**

b. MAX-FT: A foot in the input must have a correspondent in the output. **(MAX-FT)**

c. *STRUC-FT: Assign a violation for each foot in the output. **(*STRUC-FT)**

d. DEP-FT: A foot in the output must have a correspondent in the input. **(DEP-FT)**

e. TROCHAIC: Feet have initial prominence. **(TROCH)**

f. ANCHOR-L: The left edge of every foot in the input corresponds to the left edge of a foot in the output. Assign one violation (*) for each intervening syllable. **(ANCHOR-L)**

g. ALL-FEET-LEFT: Feet must be aligned with the left-edge of the prosodic word. Assign one violation (*) for each intervening syllable. **(ALL-FT-L)**

h. *PRETONIC-V: An unstressed non-high short vowel ([e, a, o]) in a pretonic syllable is not permitted in the output. **(*PRE-V)**

i. MAX-V: A vowel in the input must have a correspondent in the output. **(MAX-V)**

(27) MAX-FT, OBL, TROCH, *PRE-V ≫ DEP-FT, ANCHOR-L ≫ *STRUC-FT ≫ MAX-V ≫ ALL-FT-L

- Given these assumptions, 2^{RY}M arises precisely when deletion of the stem-final vowel allows both suffixal and ending accents to be realized without violating ANCHOR-L, as in (28) (= (16b) above):

(28)

/$h_2$wert-(oy-(os/		*PRE-V	TROCH	*STRUC-FT	ANCHOR-L	MAX-V	ALL-FT-L
a.	$h_2$wr̥.(tó).(yós)			**!		*	***
b.	$h_2$wr̥.(to.yós)	*!	*!	*	*	*	*
c.	$h_2$wr̥.(tó.yos)			*	*!	*	*
d. ☞	$h_2$wr̥t.(yós)			*		**	*
e.	$h_2$wert.(yós)	*!		*		*	*
f.	($h_2$wér).to.yos			*	*!**		

- Stress is assigned to the stem-final vowel, however, if deleting it would not be ANCHOR-improving — compare the winning candidates (29b) and (30c) with losers (29c) and (30d) (= (18b) and (20b) above):

(29)

/(ĝén-u-(os/		*PRE-V	TROCH	*STRUC-FT	ANCHOR-L	MAX-V	ALL-FT-L
a.	(ĝén)(wós)			**!			*
b. ☞	(ĝén)wos			*	*		
c.	(ĝń̥.wos)			*	*	*!	
d.	ĝn̥.(wós)			*	*	*!	*
e.	ĝen.(wós)	*!		*	*		*
f.	(ĝn̥.wós)		*!	*	*	*	

(30)

/peh$_2$-(wen-(i/		*PRE-V	TROCH	*STRUC-FT	ANCHOR-L	MAX-V	ALL-FT-L
a.	(ph$_2$wé).(ní)			**!		*	*
b.	pah$_2$.(wé.ni)	*!		*	*		*
c. ☞	(ph$_2$wé.ni)			*	*	*	
d.	(ph$_2$ú.ni)			*	*	**!	
e.	(ph$_2$we.ní)	*!	*!	*	*	*	
f.	(ph$_2$u.ní)		*!	*	*	**	
g.	(páh$_2$).we.ni			*	**!*		

· For simplicity of exposition all candidates that violate undominated MAX-FT are excluded from the tableaux in (28–30) above; in those candidates that contain only one foot, this foot stands in correspondence with both input feet (in most cases, with imperfect anchoring of one input foot or the other).