Emergent Mobility in Indo-European *-*r*/*n*-stems and Its Implications for the Reconstruction of the Neuter Plural*

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This paper proposes a new account of the oblique singular case-forms of Proto-Indo-European "simple" neuter *-*r*/*n*-stems that exhibit stressed inflectional endings in the Indo-European languages. Unexpected on the "acrostatic" reconstruction of this category, such forms were previously held to reflect the singular-marked oblique case-forms of a suppletive "amphikinetic" collective. I argue that these forms are instead the result of a recurring pattern of morphophonological change (EMERGENT MOBILITY) whereby erstwhile "acrostatic" formations develop intraparadigmatic stress mobility. In view of this alternative analysis, I contend that in (pre-)PIE neuter *-*r*/*n*-stems and athematic neuter nominals generally built oblique plural case-forms in the same way as animate nouns—i.e., by adding plural inflectional endings to the same stem (with the same prosodic properties) as in their corresponding oblique singular case-forms.

1. Introduction

This paper is concerned with the reconstructible word-prosodic properties (i.e., stress, ablaut) of Proto-Indo-European (PIE) neuter *-*r*/*n*-stems, their diachronic development, and their implications for IE nominal inflection. More specifically, it focuses on "simple" primary *-*r*/*n*-stems of the type in (1). This type is defined by two properties: (i) the neuter noun-forming derivational suffix appears to attach directly to a root (thus primary); (ii) this suffix contains just a single consonant (thus "simple"), **r* in nominative and accusative case-forms (NOM/ACC), and **n* in oblique (OBL) case-forms. According to the widely accepted Erlangen Model (EM),

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PIE *-*r*/*n*-stems of this type should be reconstructed with "acrostatic" (AS) inflection in their singular case-forms, hence fixed root stress, invariant zero-grade of the suffix, and intraparadigmatic alternations in the root vowel: **é* in NOM/ACC.SG, **é* in OBL.SG (AS I), as in (1a)–(b); or **ó* in NOM/ACC.SG, **é* in OBL.SG (AS II), as in (1c) (Schindler 1975a:4–6; cf. Weiss 2020:227, i.a.):[1]

(1)

		NOM/ACC.SG	OBL.SG	
a.	PIE	**h₁éśh₂-r̥*	**h₁ésh₂-n-*	'blood'
b.	PIE	**h₁yéḱʷ-r̥*	**h₁yékʷ-n-*	'liver'
c.	PIE	**wód-r̥*	**wéd-n-*	'water'

As recognized already by Schindler (1975a), however, the attested IE reflexes of (1) and other simple*-*r*/*n*-stems often show prosodic properties that are unexpected on the AS reconstruction. For instance, some reflexes of (1) in Vedic Sanskrit are given beside their corresponding AS pre-forms in (2), where it can be observed that all three forms show stressed inflectional endings rather than root stress; in addition, (2c) reflects zero-grade rather than full-grade of the root.

(2)

	Vedic				PIE	
a.	INS.SG	*as-n-áḿ*	'with blood'	≮	INS.SG	**h₁ésh₂-n-eh₁*
b.	ABL.SG	*yak-n-ás*	'from the liver'	≮	ABL.SG	**h₁yékʷ-n̥-s*
c.	GEN.SG	*ud-n-ás*	'of water'	≮	GEN.SG	**wéd-n̥-s*

Likewise, the Hittite reflexes of "simple" *-*r*/*n*-stems predominantly show stressed inflectional endings, as in (3), and in some cases also zero-grade of the root, e.g., in (3b).[2]

(3)

	Hittite				PIE	
a.	DAT/LOC.SG	*išḫanī* [isχ:-n-í:]	'for/in blood'	≮	DAT.SG	**h₁ésh₂-n-ei*
b.	GEN.SG	*uttanāš* [ut:-n-á:s]	'of the word'	≮	GEN.SG	**wéth₂-n̥-s*
c.	DAT/LOC.SG	*ḫaršanī* [χars:-n-í:]	'on the head'	≮	DAT.SG	**h₃érs-n-ei*

1 The Leiden Model's "proterodynamic" reconstruction of simple *-*r*/*n*-stems (see, e.g., Kloekhorst 2014 with references) faces the same challenges as EM's AS reconstruction—viz., the lack of a direct source for ending-stressed oblique case-forms (discussed just below)—but additionally fails to account for reconstructible root **ē*- and **o*-grades in this category, among other issues (see further §4 below).

2 On the phonological interpretation of oblique case-forms of Hittite *-*r*/*n*-stems like (3) see Yates 2021d.

In this paper, I propose a new diachronic account of simple *-*r*/*n*-stem OBL.SG forms with stressed inflectional endings of the type in (2)–(3). While my account aligns with Schindler's (1975a) traditional account (discussed in §2 below) in taking the AS reconstruction of this category in (1) as essentially correct, I diverge in deriving these OBL.SG IE case-forms directly from the corresponding cells of their AS paradigm rather than from those of a derivationally related "collective" paradigm. I argue that the innovation of inflectional stress in (2)–(3) is part of a broader phenomenon, first observed by Schindler (1972) in root nouns and termed here EMERGENT MOBILITY, whereby erstwhile AS categories tend to develop intraparadigmatic stress mobility over time.

The remainder of this paper is organized as follows. I begin in §2 by briefly reviewing Schindler's (1975a) account of OBL.SG forms like (2)–(3), then discuss some problems for this account. In view of these issues, I develop a new account in §§3–4: the mechanism proposed to drive prosodic change in these forms is introduced and empirically motivated in §3; it is then applied in §4 to outline an alternative prehistory for the diverse reflexes of simple *-*r*/*n*-stems in the IE languages. Finally, I conclude in §5 with an assessment of the broader implications of this proposal—in particular, for the inflection of neuter nominals in PIE and the grammatical status of the "collective." I also briefly discuss the nature and causes of emergent mobility, raising questions that must be addressed in future research.

2. On the "collective" as the source of ending-stress in *-*r*/*n*-stems in IE

According to Schindler's (1975a:3–4) influential hypothesis (building on Schmidt 1889), in PIE, neuter nouns lacked inflectional plural forms; these were therefore supplied by internally-derived "collectives," which were grammatically singular (thus employing singular endings in their oblique cases) and—if athematic—exhibited "amphikinetic" (AK) inflection (thus characterized by stressed full-grade of the root and *o-grade of the suffix in the NOM/ACC, and in the oblique cases by zero-grade of both root and suffix and stressed inflectional endings). Hence, e.g., the PIE word for 'water' would have had a partial paradigm like (4):

(4) PIE 'water'

	Singular (AS II)	"Plural" (= AK collective)
NOM/ACC	*wód-r̥	*wéd-or-h₂
GEN	*wéd-n̥-s	*ud-n-é/ós

On Schindler's account, GEN.SG Ved. *udnás* 'of water' in (2c) above does not directly continue the AS GEN.SG PIE *wéd-n̥-s in (5), but instead the genitive of

this AK collective, **ud-n-é/ós*, which was reanalyzed as the GEN.SG of NOM/ACC.SG **wód-r̥*, thereby replacing **wéd-n̥-s* in this function. More generally, his proposal provides a means for reconciling the ending-stressed IE OBL.SG forms in (2)–(3) above with the AS reconstruction of simple **-r/n*-stems in (1): they likewise phonologically continue oblique case-forms of AK collectives that have morphologically replaced their inherited AS OBL.SG counterparts, as in (5):

(5)

	IE singular					PIE collective	
a.	GEN	Ved.	*ud-n-ás*	'of water'	<	GEN	**ud-n-é/ós*
b.	ABL	Ved.	*yak-n-ás*	'from the liver'	<<	ABL	**$h_1$ik^w-n-é/ós*
c.	INS	Ved.	*as-n-ā́*	'with blood'	<	INS	**h_1(e)sh_2-n-éh_1*
d.	DAT/LOC	Hitt.	*išḫanī* [isχ:-n-í:]	'for/in blood'	<	DAT	**h_1(e)sh_2-n-éi*

