Aspects of the Internal History of the PIE Verbal System

The comparative method affords us a detailed view of the sounds and forms of Proto-Indo-European (PIE) in its earliest phase. To learn about earlier stages in the development of the protolanguage we must resort to internal reconstruction, a technique which lacks the precision and accuracy of the comparative method. A result arrived at by internal reconstruction is fundamentally a hypothesis about how a particular configuration of linguistic facts might have come into being. Such a hypothesis may be an idle guess or an ambitious attempt to knit together a number of individually puzzling features; how well it succeeds depends, in the last analysis, on how much it explains in relation to how much it assumes. The possibility of drawing valid inferences about pre-PIE cannot be doubted in principle. Ved. āsī ‘you are’ and Gk. εἶ show that the 2sg. of the copula in late PIE was *hēsī; few scholars would question the general view that this form goes back to an earlier preform *hēs-ī. Similarly, the nom. sg. of certain r-stems ended in late PIE -er (cf. Gk. ἵππος ‘horse’, Gaul. duixīr, etc.), with lengthening but no overt case ending; most modern authorities would follow Szemerényi (1970:155) in tracing -er to a pre-PIE nom. sg. in *-er-s. More often than not, however, attempts to go beyond the comparative evidence lead to uncontrolled speculation. Pedersen’s projection of late PIE *deyə-, ‘god’ back to an alleged pre-PIE *deyəwó- (Pedersen 1931:290) was based on a very particular set of beliefs about the origin of the PIE ablaut system — beliefs which now seem dated and aprioristic to many scholars. The often-expressed view that pre-PIE was an “ergative” rather than a “nominative” language — an idea originally proposed by Vaillant (1936:93-108) — gives a neat account of certain inflectional peculiarities of late PIE, but only at the cost of assuming vast morphological and syntactic upheavals in the internal history of the protolanguage.

The present study is devoted to a problem that has long been a focus of pre-PIE speculation — the problem of the relationship of the perfect and middle. That the two categories are somehow connected is obvious from an inspection of the personal endings of the 1-3sg. and 3pl.:1

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1 The most spectacular achievement of internal reconstruction in IE studies, of course, remains Saussure’s 1878 deduction of the laryngeal theory. Laryngeals, however, cannot be described as a pre-PIE phenomenon, since they survived into late PIE and beyond.

2 Owing to the uncertainty that surrounds the form of the 1pl. and 2pl. in PIE, these endings will mostly be disregarded in what follows.
perfect  | middle  | active  
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>primary</td>
<td>secondary</td>
<td>primary</td>
</tr>
<tr>
<td>sg. 1</td>
<td>a*-he 3</td>
<td>a*-ge-r</td>
</tr>
<tr>
<td>2</td>
<td>a*the</td>
<td>a*-the-r</td>
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<tr>
<td>3</td>
<td>a*-e</td>
<td>a*-to-r</td>
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<tr>
<td>pl. 3</td>
<td>a*-er, a*-r(i)</td>
<td>a*-n-to-r</td>
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<td>a*-nro-r</td>
<td>?</td>
<td>a*-nro</td>
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These reconstructions incorporate the findings of Kurylowicz (1932) and Stang (1932), who first correctly described the structure of the middle endings and demonstrated their similarity to those of the perfect. A few details call for comment. In the perfect the 3pl. ending appears as a*-er in Lat. -ere (< a*-ere) and (probably) Hitt. -er, as a*-r in Av. -ar and OIr. -star (< *-orr), and as a*-s in Ved. -ub and GAv. -araś. As I have suggested elsewhere (cf. Jasanoff 1988a:71), this unusual allomorphy is best explained by assuming that the pre-PIE form of the ending was a*-er, formally parallel to the active 3pl. in a*-emt. The surface variant a*-er represents the phonologically regular reflex of accentuated full-grade a*-ers (cf. nom. sg. *phb-tér 'father' < *phb-tér-s), while a*-s and a*-r represent phonological and analogical treatments, respectively, of the corresponding zero grade.