Yet while Schindler's (1975a) account has won widespread acceptance (see Nussbaum 1986:161, Rieken 1999:296–302, i.a.; in standard handbooks, e.g., *NIL*: 712 n.37, Weiss 2020:278, Fritz and Meier-Brügger 2021:210), there are reasons to be skeptical—in particular, about the reconstructibility of the singular-marked oblique case-forms of the AK collective at the core of this explanation. In the first place, the evidential basis for their reconstruction is very limited. On Schindler's hypothesis, all athematic neuter nominals should have had their plural forms supplied by AK collectives in PIE, including "proterokinetic" (PK) deverbal neuter **-men-* and **-es*-stem nouns, which were highly productive and thus robustly attested in the daughter languages. One might therefore expect to find among the numerous attested reflexes of these categories some trace of the oblique stem of the AK collective. For instance, the same reanalysis that putatively yielded (5) could have led to OBL.SG forms of neuter **-men-* or **-es*-stem nouns with stressed endings (and root/suffixal zero-grade). Alternatively, the attested OBL.PL forms of these categories might show some hint of erstwhile AK inflection. The standard view among scholars who adopt Schindler's hypothesis is that the oblique forms of this originally singular collective paradigm were at some prehistoric stage "pluralized"—i.e., fitted out with plural inflectional endings found in animates (DAT.PL **-(b^{h}y)os*, GEN.PL **-oh$_1$/$_3$om*, etc.) on their way to becoming ordinary plurals in the IE languages synchronically (e.g., Jasanoff 2008:144–5). It would be unsurprising, then, if some of these OBL.PL forms preserved the stressed endings (and root/suffixal zero-grade) characteristic of AK nominals. Yet neither of these scenarios—laid out in (6)—finds any support in the IE data. There is no evidence for stressed oblique case-endings in neuter **-men-* or **-es*-stems, which show only root stress in Vedic and "recessive accent" in Greek, regularly accompanied by full-grade of

the root—e.g., GEN.SG/PL Ved. *bráhmaṇas*/*bráhmaṇām* ‘of the formulation/s’; INS.SG/GEN.PL Ved. *chándasā*/*chándasām* ‘with meter/of meters’; GEN.SG/PL Gk. χέυματος/χευμάτων ‘of the outpouring/s’, GEN.SG/PL Gk. ἔπεος/ἐπέων ‘of the word/s’.[3]

(6)

	PIE collective			Reanalyzed SG or renewed PL			IE
a.	GEN	*R(∅)-*s*-*é*/*ós*	>	GEN.SG	*R(∅)-*s*-*é*/*ós*	>	—
			>>	GEN.PL	*R(∅)-*s*-*óh₁/₃om*	>	—
b.	GEN	*R(∅)-*mn*-*é*/*ós*	>	GEN.SG	*R(∅)-*mn*-*é*/*ós*	>	—
			>>	GEN.PL	*R(∅)-*mn*-*óh₁/₃om*	>	—

The dearth of evidence for Schindler’s singular-marked AK oblique case-forms in neuter *-*men*- and *-*es*-stems is striking, but hardly anomalous. Outside of *-*r*/*n*-stems, it is difficult even to find alleged reflexes of these oblique case-forms, let alone compelling examples.[4] Empirically, then, the reconstruction of singular-marked AK oblique case-forms would appear to rest on *-*r*/*n*-stems alone.

Recent work on IE morphosyntax has raised further doubts about this reconstruction. Specifically, Melchert (2011, 2014) has challenged the traditional view that neuter collectives were at some historical stage grammatically singular. The main argument for this view is that neuter plural subjects (terminating in *-*(e)h₂*) regularly exhibit singular verb agreement in Greek and Anatolian, and on a more limited basis in Indo-Iranian as well. Its proponents interpret these verbal agreement patterns as a morphosyntactic archaism, a relic of their earlier status as singular collectives.[5] As observed by Melchert (2011:396), however, cross-

3 The mobility of neuter *-*men*- and *-*es*-stems in Balto-Slavic is broadly regarded as analogical; see Yates 2022:§4 on the former, and on the latter Jasanoff 2017:164 with references. On “recessive accent” as a reflex of root stress see again Yates 2022:§2.2 with references.

4 One such claim is made by Ringe (2017:94), who argues that the AS I paradigm of PIE ‘name’ was in Germanic replaced wholesale by the AK collective, hence that the attested OBL.SG forms of ‘name’ continue the SG-marked oblique forms of this collective. Yet as Ringe demonstrates, the actual Germanic outcomes of these forms reflect root full-grade and suffixal zero-grade, which are precisely the properties expected in the OBL.SG of the inherited AS I paradigm, and can thus be straightforwardly derived from this paradigm. In contrast, his own analysis requires the additional assumption that the root zero-grade in the oblique of the AK collective was analogically replaced by full-grade from the NOM/ACC, thereby unnecessarily complicating the diachrony.

5 On this type of analysis, the word-final *-*(e)h₂* observed in the NOM/ACC.SG would ultimately reflect **-*(e)h₂*-∅—viz., (theme vowel +) derivational suffix *-*h₂* + the phonologically null NOM/ACC.SG ending found in IE athematic neuters (see, e.g., Nussbaum 1986:129–33 for discussion).

linguistically low animacy nouns morphologically marked as plural often fail to trigger plural agreement on the verb; the apparent singular agreement observed with IE neuter plurals is thus plausibly analyzed as a "default" marking strategy used in the absence of a sufficiently animate controller, and so does not justify the assumption of erstwhile singular status for these neuter plurals (cf. Lundquist and Yates 2018:2092–3 with references). Melchert (2011:396–8) argues rather that the word-final *-*(e)h₂* in the NOM/ACC of these nouns was already in pre-PIE a plural inflectional ending used with neuter nominals, ultimately grammaticalized from a derivational suffix *-*h₂* that formed neuter *pluralia tantum* of the kind directly continued in Anatolian—e.g., NOM/ACC.PL Hitt. *warpa* 'enclosure' (< **w(o)rbʰeh₂)* ~ DAT/LOC.PL *warpaš* 'in the enclosure'. He therefore concludes "that these nouns were plurals from the very beginning and that they remained so in PIE" (2014:258).

If Melchert is correct, then the Schindlerian account in (5) of stressed OBL.SG endings in simple *-*r*/*n*-stems is excluded: the attested forms cannot continue the singular-marked oblique case-forms of a (pre-)PIE neuter collective, since such forms would never have been characterized by singular endings, but rather by plural endings "from the very beginning." The stress patterns observed in simple *-*r*/*n*-stems like (5) would thus require an alternative explanation. Yet even for scholars who reject Melchert's claim (e.g., Nussbaum 2014), the very limited empirical support for the singular-marked oblique case-forms of the AK collective should make it attractive to look for a different account of these stress patterns. All of the other IE evidence suggests that the "pluralization" of neuter collectives had occurred already in PIE and involved not just the replacement of its singular-looking oblique endings by ordinary plural endings but also remodeling of the oblique stem of the collective after the singular (cf. Nussbaum 1986:130). This contrasts strikingly with *-*r*/*n*-stems, where "pluralization" would necessarily be a post-PIE phenomenon: as will be shown in §4 below, there are clear cases in which the same simple *-*r*/*n*-stem has IE reflexes of the AS OBL.SG in addition to reflexes that have been attributed to the oblique stem of the AK collective; the former thus cannot have been replaced across the board by the latter already in PIE. Advocates of the Schindlerian account in (5) are therefore faced with a (thus far unaddressed) puzzle: why did the *-*r*/*n*-stems alone escape "pluralization" in PIE?

In the next two sections (§§3–4), I propose an alternative approach to ending-stress in the oblique case-forms of IE *-*r*/*n*-stems which obviates this question. I argue that these forms are instead the result of a recurring type of morphophonological change whereby intraparadigmatic stress mobility was introduced into inherited AS paradigms. Because this proposal makes no reference to the (singular-

marked oblique forms of the) AK collective, it is consistent with Melchert's (2011, 2014) hypothesis that neuter collectives were always grammatically plural.

3. Emergent mobility as an IE phenomenon

3.1. Recurring morphophonological change in IE "acrostatic" root nouns

In his influential treatment of IE root nouns, Schindler (1972:32–6) argued that AS types tend to undergo the series of step-wise diachronic developments in (7). As a result of these innovations, root nouns for which AS inflection can be (internally) reconstructed are often continued in the IE languages by synchronically mobile paradigms, viz., with stress alternations between root and inflectional endings.

(7) Recurring changes in IE root nouns per Schindler:

a. Renewal of athematic GEN.SG *-*s* by productive *-*e*/*os*.

b. Shift of stress in oblique cases from root to inflectional endings.

c. Unstressed root full-grade in oblique cases replaced by zero-grade.

In Schindler's view (1972:32), these developments are best illustrated by the PIE word for 'house', relevant IE reflexes of which are given in (8).[6] The root *-*o*-grade characteristic of the direct cases of an AS II nominal is reflected in Armenian (and likely too in Greek), while the *-*e*-grade of its oblique cases and archaic GEN.SG ending *-*s* are preserved in the fixed collocation **dém-s póti-* 'lord of the house', which is directly continued in Old Avestan and (univerbated) in Greek.

(8) Development of AS II 'house' in IE:

	ACC.SG	*dṓm	>	Arm. *tun*, Gk. δῶ 'house'
	GEN.SG	*dém-s	>	OAv. *dəṇg (paiti-)*, Gk. δεσ(πότης) '(lord) of the house'
>>	GEN.SG	*dm-é/ós	>	Arm. *tan*, YAv. *nəmō* 'of the house'

At some (post-)PIE stage, however, GEN.SG was renewed with the productive ending *-*e*/*os* (= (7a)); stress shifted onto *-*e*/*os* and the other oblique inflectional endings (= (7b)); and as a consequence of this stress shift the root */e/-vowel was

6 Schindler's (1975a:32) reconstruction is effectively *communis opinio*, appearing in most standard handbooks (Weiss 2020:219, 286; Fritz and Meier-Brügger 2021:221, i.a.). The long vowel in the ACC.SG results from Stang's Law (← */dóm-m/). Arm. *tan* must reflect a Lindeman-variant *[dm̥m-é/ós], which per Weiss (2017) is also continued in Old Irish. Weiss also argues that Old Irish inherited the *-*o*-grade of the direct cases, but does not preserve GEN.SG **dém-s*.

deleted (= (7c)), yielding the innovative root zero-grade that is found in oblique case-forms in Armenian and Younger Avestan. Change (7b) is not directly observed, but reasonably inferred from (7c).

Schindler (1972:33) saw a similar diachronic trajectory in the inherited word for 'foot' in (9) (cf. *NIL*:526–32). The root **o*-grade characteristic of original AS II inflection is well-supported by the comparative evidence, including direct reflexes of the expected ACC.SG in Vedic, Greek, and Armenian and of the ACC.PL in Hittite (PIE **pód-m̥s* 'feet' > Hitt. *pātu*[š] [pá:t-os]). The original oblique stem with stressed root full-grade (and GEN.SG **-s*) is not preserved, but it appears that this full-grade survived (7b) the introduction of stress mobility into the paradigm—surely already in PIE, in view of the convergence between Vedic, Greek, and Hittite (e.g., GEN.PL Gk. ποδῶν, Hitt. *patān* [pat-á:n] 'of the feet')—since an oblique stem **ped-ˊ* is continued in Vedic and Latin. Vedic thus perfectly reflects the root **o*/*e*-alternation expected in an AS II nominal: root *ā*-vocalism (< **o* via Brugmann's Law) in the direct cases, *ă*-vocalism in the oblique (< **e*).[7] Latin further shows another common development: the root vocalism of the oblique—in this case, full-grade—was leveled back to the direct cases (e.g., ACC.SG Lat. *pedem*).[8]

(9) Development of AS II 'foot' in IE:

	ACC.SG	**pód-m̥*	>	Ved. *pā́dam*, Gk. πόδα, Arm. *otn* 'foot'
	GEN.SG	**péd-s*	>	—
>>	GEN.SG	**ped-é*/*ós*	>	Ved. *padás*; Lat. *pedis* 'of the foot'

Schindler (1972:32–6) proposes a number of other AS root nouns that may have undergone (7) (cf. Weiss 2020:278–9), but here it will suffice to examine just one more example, the word for 'voice' in (10). Like 'foot', there are no attested reflexes of its original oblique stem, but its root full-grade was retained even when stress mobility was introduced into the paradigm (= (7b)) and is continued in Avestan (whereas Vedic and Greek have independently generalized **o*-vocalism

7 Greek and Armenian clearly exhibit leveling of root **o*-grade to the oblique cases in 'foot', but see van Beek (2018:338–40) for arguments that Greek also inherited full-grade in this context. He therefore concludes that the PIE paradigm of 'foot' was mobile with root **ó*/*e*-ablaut (contra Kloekhorst 2014:152–3), although he proposes a different pre-PIE starting point than Schindler (1972).

8 Per Schindler (1972:32) the inherited word for 'clan; settlement' (e.g., ACC.SG Ved. *víśam*) shows the same leveling, but since it developed oblique case-forms with zero-grade after stress shift (GEN.SG Ved. *viśás*), leveling yielded zero-grade in the direct cases as well, thereby eliminating the root **o*-grade characteristic of AS II inflection.

from the direct cases). The Avestan paradigm therefore shows that Indo-Iranian inherited the root **o*/*e*-alternation characteristic of AS II inflection.

(10) Development of AS II 'voice' in IE:

	ACC.SG	**wók^{w}-m̥*	>	OAv. *vācim*, Ved. *vā́cam*, Gk. ὄπα 'voice'
	GEN.SG	**wék^{w}-s*	>	—
>>	GEN.SG	**wek^{w}-é/ós*	>(>)	OAv. *vacō*; Ved. *vācás*, Gk. ὀπός 'of the voice'

A final point that must be addressed before proceeding is why the root full-grade of 'foot' and 'voice' in (9)–(10) persisted when stress shifted to the oblique cases, but 'house' in (8) developed an innovative root zero-grade. Schindler (1972: 35–6) proposes that stress shift in these lexemes occurred at "un état de langue, auquel le remplacement de *ER* inaccentué par *R*, mais plus celui de *(R)ET* par *(R̥)T*, était un procès vivant" (*R* = [+sonorant], *T* = [–sonorant]). In this conception, there was at some stage of the proto-language a regular phonological process whereby unstressed mid vowels were deleted;[9] but by the time (8)–(10) underwent stress shift, deletion had become restricted in such a way that it applied only to roots with a post-nuclear sonorant. The root in (8) thus develops an innovative zero-grade because it contains a post-nuclear sonorant (i.e., OBL **dém- >> *dm-ˊ*), but the roots in (9)–(10) retain full-grade because they do not (**péd– >> *ped-ˊ*; **wék^{w}- >> *wek^{w}-ˊ*). Since stress mobility in 'foot' in (9) is datable to PIE (as discussed just above), the restriction of deletion to roots of the shape *ER* must have developed prior to this stage.

If Schindler's hypothesis is correct, one should expect to find different outcomes in the IE languages in what appear to be identical phonological contexts: deletion of */e/ in *(R)ET* roots in formations like (11a) with originally stress-bearing inflectional endings or derivational suffixes (cf. 3SG.PRS.ACT Ved. *váṣṭi*, OAv. *vaštī* 'wants'); but non-deletion in erstwhile AS paradigms like (11b) (cf. (10) above), where the environment for deletion emerged only at a later historical stage.

(11) a. */we̯k-mé/ → [u̯k-mé] > Ved. *uśmási*, OAv. *us^{ə}mahī* 'we want'

b. */wek^{w}-é/ós/ → *[wek^{w}-é/ós] >(>) OAv. *vacō*; Ved. *vācás* 'of the voice'

In the next section, it will be demonstrated that Schindler's hypothesis also accounts for the behavior of other AS formations subject to stress shift. I will then

9 Such a process was later explicitly proposed by Schindler (1975b) for pre-PIE (see Lundquist and Yates 2018: 2133–7 for discussion).

turn to the IE reflexes of PIE *-*r*/*n*-stems in §4 and show that these likewise fit the profile of erstwhile AS nominals.

3.2. Recurring morphophonological change in other IE "acrostatic" formations

In Schindler's view (1972:35), the morphophonological changes in (7) frequently undergone by AS root nouns were not unique to this category; he suggested that they also affected other AS formations, such as animate *-*t*-stems.[10] Evidence for the same pattern in the verbal system had already been identified by Narten (1968), who reconstructed AS I-type *$\acute{e}$/*é*-root ablaut in certain IE root presents ("Narten presents"), e.g., of **steu*- 'praise' in (12) (cf. *LIV*²:600–1). In Indo-Iranian the SG.PRS.ACT forms continue root *$\acute{e}$-vocalism, but within its synchronic paradigm the corresponding plural forms with expected stressed full-grade of the root have been replaced by ending-stressed forms with zero-grade of the root (= (7b)–(c); cf. Jasanoff 2003:68–9, 2017:9). That this replacement occurred, very likely at a post-Proto-Indo-Iranian stage per Narten (1968:16–18), is suggested by traces of stressed full-grade of the root (i.e., *[stéw-]/*[stéu-]) in other "weak" prosodic contexts, e.g., PRS.ACT.PTCP OAv. *stauuat*-, MID Ved. *stávāna*- / YAv. *stauuana*-, and 1PL.PRS.MID YAv. *staomaide* (cf. 3SG Gk. στεῦται 'boasts').[11] The innovative root zero-grade is expected in a root with a post-nuclear sonorant (*/w/).

(12) Development of AS I root present to **steu*- 'praise' in IE:

	1SG.PRS.ACT	*stéu-mi	>	Ved. *stáumi*, OAv. *stāumī* 'I praise'
	1PL.PRS.ACT	*stéu-me(-)	>	—
>>	1PL.PRS.ACT	*stu-mé(-)	>	Ved. *stumási* 'we praise'

Subsequent scholarship has added further examples of the same pattern in other AS formations. Melchert (2010) implicates the recurring changes in (7) in the development of the neuter *s-stem 'mouth' in (13). The stressed root *o-grade in the direct cases characteristic of AS II inflection is continued in Anatolian, Latin, and elsewhere (see *NIL*:387).[12] In both Hittite and Vedic its oblique case-forms are

10 Schindler (1972:35) cites the Hittite word for 'flood' (NOM.SG *karaiz* < **ĝrói-t-s*) as an AS *-*t*-stem subject to (7a)–(c), but phonological and etymological difficulties leave this highly uncertain; see Rieken 1999:134–5, Vijūnas 2009:45–53, and Kloekhorst 2014:159.

11 In support of this chronology Narten (1968:15–18) points out that in Iranian weak full-grades begin to yield to zero-grades only in Younger Avestan (e.g., 2SG.IMP.ACT YAv. *stūⁱδi*) and even there are outnumbered by weak full-grades (e.g., 3SG.PRS.MID YAv. *staoⁱte*).