In the middle the mark of the primary endings was a*-r, a particle unrelated to the ending of the 3pl. perfect but structurally parallel to the a*-i of the primary active endings. As for the desinences themselves, the 1sg. in a*-he, which is best preserved in Anatolian (cf. Hitt. -ha(r)i) and Indo-Iranian (c.f. Ved. -e), shows analogical forms with the substitution of -m for a*-he (< a*-h-) in Greek (cf. -ha, -tav) and Tocharian (A-mar, B-mar). Similarly, the 2sg. middle in a*-he, which retains its characteristic -e in Anatolian (Hitt. -tati), Tocharian (A-tār, B-tār), Celtic (Ofr. -ther) and Vedic Sanskrit (-tha), has introduced -e forms in Greek (-oas), Latin (-eae), Germanic (Go. -eas) and Iranian (Av. -eas, -eas; in dative -es). In the vocalism of the 3pl. middle, however, the differences are more far-reaching. The phonetic value of a*-he in later PIE, of course, was [bea].

3 In the interests of morphological clarity, laryngeal coloration is not indicated in these reconstructions. The phonetic value of a*-he in later PIE, of course, was [bea].

4 That a*-r, and not a*-ri, was originally obligatory in the present middle in Anatolian is demonstrated by Yoshida (1990). The Hittite 2sg. in -star contains the Anatolian reflexive particle *ta, substituted for a*-r(i) to avoid homophony with the 3sg. in -star(r) (cf. Melchert 1992:92).

5 The Tocharian class III subjunctives (type A phaṣṣā, B ḫeṣṭir 'will ripen' < *peṣṭoḥō, A ḫeṣṭā, B ḫeṣṭār 'will perish' < *peṣṭoḥō, etc.), which are intransitive and opposed to transitive active, are formally thematic middles with persistent o-color of the thematic vowel. The 3sg. in *-or represents earlier *-or, which contrasted with *-or (cf. B ḫaṣṣā < *peṣṭoḥō 'preserves') in pre-Tocharian.

6 Forms of the type huliiṣiṣ 'is called', iṣiṣ 'is put', etc. are not of course, built to thematic stems in *-e/o-, but to athematic stems in *-e/-.
forms in *-ye. Even in Old Irish, where primary thematic presents form t-less passives of the type *berair, *berar, old je/o- presents like gairid ‘calls’ and the weak verbs in *-e (< *-e/o-) and *-i (< *-e/o-) make their passives in -thir, -thar (‘gaithber, *morbar ‘is praised’, ‘leitcher ‘is left’). All this suggests that the 3sg. in *-to(t), and presumably also the 3pl. in *-nto(t), were originally analogical counterparts of *-o(r) and *-ro(r), typologically comparable to Gk. -ont and -on, albeit older. The locus of *-to(r) and *-nto(r) in the parent language was evidently in the je/o- and ke/o- presents, where, like *-o(r) and *-ro(r) in other pre-PIE stem classes, they had both middle and passive value. From here, still within the common period, they spread to other kinds of presents, but only in their middle, not their passive sense. Forms of the type *bheror, originally meaning both ‘bears (for) oneself’ and ‘is borne’, thus came to be represented by two slightly later daughter forms, *bheror ‘is borne’ and *bheror ‘bear (for) oneself (= Skt. bharate)’. The same process also gave rise to *steu-or ‘is praised’ vs. *steu-os ‘praises (for) oneself, rühmt sich, erwähnt’ and other athematic pairs. The ‘PIE stative’ was thus a more or less transitory effect of the replacement of *-o(r)/*ro(r) by *-to(r)/*nto(r) in certain stem classes. There is no evidence that it ever had a complete paradigm.