12 Per Melchert (2010:59) the Anatolian NOM/ACC.SG forms reflect PA **h₁óh₁-es* with epenthetic *[e] in the word-final consonant cluster.

uniformly ending-stressed; nevertheless, the original full-grade of the root was preserved (as expected in an *(R)ET* root) at least into Hittite, where only a pre-form **h_1eh_1-s-ˊ* can account for the (i) stressed inflectional endings; (ii) root [i]-vocalism (< **e* via pretonic raising); and (iii) stem-final geminate [sː] (< **Vh_1sV-* via assimilation) of its oblique case-forms (thus Melchert 2010:58–9).[13]

(13) Development of AS II ‘mouth’ in IE:

	ACC.SG	**$h_1$óh$_1$-s*	>	Hitt. *āiš* ([áːis]), CLuw. *āš* ([áːs]), Lat. *ōs* ‘mouth’
	OBL.SG	**$h_1$éh$_1$-s-*	>	—
>>	INS.SG	**h_1eh_1-s-éh$_1$*	>	Ved. *āsá́*, YAv. *å̊ŋha* ‘with the mouth’
>>	DAT.SG	**h_1eh_1-s-éi*	>	Hitt. *iššī* ([isːiːi]) ‘in the mouth’

The same set of changes can also be observed in the diachronic development of **h_2e*-conjugation root presents and aorists. Jasanoff (1978; 2003:71, 151; et alibi) reconstructs AS II **ó*/*é*-ablaut for these categories (see further Melchert 2013:138–41, contra Kloekhorst 2012), but synchronically the majority of Hittite radical *ḫi*-verbs instead show stress mobility within their NPST.ACT paradigm: root **ó*-vocalism is continued in the singular, while the corresponding plural forms reflect (“morphological”) zero-grade of the root and ending stress (see Yates 2017:121–4).[14] Both Jasanoff (2003:73–4) and Melchert (2013:143) attribute this situation to the recurring changes in (7). Meanwhile, in the Nuclear Indo-European (NIE) languages some of these **h_2e*-conjugation verbs were thematized, with generalization of either the root **ó*-vocalism of the singular or—crucially—the **é*-grade of the

13 Most of the IE evidence is consistent with generalized root **o*-grade in ‘mouth’; Indo-Iranian is also compatible with **e*-grade. The unambiguous reflex of root *[e] in Hittite rules out older reconstructions with root-initial or -final **h_3*. Melchert (2010:59) proposes that stress shift in ‘mouth’ had occurred already in PIE, but since Hittite reflects root *[e] rather than *[ə] (which is reconstructible for Proto-Anatolian in most “morphological zero-grade” contexts; see Yates 2021b and n.14 below), I suggest that mobility developed independently in Indo-Iranian and Anatolian—in the latter, just prior to the Hittite-specific raising of pretonic **e* (cf. §4.1).

14 Yates 2021b argues that (i) PA developed new stress-conditioned alternations between mid vowels (**ó*, **é*) and **ə* (> Hitt. *a*), the latter serving as a reduced allophone in “morphological zero-grade” contexts; and (ii) that these alternations are an important source of [áː] ~ [a-ˊ] ablaut in Hittite. For instance, when **h_2e*-conjugation radical verbs to roots of the shape **TeT* underwent emergent mobility, the root **e* vowel was retained and then reduced to **ə*—e.g., 3PL.PRS.ACT PIE **$b^hédh_2$-n̥ti* >> **b^hedh_2-énti* > PA **bəth$_2$-énti* > Hitt. *paddanzi* ‘dig’ (modifying Jasanoff 2003:77; cf. 3SG *paddai*). In the **m*-conjugation, Hittite *e*/*a*-ablauting radical verbs built to roots of the shape **h_1eT* reflect the same reduced vowel in weak contexts (e.g., 3PL.PRS.ACT PA **h_1əs-énti* > Hitt. *ašanzi* ‘are’).

present plural;[15] the latter type show that stress shift and root zero-grade were Anatolian innovations.

The broad takeaway from the nominal and verbal formations discussed in this section is that it is not just AS root nouns that tend to undergo the changes in (7) identified by Schindler (1972); these root nouns are rather part of a more general diachronic phenomenon that affected AS formations. I propose that the fundamental innovation underlying this phenomenon is EMERGENT MOBILITY, defined in (14):

(14) EMERGENT MOBILITY

> Stress shifts from the root to "weak" (= lexically accented) inflectional endings, with the result that paradigms with fixed root stress become mobile.

In §4 below I will argue that emergent mobility is responsible for the ending-stressed reflexes of the PIE simple *-*r*/*n*-stems in the IE languages.

4. Emergent mobility in Indo-European primary *-*r*/*n*-stems

In this section I outline a new diachronic account of the ending-stressed reflexes of PIE simple *-*r*/*n*-stems: of 'blood' in §4.1, of 'liver' in §4.2, of 'water' in §4.3, and of the remaining Hittite data in §4.4. In each case, I contend that the crucial innovation was emergent mobility in (14), and attempt to pin down its chronology as precisely as possible Finally, in §4.5 I compare this approach to the traditional account of these forms and argue that it is to be preferred on the grounds of parsimony.

4.1. Emergent mobility in PIE 'blood'

The PIE word for 'blood' in (1a) above has ending-stressed reflexes both in Anatolian and in the NIE languages—e.g., DAT/LOC.SG Hitt. *išḫanī* ([isχːn-íː]), GEN.SG *išḫanāš* ([isχːn-áːs]); ABL.SG Ved. *asnás*, INS.SG *asnā́*. On the basis of these facts one might project such ending-stressed singular forms back to PIE itself (thus Rieken 1999:302). However, there is evidence that AS I inflection was inherited into each of these branches, then altered by independent parallel prosodic innovations.

In Anatolian, there is no unambiguous evidence for NOM/ACC.SG PIE *$h_1\acute{e}sh_2$-$r̥$ with the lengthened-grade root characteristic of an AS I nominal. While this form

15 See Jasanoff 2003:64–90 for discussion and examples of the process. In some cases, these thematized *h_2e-conjugation verbs also have NIE reflexes with root zero-grade, which can likewise be attributed to *einzelsprachlich* emergent mobility.

could be reflected in Hitt. *ēšḫar* ([éːsχːar]), I assume rather the Proto-Anatolian (PA) paradigm in (15), in which GEN.SG *-*s* was renewed by *-*os* and the root vocalism of PIE OBL.SG **h₁ésh₂-n-* was leveled to the direct cases. This leveling produced NOM/ACC.SG PA **h₁ésh₂-r̥*, which yields both Hitt. *ēšḫar* and CLuw. *āšḫar* via regular sound change (whereas root **é* would have yielded [íː] in Luwian).

(15) Development of AS I 'blood' in Anatolian:

	ACC.SG	**h₁ésh₂-r̥*	>	Hitt. *ēšḫar* ([éːsχː-ar]), CLuw. *āšḫar(≠ša)* ([áːsχː-ar])
	GEN.SG	**h₁ésh₂-n-os*	>?	Hitt. *ēšnaš* ([éːsː-n-as])
>>	GEN.SG	**h₁esh₂-n-ós*	>	Hitt. *išḫanāš* ([isχː-n-áːs])

That Anatolian inherited the expected AS oblique stem **h₁ésh₂-n-* is corroborated by several pieces of evidence. The first is NOM/ACC Pal. *ēšḫa* 'blood' ([éːsχːa]), which is usually derived from NOM/ACC.PL ("collective") PIE **h₁ésh₂-ōr* with loss of word-final **r* after an unstressed vowel in PA (Melchert 1994:201; cf. *eDiAna*, s.v.).[16] This form is significant because in Hittite, neuter nouns with intraparadigmatic stress mobility always have suffixal stress in their NOM/ACC.PL (i.e., *-ār* [-áːr]; Yates 2021d). If the same holds for PA,[17] then root stress in the NOM/ACC.PL—which is crucial to the conditioning environment for **r*-loss—would imply root stress in the oblique cases as well. A second data-point is ANIM.NOM.SG CLuw. *āšḫanuwantiš* ([áːsχːan-want-is]) 'bloody', which is derived from the oblique stem of 'blood' with the possessive adjective-forming suffix *-*went*-. The cognate suffix in Vedic, -*vant*-, consistently attracts stress when its base exhibits intraparadigmatic stress mobility (e.g., *padvánt-* 'having feet'; cf. ACC.SG *pā́dam* ~ GEN *padás* in (9) above), but not when its base has stress fixed on the root (e.g., *áśman-vant-* 'stony'; cf. ACC.SG *áśmānam* 'stone' ~ GEN *áśnas*). If the suffix behaves likewise in Anatolian (the unmarked assumption), then the stressed root of CLuw. *āšḫanuwantiš* would imply that the (unattested) oblique cases of 'blood' also had root stress in Luwian—i.e., [áːsχː(a)n-]*, the regular reflex of PIE **h₁ésh₂-n-*. Third, there may be a direct reflex of **h₁ésh₂-n-os*, which per Schindler (1975a:6) is continued in Hitt. ⟨*e-eš-na-aš*⟩ (KBo 3.1 ii 47) with the same deletion of root-final **h₂* seen in Ved. *asnás* (cf. Melchert 1994:71); although

16 Tocharian also attests reflexes of NOM/ACC.PL PIE **h₁ésh₂-ōr*: NOM/ACC.SG TA *ysār*, B *yasar* (Schindler 1975:6).

17 See Yates 2021a and d for arguments that it held already in PIE.

the form is attested only in New Script in a manuscript that also contains *ḫ*-ful oblique forms, an archaism cannot be excluded.[18]

In early Hittite, however, the oblique case-forms of 'blood' are regularly stressed on their inflectional endings (cf. Kloekhorst 2008:258): GEN.SG *išḫanāš* occurs first in Old Script (KBo 17.1 iv 8), DAT/LOC.SG *išḫanī* in Middle Script (KBo 15.33 iii 31, OH).[19] I therefore propose that 'blood' underwent emergent mobility between PA and Hittite. Preservation of the root */e/-vowel is consistent with the inherited constraint against deletion in *(R)ET* roots. This root vowel was then subject to pretonic raising in pre-Hittite (**e* > Hitt. *i*; see Melchert 1994:139), whence the attested Hittite forms with root [i]-vocalism.

While Anatolian supports the reconstruction of AS inflection for 'blood' in PIE, the NIE languages provide crucial evidence for AS I inflection in particular. The diagnostic form is Gk. ἦαρ 'blood', which survives only in Hesychius (glossed 'αἶμα. ψυχή'). Otherwise, the NIE evidence is consistent with a similar diachronic trajectory, i.e., (16):

(16) Development of AS I 'blood' in NIE:

	ACC.SG	**h₁ḗsh₂-r̥*	>	Gk. ἦαρ 'blood' (Hsch.)
	OBL.SG	**h₁ésh₂-n-*	>>	(NOM/ACC.SG) Ved. *ásr̥k*, Gk. ἔαρ 'blood'
>>	GEN.SG	**h₁esh₂-n-ós*	>	Ved. *asnás* 'of blood'

In Vedic and elsewhere in Greek the NOM/ACC.SG historically reflects **é*, which can be explained via paradigm leveling from the inherited OBL.SG **h₁ésh₂-n-*. I suggest that 'blood' subsequently underwent emergent mobility—perhaps just prior to or within Indo-Iranian—whence ending-stressed Vedic forms like GEN.SG *asnás* and INS.SG *asnā́* (with deletion of **h₂*; see Rieken 1999:303 with references). As in Anatolian, non-deletion of root */e/ is predictable.[20]

18 Kloekhorst (2008:258) claims that the absence of *ḫ* is a scribal error.

19 Beginning in Middle Hittite oblique case-forms with initial stress appear (e.g., DAT/LOC.SG *ēšḫani* [é:sχ:-n-i]; KUB 45.47 iii 18, MH/MS), likely due to paradigm leveling from the direct cases. I view the suffixal plene spelling in hapax GEN.SG *išḫānaš* (KUB 17.18 ii 29, NS) as a scribal error (cf. Yates 2021d).

20 It has been suggested, however, that Lat. *sanguīs* 'blood' and *saniēs* 'ulcer' (see de Vaan 2008: 537–8 with references), as well as OLat. *asar* 'blood' (see Weiss 2020:55 n.9) reflect non-primary derivatives of the inherited word for 'blood' with root zero-grade **h₁sh₂-*. If correct, these derivatives would show that a proper root zero-grade was permissible in this lexeme at some stage of the proto-language.

4.2. Emergent mobility in PIE 'liver'

The reconstruction of an AS paradigm for 'liver' is supported by direct and indirect evidence, on which basis I assume the diachronic trajectory in (17):[21]

(17) Development of AS I 'liver' in IE:

	ACC.SG	**h₁yék^{w}-r̥*	>	Gk. ἦπαρ, YAv. *yākarə*$^{?}$ 'liver'
	OBL.SG	**h₁yék^{w}-n-*	>>	(GEN.SG) Gk. ἥπατος 'of the liver'
			>>	(NOM/ACC.SG) Ved. *yákr̥t*, Lat. *iecur*, CLuw. *ikkuwa*[*r*] ([íːkʷːar])
>>	ABL.SG	**h₁yek^{w}-n-ós*	>	Ved. *yaknás* 'from the liver'

AS I inflection is supported by NOM/ACC.SG Gk. ἦπαρ—and possibly also YAv. *yākarə*, although its linguistic reality is disputed by de Vaan (2003:68–9)—which point to root **é*-vocalism (cf. Weiss 2020:277). This paradigm was leveled in all branches: in Greek, by generalization of root **ḗ*-vocalism from the NOM/ACC.SG, and in the others, of **é*-vocalism from the oblique. The latter leveling accounts for the (stressed) full-grade continued in the NOM/ACC.SG of 'blood' in Vedic, elsewhere in Avestan, in Latin, and in Luwian (with geminate *-kku-* < unlenited **k^{w}*; cf. *eDiAna*, s.v.).

In Vedic, though, the synchronic paradigm of 'liver' is mobile, with ending-stress in its oblique case-forms: ABL.SG Ved. *yaknás*, INS.SG *yaknā́* 'with the liver'. I attribute these forms to emergent mobility.[22] Given the unambiguous reflexes of root **ē*-grade in Greek, this development is almost certainly an Indo-Iranian innovation, and if YAv. *yākarə* is real, necessarily post-Proto-Indo-Iranian. The preserved root full-grade is again consistent with Schindler's (1972:33–4) constraint against deletion when *(R)ET* roots undergo emergent mobility. In this respect, it improves on Schindler's (1975a:6) derivation of Ved. *yaknás* from an original AK collective (< GEN **h₁ik^{w}-n-é/ós*; cf. §2 above), which requires analogical leveling to account for the oblique root full-grade in Vedic.

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21 As discussed by Weiss (2020:257 n.7), the complicated Latin reflexes of 'liver' (e.g., GEN.PL *iocinerum*) can be explained starting from a paradigm with oblique **(h₁)yek^{w}-en-* (significantly, with root full-grade, not **o*-grade, contra Kloekhorst 2014:142–5). This can simply continue the inherited AS OBL.SG **h₁yék^{w}-n-* with generalization of suffixal full-grade from the endingless locative (also found in Germanic *-*r*/*n*-stems; cf. §4.3 below).

22 The plene spelling of the ERG.SG ending in CLuw. *ikkunānti*[*š*] (KUB 35.735.35 iii$^{?}$ 8; see Sasseville 2020:192–3, 563) may indicate that this ending is stressed (i.e., [ikʷːn-áːntis]); if so, it would appear that this lexeme has undergone emergent mobility in Anatolian as well.

4.3. Emergent mobility in PIE 'water'

In PIE the word for 'water' exhibited AS II inflection. This reconstruction is guaranteed by Anatolian, where its reflexes can be plausibly accounted for only starting from an AS II paradigm. The expected NOM/ACC.SG **wód-r̥* with root **ó*-vocalism is directly reflected in Hitt. *wātar* ([wá:t-ar]). The archaic INS Hitt. *witanda*/*wedanda* ([wí:t-an-t]) probably continues PA **wéd-n̥-d*,[23] with the stressed full-grade root and zero-grade suffix characteristic of AS oblique case-forms (cf. Melchert apud Ringe 2017:58). Per Schindler (1975a:7), however, the Hittite paradigm of 'water' was ultimately remodeled after 'fire', thus acquiring stressed full-grade of the suffix in its oblique case-forms—i.e., OBL.SG **wéd-n-* >> **wid-én-* > DAT.SG Hitt. *witēni* ([wit-é:n-i]; e.g., KUB 31.79 vs. 8′, MH/MS).[24] The mechanism for this prosodic change is lexical analogy rather than emergent mobility; but because both introduce stress mobility into originally immobile paradigms, they have similar consequences for newly unstressed root vowels—namely, non-deletion in *(R)ET* roots.

I propose that emergent mobility in 'water' was a common innovation of the NIE languages—thus, e.g., GEN.SG PIE **wéd-n̥-s* >> PNIE **wed-n-é*/*ós*, with predictable non-deletion of the root vowel just as in Anatolian.[25] The resulting para-

23 In Hittite (and several other Anatolian languages) **e* was raised to **i* between **w* and a coronal consonant (Melchert 1994:144–5); the resulting vowel is spelled variably [i] and [e] in Hittite, perhaps because the phonemic contrast was neutralized in this context. Kloekhorst (2019:144) assumes suffixal stress (i.e., [-án-t]), which cannot be ruled out synchronically, but a pre-form **-én-t* would have lost its final coronal stop, yielding Hitt. ˣ[-an] (cf. PTCP.N.NOM/ACC.SG Hitt. *-ăn* [-á:n] < **-ónt-*∅).