The fact of the relationship of the perfect and middle endings is self-evident, but the nature of this relationship is unclear. One obvious question centers about the origin of the contrast between the 3sg. perfect in *-e, with a vowel timbre that recurs in the corresponding 1sg. and 2sg. endings, and the 3sg. middle in *-o, with a timbre that recurs in the endings *-to, *-ro and *-nto. It has been suggested (e.g., by Cowgill (1968:25 ff.)) that the elements *-e and *-o were originally separate morphemes, representing the categories ‘perfect’ and ‘middle’, respectively. But it is also possible to maintain, with Kuryłowicz and Stang, that the difference between e- and o-timbre in the 3sg. is secondary, and that the perfect and middle endings were independently differentiated within PIE from a single original series. As we shall see in what follows, the latter scenario is not only more economical, it is also supported by a number of facts whose relevance to the problem has never been properly appreciated.

At the outset, it should be noted that the case for an original, pervasive contrast between e-vocalism in the perfect endings and o-vocalism in the middle endings is very weak. There is no evidence at all for a 1sg. middle in *bh2o or a 2sg. middle in *-th20; the attested languages all point to a-timbre, going back to e-timbre, in both the 1sg. and 2sg. (cf. above). By the same token, there is no evidence for a 3pl. perfect in *-ro, with e-timbre. The only PIE termination of the form *-roV was the 3pl. “stative” ending *-ro, which was evidently made by adding *-o, extracted from the other third person endings, to earlier *-r. This fact is important, because it establishes a terminus post quem for the creation of at least one middle ending: *-ro could only have come into existence after the phonological change of *-ero to *-er, and the subsequent (partial) analogical replacement of the zero-grade variant *-e by *-r. Other innovated endings were the 3sg. in *-to and 3pl. in *-nto, which, as we have seen above, were probably originally modernizations, proper to derived thematic presents, of *-o and *-ro, respectively. As far as the 1-3sg. and 3pl. are concerned, there are only two irreducible differences between the perfect and middle endings: 1) the middle endings, unlike the perfect endings, formed “primary” counterparts in *-e; and 2) the archaic 3sg. middle ended in *-o(r), while the 3sg. perfect ended in *-e.

The derivational history of the destinences *-ro, *-to and *-nto, together with the lack of a primary contrast in the perfect, suggest that the perfect and the perfect endings belong to a more archaic level of PIE morphology than the middle and the middle endings. Other facts point to the same conclusion. The consistent *o-zero ablaut pattern of the perfect is clearly an old feature (cf. *wot- > *wid- ‘know’, *memen- > *mem- ‘remember’, etc.); the classical middle, on the other hand, is conspicuous for its lack of paradigmatic ablaut (3sg. *kē- <> ‘lies’; pl. *kēi-ro, etc.). Less often noted is the fact that the distribution of the perfect endings is curiously defective. The modal forms of the perfect, for no apparent synchronic reason, take the active endings, a.o., e.g., in the 2sg. imperative *widēḇi (Ved. viyēbi, Gk. iēb) and the 3sg. optative *yid-jēḥ-t (Ved. vidyēk, Gk. εἰδέκιν (for *(f)ēk) or *(f)ēk) for which a form of the type *yid-jēḥ-e, with the corresponding perfect ending, might rather have been expected. It is significant, moreover, that the injunctive and preterite of the perfect ("pluperfect") take the active endings in Vedic (cf. 1sg. avamad ‘I knew’, 3sg. abēhet ‘feared’, etc.) and Gothic Avestan (erunaut ‘rejected’ < *erwand-t). That this was an Indo-European, rather than a purely Indo-Iranian, feature is shown by scattered forms elsewhere, notably Go. ni əgs ‘fear not!’ better taken

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7 A variant is the position of Rix (1988:110 ff.), who considers the *-o of *-to, *-nto, etc. a reflexive pronoun.

8 A similarly built *-oro, with *-o added to *-er, is evidently preserved in Gothic Avestan forms of the type aθkōθ ‘they sit’ (= Skt. aṣāt). The *-o of *-oro and *-ero is guaranteed by Toch. b sarn ‘sunt’, which probably represents unattested *sare < *sθθ-oro. Significant, the corresponding 3sg. is saro < *sθθ-oro.