24 See further Yates 2021a. Kloekhorst (2008:987–8, 2019) instead reconstructs "proterodynamic" inflection for 'water', hence NOM/ACC.SG **wód-r̥*, OBL.SG **ud-én-*. Correctly observing that synchronically Hittite lacks intraparadigmatic ω[w ~ ω[u alternations, he proposes that the irregular inherited alternation in 'water' was repaired by epenthesizing "/i̯/" into the root in oblique case-forms. However, it is not credible that speakers would choose a "repair" that introduces a new irregularity (viz., an unparalleled alternation between [á:] and "[i]") in preference to an available repair that is actually regularizing: they could have generalized the root shape of the NOM/ACC.SG, yielding ω[wá:t- ~ ˣω[wat-′ with root [á:] ~ [a-′] ablaut, which is a well-established Hittite pattern both in the verbal system (see n.14 above) and in the nominal system (e.g., Hitt. *pāt-* [pá:t-] ~ *pat-* [pat-′] 'foot'; see §4.1 above). See also Melchert (2013:138–41), who shows that there is no independent evidence for "/i̯/" as distinct from /e/ or /i/. The actual root shape *wid-*/*wed-* thus has just one plausible historical source, an inherited root full-grade (contra Kloekhorst).

25 I assume that emergent mobility also involved a rightward stress shift in the NOM/ACC.PL of neuter nouns: **′-or-h₂* >> **-ór-h₂* (because the ending */′-h₂/ was preaccenting; see Yates 2021d). This hypothesis is supported by the fact—noted in §4.1 above—that all (and only) Hittite **-r*/*n-*

digm is nowhere attested as such; the NIE languages instead exhibit paradigms in which all case-forms reflect root *-*o*-grade (i.e., *-*wod*-) or zero-grade (*-*ud*-). To understand these forms it is necessary to briefly consider why roots of the shape *RET* in particular fail to undergo vowel deletion in the wake of emergent mobility. In his treatment of 'voice' in (10), Schindler (1972:33–4) suggests that *RET* roots exhibit full-grade because *samprasāraṇa*-type intraparadigmatic alternations were avoided. In other words, the regular application of deletion to unstressed root vowels was phonologically blocked when it would produce *samprasāraṇa*-type ablaut—in this case, alternations between word-initial *[w] in the direct cases and *[u] in the oblique.

I therefore propose that the newly-mobile PNIE paradigm of 'water' was unstable due to competing pressures in the oblique case-forms (and in the NOM/ACC.PL)—on the one hand, to delete root /e/ in a pretonic syllable (cf. Yates 2019); and on the other, to avoid intraparadigmatic $_{\omega}$[w ~ $_{\omega}$[u alternations. This paradigm was accordingly repaired in several different ways. In Germanic, the root *-*ó*-vocalism of NOM/ACC.SG *-*wód-r̥* spread throughout the paradigm—thus, e.g., GEN.SG PNIE *-*wed-n-é*/*ós* >> *-*wód-n-e*/*os* >> PGmc. *-*watenaz* (with analogical suffixal-full grade from the endingless locative; cf. Neri 2005:29–30) > Goth. *watins* 'of water'.

A different, more radical repair may be reflected in several NIE languages. I suggest that the competing pressures noted just above were resolved by allowing pretonic deletion of the root /e/ vowel but then analogically spreading the resulting zero-grade into the NOM/ACC.SG. These changes—represented in (18)—yielded a mobile paradigm with invariant root zero-grade *-*ud*- (i.e., with no *samprasāraṇa*-type ablaut).

(18) Radical remodeling of PNIE 'water'

ACC.SG	*-*wód-r̥*	>>	*-*úd-r̥*	>[?]	TB *war*, A *wär* 'water'
GEN.SG	*-*wed-n-é*/*ós*	>	*-*ud-n-é*/*ós*	>(>)	Ved. *udnás*; Gk. ὕδατος 'of water'

The oblique stem of this paradigm is directly continued in Vedic and likely also in Umbrian (ABL.SG Umb. **une**; cf. Weiss 2020:183), and with innovative *-*t*-stem inflection in Greek (ὕδατ- < *-*ud-n̥-t*-). The analogical NOM/ACC.SG could be reflected in Tocharian (see Kim 2018:146–7), but was morphologically replaced in Vedic, Umbrian, and Greek. In Vedic, 'water' has a suppletive paradigm in which

stems with stress mobility in the NOM/ACC.SG vis-à-vis oblique have suffixal stress (*-*ār* [-á:r] < *-*ór-h₂*), and also by Ved. *udā́* 'waters' (< *-*ór-h₂*) treated just below.

vā́r or *udakám* (< **ud-n̥-kó-*) serves as NOM/ACC.SG (see Lubotsky 2013).[26] In the latter two, the NOM/ACC.SG forms are Gk. ὕδωρ and Umb. **utur**; both can reflect the NOM/ACC.PL of the same paradigm, **ud-ṓr* (< **ud-ór-h₂*; cf. n.25), which is preserved as such in Ved. *udā́* 'waters'.[27]

Finally, there is the complicated evidence of the Balto-Slavic languages. As elsewhere in NIE, 'water' exhibits no root ablaut: in Lithuanian (OLith. *vánduo*, Lith. *vanduõ*) and in Slavic (e.g., OCS *voda*, Pol. *woda*) the synchronic paradigms are based on the **o*-grade root allomorph **wod-*, but in Latvian (*ûdèns*) and Old Prussian (*wunda(n)*/*unds*) on zero-grade **ud-*. How these forms should be analyzed is disputed, but according to Petit (2004:71–100) this mixture of root ablaut grades, the intrusive nasal in the root, and the initial [w] in OPr. *wundan* collectively point to a prehistoric ablauting paradigm with **wód-* in the direct cases and an oblique stem **ud-n-´*. I tentatively suggest that this paradigm arose in Proto-Balto-Slavic. Villanueva Svensson (2022) has called attention to the surprising number of verbs which can be reconstructed for Proto-Balto-Slavic with *samprasāraṇa*-type ablaut between present and aorist stems, although such ablaut is systematically eliminated in the attested Baltic and Slavic languages. In the context of this system, it seems plausible that the inherited constraint against *samprasāraṇa*-type intraparadigmatic ablaut was lost, thereby allowing for innovative deletion of the root mid vowel in the oblique cases of 'water'.

4.4. Emergent mobility in other Hittite *-r/n-*stems*

Most of the Hittite reflexes of simple **-r*/*n*-stems are attested with stressed inflectional endings. In addition to 'blood' (§4.1), this stress pattern can be observed in all of the nouns in (19):[28]

(19)	a.	'head'	DAT/LOC.SG	*ḫaršanī*	[χarsː-n-íː]
			ALL.SG	*ḫaraššanā*	[χarsː-n-áː]

26 But according to Lubotsky (2013:162) the Vedic paradigm is not historically suppletive, since Ved. *vā́r* (and CLuw. *wār*) continue **wóh₁-r̥*, itself ultimately a reflex of **wód-r̥* (via **d* > **h₁*).

27 This derivation is standard (see, e.g., Ringe 2017:308–9, Weiss 2020:278), though the historical source **ud-ṓr* is typically called a "collective" (cf. §2 above).

28 Examples (19b)–(c) also attest DAT/LOC.SG forms with suffixal plene—e.g., Hitt. *paddāni* ([patː-áːn-i]) 'in the basket' (KBo 17.4 iii 10). I assume such forms reflect endingless locatives (recharacterized with DAT/LOC.SG *-i*; cf. Rieken 1999:298), which regularly show suffixal stress in Hittite and Vedic paradigms in which other oblique case-forms are ending-stressed—e.g., Ved. *udán(i)* 'in the water' (~ GEN.SG *udnás*), Hitt. *tagān* ([takáːn]) 'on the earth' (~ GEN.SG *taknāš* [takn-áːs]). See further Yates 2021d.

b.	‘moment’	DAT/LOC.SG	*lamnī*	[lam-n-íː]
c.	‘basket’	DAT/LOC.SG	*paddanī*	[patː-n-íː]
d.	‘word’	GEN.SG	*uttanāš*	[utː-n-áːs]
		DAT/LOC.SG	*uddanī*	[utː-n-íː]

In the absence of extra-Anatolian comparanda, the reconstruction of these nouns at the PIE level is less secure. However, the available evidence is consistent with original AS II nominals that underwent emergent mobility at some point in the prehistory of Hittite. All of the NOM/ACC.SG forms of (19a)–(c) can reflect root **ó*-vocalism: *ḫaršar* (< **h₃órs-r̥*), *lammar* (< **nóm-r̥*), *pattar* (< **póth₂-r̥*).[29] In (19a)–(b) oblique case-forms like *ḫaršanī* and *lamnī* can be traced back to DAT.SG **h₃r̥s-n-éi* and **nm̥-n-éi* in which stress shift triggered root vowel deletion (<< **h₃érs-n-ei*, **ném-n-ei*).[30] In (19c) the root */e/ vowel was preserved, whence, e.g., DAT.SG **peth₂-n-éi* (<< **péth₂-n-ei*). This pre-form can account for Hitt. *paddanī*, either directly via PA **pəth₂-n-éi* (with reduced root vowel in a “morphological zero-grade” context; cf. n.14 above), or else with analogical *a*-root vocalism after NOM/ACC.SG *pattar*.

Example (19d) differs in that it reflects invariant zero-grade of the root (**uth₂-*; cf. Kloekhorst 2008:932–3). It thus may have undergone the same radical remodeling as ‘water’ in (18): deletion was permitted to apply in the weak cases (e.g., GEN.SG *uttanāš* < **uth₂-n-é/ós* < **weth₂-n-é/ós*), and the resulting root zero-grade was generalized to NOM/ACC.SG *uttar* ([útː-ar] < **úth₂-r̥* << **wéth₂-r̥/wóth₂-r̥*).[31] It should be noted, though, that the reconstruction of original AS inflection for (19d) is based purely on its identification as a simple primary *-*r*/*n*-stem.

4.5. Evaluating hypotheses: emergent mobility vs. AK “collective”

In §§4.1–4 I adduced evidence in support of the traditional reconstruction of original AS inflection for simple primary *-*r*/*n*-stems; and for ‘blood’ (§4.1), ‘liver’ (§4.2), and ‘water’ (§4.3) in particular, that this inflectional pattern still obtained in PIE and was maintained into one or more IE language branches. Each of these

29 See Rieken 1999:296–8 on (19b–c). On (19a) I follow Kloekhorst 2008:314–5 but reconstruct **o*-grade rather than full-grade (differently see Rieken 1999:310–11). The root etymology of (19c) is uncertain (cf. Kloekhorst 2008:660), but its shape is clearly *ET* and so non-deletion is predictable.

30 Arguably with some adjustment in consonantism after NOM/ACC.SG *ḫaršar* and *lammar*, depending on the (uncertain) outcome of **m̥* and **h₃* in these contexts (see Melchert 2020:264–6).

31 In the prehistory of Luwian the NOM/ACC.SG was rebuilt as **eut(h₂)-r̥* (> CLuw. *utarᵛša* ‘word, spell’) with a neo-full-grade (cf. Rieken 1999:299–302).

nouns then underwent a similar innovation, developing OBL.SG case-forms with stressed inflectional endings (and in some cases, root zero-grade) in place of their inherited forms with stressed full-grade of the root. Significantly, these innovations are in some cases relatively recent: stress shift in 'blood' is almost certainly post-PA, and in 'liver' very likely post-Proto-Indo-Iranian.

The traditional explanation of this change was critically examined in §2. Schindler's (1975a) account requires (i) that IE neuter nouns originally had their plural forms supplied by a collective stem, which had SG-marked oblique case-forms; and (ii) that at least for some *-*r*/*n*-stems these suppletive paradigms survived into the (sometimes shallow) prehistory of the IE languages, where the inherited OBL.SG case-forms were then ousted by the corresponding SG-looking case-forms of the formally singular, functionally plural collective. Melchert (2011, 2014) provides good reasons to doubt that such SG-marked collective oblique-case forms ever existed, but even if they did, it would be surprising if they were preserved in *-*r*/*n*-stems even as other neuter nouns were systematically "pluralized" in PIE. It would be still more remarkable if these anomalous *-*r*/*n*-stem paradigms were stably inherited into the individual IE language branches (e.g., in 'blood' for over a millennium into post-PA) and only then eliminated, either with replacement of the singular by erstwhile collective case-forms or with the total disappearance of these case-forms. Other indirect reflexes are conceivable—for instance, ending-stressed OBL.PL case-forms in an *-*r*/*n*-stem that does not develop ending-stressed OBL.SG case-forms—but unattested; instead, the OBL.PL forms of such *-*r*/*n*-stems consistently exhibit the same stress pattern and ablaut as their OBL.SG counterparts, e.g., GEN.SG Ved. *áhnas* ~ PL *áhnām* 'of the day/s' (cf. NOM/ACC.SG *áhar*); DAT/LOC.SG Hitt. *witēni* ([wit-éːn-i]) ~ PL *witenaš* ([wit-éːn-as]) 'in the water/s' (cf. §4.3 above).

Ultimately, it is not possible to rule out Schindler's (1975a) account. However, I contend that it is less economical than attributing this change to emergent mobility, as proposed above. On this analysis, the attested forms of *-*r*/*n*-stems can all be derived from PIE paradigms with OBL.PL case-forms that (i) are characterized by plural endings and (ii) have the same ablaut and stress pattern as the OBL.SG—viz., from paradigms just like those of other PIE neuter nouns. It thus avoids the need to assume that *-*r*/*n*-stems were morphologically exceptional at the PIE level, and only (much) later in the prehistory of the IE languages remodeled such that they inflect like ordinary neuters. At the same time, it also straightforwardly captures the fact that their OBL.SG and OBL.PL case-forms always pattern together formally in the IE languages. If an *-*r*/*n*-stem underwent emergent mobility, it developed ending-stress both in its OBL.SG and OBL.PL case-forms—e.g.,

DAT/LOC.SG Hitt. *uddanī* ([ut:-n-í:]) ~ PL *uddanāš* ([ut:-n-á:s]) 'to the word/s'. If its inherited AS stress was maintained, on the other hand, it is manifest both in its OBL.SG and OBL.PL case-forms—e.g., Ved. *áhnas* ~ PL *áhnām* 'of the day/s' (discussed just above). Finally, the proposed analysis requires no novel machinery. It is already widely accepted that AS root nouns were subject to emergent mobility (§3.1), and the same explanation has been extended to the AS verbs like (12) and to the overtly suffixed AS noun in (13) (§3.2). It is natural to assume that AS *-*r*/*n*-stems should be explained in the same way, since their prosodic development closely matches that of these other AS formations (viz., in terms of stress and root vocalism).

5. Conclusion

In this paper I have argued that the ending-stressed OBL.SG case-forms of simple neuter *-*r*/*n*-stems attested in the IE languages continue precisely what is expected on morphological grounds—i.e., inherited OBL.SG case-forms originally characterized by AS inflection—and owe their stressed inflectional endings to emergent mobility.

5.1. On the nature and causes of emergent mobility

If this analysis is correct, these *-*r*/*n*-stems (treated in §4) should be added to the other AS formations adduced in previous scholarship (collected and discussed in §3) as examples of emergent mobility. This robust and growing body of evidence suggests that there was a strong diachronic tendency for AS formations to undergo emergent mobility, in some cases already in PIE itself, and as such, naturally gives rise to a question: why does this prosodic change occur? In the oral version of this paper (Yates 2021c), I suggested that two factors were at work: (i) an ambiguity in the learning data specific to AS formations; and (ii) a preference for weak inflectional endings to bear stress in AS formations just as in mobile paradigms (i.e., interparadigmatic analogy). These are merely possibilities, however. Determining why emergent mobility occurs remains an important task for future research.

5.2. Consequences for the inflection of IE neuter nouns

It follows from the analysis advanced in this paper that the ending-stressed OBL.SG case-forms of the neuter *-*r*/*n*-stems examined in §4 have nothing to do with an AK collective (contra Schindler 1975a and much subsequent scholarship). This finding is significant, since as discussed in §2 these forms are almost uniquely cited

as direct reflexes of the SG-marked oblique case-forms of the AK collectives previously claimed (i) to supply plural forms for athematic neuter nominals lacking them and (ii) to be internally derived from their singular stem.[32] Without their support, I submit that there is insufficient evidence in the IE languages to reconstruct plural oblique-case forms characterized by AK inflection and singular inflectional endings for any neuter nouns at any historical stage. Instead, I suggest that these always had plural endings and were built to the same stem as their OBL.SG case-forms—thus, e.g., in PIE neuter *-*es*-stems GEN.SG/PL **´-es-e*/*os* / **´-es-oh$_{1/3}$om*; in neuter *-*men*-stems GEN.SG/PL **´-men-s* / **´-men-oh$_{1/3}$om*; and in simple *-*r*/*n*-stems GEN.SG/PL **´-n̥-s* / **´-n-oh$_{1/3}$om* (cf. §2 and §4.5 above). If this proposal is correct, athematic neuter nouns had ordinary non-suppletive paradigms in their NOM/ACC.SG and oblique case-forms. The reconstruction of suppletive AK collectives for such nominals would therefore depend wholly on how their NOM/ACC forms in *[-oːC] (< *-*oC-h$_2$*#) should be interpreted. I leave it to future research to determine whether alternative analyses of these forms are viable.[33]

References

van Beek, Lucien. 2018. Greek πέδιλον 'sandal' and the Origin of the *e*-grade in PIE 'foot'. In Lucien van Beek, Alwin Kloekhorst, Guus Kroonen, Michaël Peyrot, Tijmen Pronk and Michiel de Vaan (eds.), *Farnah: Indo-Iranian and Indo-European Studies in Honor of Sasha Lubotsky*, 335–49. Ann Arbor: Beech Stave.

eDiAna = Olav Hackstein, Jared Miller, Elisabeth Rieken, and Ilya Yakubovich (eds.). 2014–. *The Digital Philological-Etymological Dictionary of the Minor Anatolian Corpus Languages*. http://www.ediana.gwi.uni-muenchen.de (accessed 1 May 2022).

Jasanoff, Jay H. 1978. *Stative and Middle in Indo-European*. Innsbruck: Institut für Sprachwissenschaft der Universität Innsbruck.

———. 2003. *Hittite and the Indo-European Verb*. Oxford: Oxford University Press.

———. 2017. *The Prehistory of the Balto-Slavic Accent*. Leiden: Brill.