9 The subjunctive of the perfect, of course, shows the usual thematic endings (Gk. eīn, eīoines, Ved. yētah, etc.).
from an injunctive *aŋb̥-s than from a subjunctive *aŋb̥-e-s, and Middle Hittite 3sg. *wevakta ‘asked for’ < *weyək-t, twice attested as the irregular preterite (for expected *wevakkis) of the inherited perfect *wevakkis < *weyək-e(e). We will return to the forms of this verb below.

The appearance of active morphology in the extended paradigm of the perfect underscores another “reticul” property of the perfect endings, namely, that unlike the endings of the middle, they have no identifiable synchronic meaning. The middle endings display a coherent range of “internal” or processual functions in the early IE languages — reflexive, reciprocal, self-benefactive, passive, etc. This characterization is possible because the middle endings, like the active endings, can be observed in combination with a wide variety of present and aorist stems, to which they impart a distinctive element of meaning. It is quite otherwise with the perfect endings, which are normally observed only in connection with the perfect itself. It is often asserted that the endings of the perfect were insinually stative, but this is inaccurate; the most that can be said is that stative meaning was a characteristic of verbal forms in which the perfect endings were combined with reduplication, *o : zero ablaut and hystero-kinetic accentuation. The non-indicative and non-present forms of the perfect, which took the active endings, were also semantically stative.

The functionally attenuated character of the perfect endings is apparent from other facts as well. Consider, for example, the position of thematic forms of the type Gk. φαβω, Lat. ferō, Go. bairen and Lith. vedō, which point to a PIE 1sg. *a-er- rather than *a-o-mi. From a formal point of view, the ending *a-er- is a shortened, almost completely apocopated, form of earlier *a-er-e, parallel to the *a-er- that appears in place of *o-er-e in the non-acc. dual of animate thematic nouns (cf. *yud̥-er-e ‘I know’: *aβ̥er-e, ‘I bear’, duplicating the pattern of *po-d̥-er-e ‘two feet’: *oγ̥er-e (two wolves)). Since the *a-er- < *a-o-er-e of *aβ̥er-e lacks the *er of the primary middle endings, it must be classed descriptively with the endings of the perfect series. But forms like *aβ̥er-e were neither perfect nor middle in PIE; they were unequivocally non-stative and active, contrasting with middles in *a-o-er-e (cf. Lat. -or-, OIr. -ur-; remodeled Ved. -e, Gk. -oματ, Go. -ada, etc.). Just as the preterite (pluperfect) corresponding to *yud̥-er-e ‘I know’ was *(e)γ̥er-e-m, ‘I knew’, with the active ending, the imperfect/instant correspnding to *aβ̥er-e was *(e)β̥er-e-m. The obvious inference is that the thematic 1sg. whatever its original value in pre-PIE (processual? intransitive?), was reinterpreted as an ordinary active form within the protolanguage itself. One may go further and speculate with Watkins (1969 passion) that the entire thematic active paradigm was once characterized by perfect-like endings; we shall have more to say about this possibility below. For the present, however, it should be noted that Watkins’ specific assumption of a 3sg. *β̥er-e ‘bears’, though perfectly plausible for an early stage of PIE, seems unlikely for the entire ancestor of the historical IE languages, where the comparative evidence points unambiguously to *β̥er-e.

A far more dramatic example of a category in which the perfect endings seem to have lost their etymological value and to have fallen together functionally with the active endings is the Hittite (and Anatolian) bi-conjugation. Verbs of this inflectional type show the endings -bhi (archaic -bhe), -tti and -i in the present singular, pointing to i-extended forms of the perfect endings *a-bh-e, *e-th-e and *e-e. bi-verbs display the same range of meanings as verbs of the mi-conjugation: some are transitive (e.g., ‘bite’, ‘put’, ‘renew’); some are intransitive (‘arrive’, ‘die’, ‘run’); some, but relatively few, are stative (‘know’, ‘see’). According to the standard view, the bi-conjugation is a direct descendant of the PIE perfect. The fullest treatment is by Eichner (1975/87 ff.), who assumes the following steps:

1) Certain inherited stative perfects (e.g., *(i)əj-sagb̥-bhe ‘ich bin einer Spur nachgegangen und habe in Erfahrung gebracht’ > ‘ich weiß’ (Lat. sediō)) added the particle *s when used in a specifically presential sense, thus leading to the establishment of present: preterite pairs of the type *sagb̥-hai (> sābha) ‘I know’ : *sagb̥-hā (> sābhin) ‘I knew’.

2) Other inherited perfects developed into (originally resultative) preterites (e.g., *ak-hā ‘I am dead, dēνν ω ‘> ‘I have died’ > ‘I died’), from which new analogical presents (‘ak-hai ‘I die’ ) were backformed in imitation of stative pairs like *sagb̥-hā : sagb̥-hā.

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10 A pluperfect of this type once existed in Greek as well; it is directly preserved in forms like Ipl. ἠδεύθην ‘we believed’, 3pl. ἠκλόθην (they knew) (with analogical *-er for *-b̥-) and 2pl. ἠκλίτην (they were). The regular pluperfect singular in -er, e.g., *-eb̥ is an inner-Greek innovation, as is the distinctive pluperfect of ‘know’ (2sg. ἠκλίτην, ἠκλίθην, 3sg. ἠκλίθην, etc.).

11 The reconstruction *a-er- (rather than *a-er-e) is assumed by the acute intonation of Lith. vedas and the bimoric *-o of Go. bairo and OHG birn. It is unlikely that *a-er- is simply the zero-grade of *a-er-e, since vowels in absolute auslaut seem not to have been affected by the inner-PIE rule of vowel deletion in unaccented syllables. The final sequence *-a-er-e sometimes appears as *-oh-er-e rather than *-oh-er-e, as in Ved. ṣravah beside ṣravah ‘two wolves’ and 3sg. ṣrānam ‘knows’ < *gaṇōdār-e (cf. also 1sg. jāvān < *gaṇādāh-bhe). Perhaps *-oh-er-e was the regular treatment when the preceding *-o- was accented, and complete apocope to *-oh was regular otherwise.

12 This would be true even under the theory that the thematic 1sg. was originally a subjunctive, as suggested to me by Klaus Strunk.
and, less immediately, mi-conjugation pairs like *ed-mi ‘I eat’: *ed-mi ‘I fast’.

3) The new conjugation in *-hāi was extended to a variety of stem-types that had no historical connection whatever with the perfect, such as the iteratives in -sī (e.g., *tāhī ‘I perform’), the *duratives* in -annat- (e.g., *yanahānī ‘I proceed’), and the factorables in -ahh- (e.g., *newahhā ‘I make new’).

This scenario is open to a number of objections, many of which were first pointed out by Cowgill (1975). The creation of presents from preterites — much less perfects — on the scale envisaged by Eichner is typologically unparalleled elsewhere in Indo-European, even in such innovative branches of the family as Germanic. The proposed etymology of šakkhi is unconvincing in general, the word equations linking hi-verbs, especially those with stative meaning, to old perfects elsewhere are few in number and of poor quality. Although the PIE perfect was normally reduplicated, reduplication plays only a subsidiary role in the hi-conjugation and is not found at all in the hi-verbs alleged to have extra-Anatolian cognates. Finally and crucially, the “perfect theory” fails to provide a principled explanation for why certain groups of inherited presents, such as the verbs in -sal- and -ahh-, consistently appear as hi-verbs in Anatolian, while others, such as the virtually synonymous types in -skh- and -mu-, remain in the mi-conjugation.