Kim, Ronald I. 2018. The Derivational History of Tocharian B *war*, A *wär* 'water'. In Dieter Gunkel, Stephanie W. Jamison, Angelo O. Mercado, and Kazuhiko Yoshida (eds.), *Vina Diem Celebrent: Studies in Linguistics and Philology in Honor of Brent Vine*, 141–51. Ann Arbor: Beech Stave.

32 One potentially relevant lexeme not discussed above is 'fire', a "complex" *-*r*/*n*-stem with PK inflection in SG (NOM/ACC.SG **péh$_2$-w̥r*, OBL **ph$_2$-wén*-). According to Schindler (1975a:10) its OBL.SG IE reflexes continue an AK collective, but see Yates 2019 for a possible alternative explanation.

33 See Yates 2021a and d for preliminary discussion.

Kloekhorst, Alwin. 2008. *Etymological Dictionary of the Hittite Inherited Lexicon*. Leiden: Brill.

———. 2012. Hittite "*ā*/*e*"-ablauting Verbs. In H. Craig Melchert (ed.), *The Indo-European Verb: Proceedings of the Conference of the Society for Indo-European Studies, Los Angeles 13–15 September 2010*, 151–60. Wiesbaden: Reichert.

———. 2014. The Proto-Indo-European Acrostatic Inflection Reconsidered. In Norbert Oettinger and Thomas Steer (eds.), *Das Nomen im Indogermanischen: Morphologie, Substantiv, versus Adjektiv, Kollektivum. Akten der Arbeitstagung der Indogermanischen Gesellschaft vom 14. bis 16. September 2011 in Erlangen*, 140–63. Wiesbaden: Reichert.

———. 2019. Hittite 'water'. In Uwe Bläsing, Jasmine Dum-Tragut, and Theo M. van Lint (eds.), *Armenian, Hittite, and Indo-European Studies: A Commemoration Volume for Jos J. S. Weitenberg*, 143–8. Louvain: Peeters.

*LIV*² = Helmut Rix and Martin J. Kümmel (eds.). 2001. *Lexikon der indogermanischen Verben: Die Wurzeln und ihre Primärstammbildungen*². Wiesbaden: Reichert.

Lubotsky, Alexander. 2013. The Vedic Paradigm for 'water'. In Adam Cooper, Jeremy Rau, and Michael Weiss (eds.), *Multi Nominis Grammaticus: Studies in Classical and Indo-European Linguistics in Honor of Alan J. Nussbaum on the Occasion of His Sixty-Fifth Birthday*, 159–64. Ann Arbor: Beech Stave.

Lundquist, Jesse, and Anthony D. Yates. 2018. The Morphology of Proto-Indo-European. In Jared S. Klein, Brian D. Joseph, and Matthias Fritz (eds.), *The Handbook of Comparative and Historical Indo-European Linguistics*, 2079–195. Berlin: de Gruyter.

Meier-Brügger, Michael, and Matthias Fritz. 2021. *Indogermanische Sprachwissenschaft*¹⁰. Berlin: de Gruyter.

Melchert, H. Craig. 1994. *Anatolian Historical Phonology*. Amsterdam: Rodopi.

———. 2010. The Word for 'mouth' in Hittite and Proto-Indo-European. *International Journal of Diachronic Linguistics and Linguistic Reconstruction* 7.55–63.

———. 2011. The PIE Collective Plural and the "τὰ ζῶα τρέχει rule". In Thomas Krisch and Thomas Lindner (eds.), *Indogermanistik und Linguistik im Dialog: Akten der XIII. Fachtagung der Indogermanischen Gesellschaft vom 21. bis 27. September 2008 in Salzburg*, 395–400. Wiesbaden: Reichert.

———. 2013. Ablaut Patterns in the Hittite *ḫi*-Conjugation. In Stephanie W. Jamison, H. Craig Melchert, and Brent Vine (eds.), *Proceedings of the 24th Annual UCLA Indo-European Conference, Los Angeles, 26–27 October 2012*, 137–50. Bremen: Hempen.

———. 2014. PIE *-*eh₂* as an "Individualizing" Suffix and the Feminine Gender. In Neri and Schuhmann 2014, 257–71.

———. 2020. Hittite Historical Phonology after 100 Years (and after 20 years). In Ronald Kim, Jana Mynářová, and Peter Pavúk (eds.), *Hrozný and Hittite: The First 100 Years. Prague, 11–14 November 2015*, 258–76. Leiden: Brill.

Narten, Johanna. 1968. Zum 'proterodynamischen' Wurzelpräsens. In J. C. Heesterman, G. H. Schokker, and V. I. Subramoniam (eds.), *Pratidānam: Indian, Iranian and Indo-*

European Studies Presented to Franciscus Bernardus Jacobus Kuiper on his Sixtieth Birthday, 9–19. The Hague: Mouton.

Neri, Sergio. 2005. Riflessioni sull'apofonia radicale di proto-germanico **namōn* 'nome'. *Historische Sprachforschung* 118.201–50.

Neri, Sergio, and Roland Schuhmann (eds.). 2014. *Studies on the Collective and Feminine in Indo-European from a Diachronic and Typological Perspective*. Leiden: Brill.

NIL = Dagmar S. Wodtko, Britta Sofie Irslinger, and Carolin Schneider (eds.). 2008. *Nomina im Indogermanischen Lexikon*. Heidelberg: Winter.

Nussbaum, Alan J. 1986. *Head and Horn in Indo-European*. Berlin: de Gruyter.

———. 2014. Feminine, Abstract, Collective, Neuter Plural: Some Remarks on Each (Expanded Handout). In Neri and Schuhmann 2014, 273–306.

Rieken, Elisabeth. 1999. *Untersuchungen zur nominalen Stammbildung des Hethitischen*. Wiesbaden: Harrassowitz.

Ringe, Donald. 2017. *From Proto-Indo-European to Proto-Germanic*². Oxford: Oxford University Press.

Sasseville, David. 2020. *Anatolian Verbal Stem Formation*. Leiden: Brill.

Schindler, Jochem. 1972. L'apophonie des noms-racines. *Bulletin de la Société de Linguistique de Paris* 67.31–8.

———. 1975a. L'apophonie des thèmes indo-européens en *-r/n-*. *Bulletin de la Société de Linguistique de Paris* 70.1–10.

———. 1975b. Zum Ablaut der neutralen *s*-Stämme des Indogermanischen. In Helmut Rix (ed.), *Flexion und Wortbildung. Akten der V. Fachtagung der Indogermanischen Gesellschaft, Regensburg, 9. bis. 14. September 1975*, 259–67. Wiesbaden: Reichert.

Schmidt, Johannes. 1889. *Die Pluralbildungen der indogermanischen Neutra*. Weimar: Böhlau.

de Vaan, Michiel. 2003. *The Avestan Vowels*. Leiden: Brill.

———. 2008. *Etymological Dictionary of Latin and the Other Italic Languages*. Leiden: Brill.

Vijūnas, Aurelijus. 2009. *The Indo-European Primary T-Stems*. Innsbruck: Institut für Sprachen und Literaturen der Universität Innsbruck.

Villanueva Svensson, Miguel. 2022. *Samprasāraṇa* Ablaut in the Balto-Slavic Verb. In Melanie Malzahn, Hannes A. Fellner, and Theresa-Susanna Illés (eds.), *Zurück zur Wurzel: Struktur, Funktion und Semantik der Wurzel im Indogermanischen. Akten der 15. Fachtagung der Indogermanischen Gesellschaft vom 13. bis 16. September 2016 in Wien*, 295–303. Wiesbaden: Reichert.

Weiss, Michael. 2017. The Paradigm of the Word for 'house, home' in Old Irish and Related Issues. *Indogermanische Forschungen* 122.61–82.

———. 2020. *Outline of the Historical and Comparative Grammar of Latin*². Ann Arbor: Beech Stave.

Yates, Anthony D. 2017. Lexical Accent in Cupeño, Hittite, and Indo-European. Ph.D. diss., University of California, Los Angeles.

———. 2019. Hittite *paḫḫweni*, Greek πυρί, and their Implications for Indo-European Ablaut. Paper presented 22 June at the 38th Annual East Coast Indo-European Conference, University of Pennsylvania. Handout available at http://www.adyates.com/research/.

———. 2021a. Indo-European Word-Prosody and the Impact of Anatolian. Paper presented 16 July at the Oxford Workshop on Indo-European Accentuation, University of Oxford. Handout available at http://www.adyates.com/research/.

———. 2021b. 'kill', 'cut', and the Restructuring of Root Ablaut in Anatolian Radical *-*mi*-Verbs. Lecture given 21 April at Cornell University. Slides available at http://www.adyates.com/research/.

———. 2021c. The Origin of Stress Mobility in Indo-European *-*r*/*n*-stems. Paper presented 5 November at the 32nd Annual UCLA Indo-European Conference, Los Angeles. Slides avalable at http://www.adyates.com/research/.

———. 2021d. The Synchronic and Diachronic Prosody of Hittite -*r*/*n*-stems. Paper presented 18 June at the 40th Annual East Coast Indo-European Conference, Cornell University and Virginia Tech. Slides available at http://www.adyates.com/research/.

———. 2022. A New Prosodic Reconstruction of Proto-Indo-European *-*mon*-Stems. *Indo-European Linguistics* 10.