In fact, the best candidate for an inherited perfect in Hittite is not šakk- / šekk- ‘know’, but the exceptional hi-verb wewak-k- ‘ask for’. The underlying root is *tuek- ‘wish (for)’ (cf. Skt. vāyati also ‘orders’), Glk. ἔξωθ, Hitt. weker), which also forms a perfect (wewakš in Ved. Vedic. As we have seen above, the preterite of this verb is attested in Middle Hittite as 3sg. wewak-k- in a form difficult to motivate within Hittite but precisely comparable to the Indo-Iranian pluperfect type abibhet, wānumuṣ, etc.13 The pair wewak-k : wewakta, presupposing a late PIE */yēgōk- / wēgōk- ‘wish(es’: */yēgōk-t- ‘wished’),14 undercuts the perfect theory

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13 To be sure, the 3sg. ending -ta is regular in certain hi-verbs from the beginning of the Hittite tradition, notably those in stem-final -i (cf. akšāti ‘settled’, ḫaššu- ‘begat’, etc.). But -ta is extremely rare after stems in -k- in the older language, and the double attestation of wewakta in Middle Hittite is correspondingly striking. Oestinger’s comment on this form (p. 431, fn. 80) is inconsistent with his other statements about the distribution of -s and -ta.

14 The accent of Ved. 2sg. pres. wewakati shows that this form cannot go back to a present of the type 3sg. *yēgōk-t, as suggested by Oestinger. Rather, it is a back-formation from the corresponding pluperfect 2sg. *yēgōk-t, parallel to such forms as 2sg. mamāti (mad- ‘rejoices’), 3du. vrohtā (vyet- ‘encompasses’) and past-Rigvedic 3sg. bībhitā, on which see new Cardona (1992). The present wewakta is a modernization of wewakti with normalized accent and secondary t-reduplication (cf. śaikt ‘follows’ beside śākt ‘goes’ beside śākt ‘world’).
We may begin our survey of the main bhe-conjugation present types by considering the root "mēlh-" 'grind'.15 This verb forms a thematic present with variable root vocalism in most IE languages (cf. Go. mālan, Lith. malūs (o-grade), OIr. meid (e-grade), Lat. mōlō (o- or e-grade), MW māla, Arm. malēm (zero grade)). As seen by Meillet in 1916, these forms point to an athematic root present, as does the je/o-present that appears in Slavic (melyj). But o-grade is unknown in ordinary athematic paradigms, and the Hittite, where root presents in 1sg. -mi are generally well-preserved (cf. šēmi 'I am', šēmi 'I sleep', ĕpmi 'I grasp', etc.), here has a bi-verb (1sg. mallah'hi, 3sg. mallai, 3pl. mallazi). These facts suggest the following as the PIE paradigm:

<table>
<thead>
<tr>
<th>sg.</th>
<th>mlēh-hē</th>
<th>1 'grind'</th>
<th>mlēh-me</th>
<th>(vel. sim.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>mlēh-thē</td>
<td></td>
<td>mlēh-te</td>
<td>(vel. sim.)</td>
</tr>
<tr>
<td>3</td>
<td>mlēh-e</td>
<td></td>
<td>mlēh-t(i)</td>
<td></td>
</tr>
</tbody>
</table>

The individual languages simplified this pattern in different ways. Hittite added the -i of the bi et nunc and replaced the plural endings with those of the mi-conjugation; later, the syncretic stem malla- (occasionally still mahl-) was extracted from the 3pl. mallanzi < *mlēh(i) and leveled through the rest of the paradigm. Most of the other languages generalized the o- or e-grade variant of the root before adopting thematic inflection. The zero grade of Welsh and Armenian may be analogical (cf. Ved. 3pl. suvātī for *suwāti < *sēuyt-iti, etc.) or may have originated in a 2sg. impv. *mlēh-ō, the evidence for which, inconclusive at best, will not be discussed here.

There were other "mōlō-presents" in late PIE, with reflexes generally recognizable by their o- or e-vocalism, simple thematic or je/o-inflation outside Anatolian, and — in the most interesting cases — bi-inflation in Hittite. Some of the clearer examples are the following:

*ēkonk- / ūkonk- 'hang (tr.); cf. Go. haban, -ep (tr.), also -ep (intr.) < 3sg. mīl. *ē-ā + *ē-p ; Ved. ēsukate 'hesitates'; OH kāndi : kankanzi (tr.), later middle gangattari (intr.)

The number of cognate sets is not large; the type was clearly recessive outside Anatolian, Germanic and Balto-Slavic. Since an unusually high proportion of the o-grade presents found around the family are verbs of motion or "violent activity," it is tempting to assign Hittite bi-verbs like harara- 'crush', šēkar- 'implant' and ākē- 'cut up' to this class as well.17 But not all root verbs of the bi-conjugation go back to mōlō-presents; cf. below.

The paradigm given above is to a certain extent an "ideal" one; that is, it assumes that the analogical changes which led to the reentrenchment and gradual elimination of the bhe-conjugation in the IE daughter languages were entirely a development of the post-IE period. This assumption, of course, is not necessarily warranted. It is quite conceivable, for example, that the 3pl. *mēlh-t(i) had already been specialized as an imperfect/injunctive in the parent language, having been ousted from its role as a "true" present by an innovated mi-form of the type *mēlh-ti. Or again, the 3sg. *mēlh-e 'grinds' could very well have been equipped with an analogical imperfect: *mēlh-et, with added -et, before the end of the common period.18 Such remodelings, though not directly verifiable,

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15 The reconstruction with "-h" is suggested by Luv. (mem)mlēh-; cf. Melchert (1993: 132, 134). "-b" is also possible, but not *mlēh-; the medial -e- of Myc. me-re-ri-reja "μέθρεται" must have assimilated from earlier *-ē- or *-o-.

16 Since the conditions under which "-e" became -ē- in Hittite are not exactly known, it is difficult to tell in individual cases whether a given Hittite "weak" stem with a-vocalism, such as kānk-, is phonologically regular or analogical. "-e" is only rarely preserved, a probable instance being the 3pl. karip(pan)i (3sg. karipū; cf. below).

17 For a general discussion of o-grade presents see Hirtzsche (1963), who, however, considers the type to have been originally thematic.

18 We are not well informed about the late PIE shape of the 3sg. pretetere of the bhe-conjugation, since Hittite has everywhere generalized -i < *-ē-, originally proper only to a small subset of bi-verbs of etymic origin (see below). The pre-Hittite 3sg. pretetere corresponding to the present *mēlh-ēi should theoretically have been *mēlhe-ē, without the -i of the bi et nunc. The assumption of an inner-IE remodelling of *mēlh-ē to *mēlh-ēi (cf. "would have added" to *mēlh-ēi) would have two advantages: 1) it would help to account for the family-wide tendency of bhe-conjugation verbs to become thematic outside Anatolian, and 2) it would provide a direct explanation for the attested Hittite 3sg. pret. mallei and its apparently back-formed present mallezi. Few bi-verbs, however, give direct evidence for a pretetere in "-ēi."
would simply have anticipated the general direction of drift in the later languages.

Another class of PIE *bho-conjugation presents is represented in Hittite by the type *dēb₂h₂- (PIE *dēb₂h₂-). It is impossible to separate the i-element in these forms from the thematic *i-e/o- that frequently characterizes the presents of “long-vowel” roots outside Anatolian. The parent language appears to have had two classes of athematic i-presents:

I. sg. act. 1 *dëb₂h₂-i-heh ‘I suck’ 2 *dëb₂h₂-i-me 3 *dëb₂h₂-i-té 3 *dëb₂h₂-i-dr

mid. 3 *dëb₂h₂-i-ôr

II. sg. act. 1 *spëb₂h₂-i-heh ‘I thrive’ 1 *spëb₂h₂-i-me 2 *spëb₂h₂-i-te 3 *spëb₂h₂-i-ôr

mid. 3 *spëb₂h₂-i-or

Representative PIE stems of type I were *mi(ē)h₂-i- ‘entwine’, *pe(ē)b₂h₂-i- ‘fly, fall’, *d(ē)b₂h₂-i- ‘bind’, *d(ē)b₂h₂-i- ‘divide’ and *k(ē)b₂h₂-i- ‘acquire’. Representative of type II were *mëb₂h₂-i- ‘spin’ and *lëb₂h₂-i- ‘cry’.

Types I and II fell together in Hittite, where i-presents became productive. Hitt. 3sg. dëi — itself an illustration of this productivity — is regular for *dei (vel sim.) < *dëb₂h₂-i-ôr. 2sg. dei reflects the anticonsonantal stem *dëb₂h₂-i-.

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Roots in *-h₂- regularly lost their laryngeal before *-j- and eliminated it analogically elsewhere (cf., e.g., 3sg. ispat < *spëb₂h₂-i-ôr, 2sg. ispat for *ispati < *spëb₂h₂-i-ôr). Most of the other branches of the family developed thematic presents of the form *C(C)V-i-e/o- from both types I and II (cf. Lat. uici, uic, OHG täm ‘suckle’, spauen ‘succeed’, etc.); type II, however, is sometimes detectable from language-to-language differences in vocalism, as, e.g., in the case of Balto-Slavic *spiejo/o- (Lat. spēne ‘I am fast enough’, OCS spějo ‘I succeed’ < *spēb₂h₂-i-ôr).

21 The creation of *spiejo, *skřejo, etc. in the third person may have been influenced by the corresponding 1sg. forms *spējoi, *skřejoi, etc. (< *spēb₂h₂i-ôr, *skřejoi), which arose from *dëb₂h₂-i-ôr, *këb₂h₂-i-ôr, etc. by an inner-PIE rule that reduced sequences of the form *-AH₂HA- to *-AH₂A-.

22 Compare the development of underlying *dëb₂h₂i-ôr to Ved. *dydh₂-i-ôr and OCS *spëjo (i.e., *spēj₂i-ôr + *H₂-i) in the instrumental singular of feminine 2-stems.

The difference in treatment between *skřejoi and *spiejo is secondary, the *-i- of *skřejoi having been restored from the root *skrö- < *spëb₂h₂-i-ôr (cf. also *spëb₂h₂-i-ôr)
a stem-final sequence *-eh₂-e-o/ (>*-ax-*) which was generally confused — phonologically or morphologically — with the outcome of *-eh₂-e-o/ (>*-ax-o-*). The "correct" reflex of *-eh₂-e-o/ is perhaps to be seen in the Baltic present type in *-ax-, with circumflex intonation (cf. Lith. 3p. stātō 'build(s)'< *stāt-eh₂-s управа 'make *stāt-eh₂-s'). Still other comparisons suggest themselves — e.g., of the Hittite type tarna- 'release' (3sg. -ai) with the presents in *-ne-o/ of the non-Anatolian languages, and of the Hittite type ḫubu- 'pour' (3sg. -waṣṣax) with the traditionally recognized present actives in *-ya-o/ and middles in *-u- (cf. Ved. ḫrswat 'overcomes', mid. tarnte). In principle, the ḫ-e-conjugation theory provides a mechanism for explaining such correspondences; the perfect theory does not.

We are now in a position to return to the problem of the relationship of the perfect and middle endings. If the foregoing account of the ḫi-conjugation is correct, then the perfect endings — the term is a misnomer, but a convenient one — had no specifically static value in late PIE. Indeed, they had no specific value distinct from the active endings at all; from a synchronic point of view they were mere morphological variants of the active endings, like strong preterites beside weak preterites in modern English or German. But this situation cannot have been original. The similarity of the perfect and middle endings suggests a common origin and a shared range of primitive functions — functions which were retained and/or specialized in the case of the formally innovative middle endings but weakened and lost in the case of the marginalized endings of the perfect.

It therefore seems reasonable to speculate that pre-PIE once had a single "protomiddle" set of endings, which outwardly resembled the endings of the later perfect and ḫ-e-conjugation more closely than those of the later middle. The functions of the protomiddle endings were broadly similar to those of the middle proper: representative 3sg. forms might have included *kē-ē lies, *kē-ē yields, *memō-ē holds in mind, *kōnk-ē hangs (intr.) and *ēbēj-ē sucks. One respect in which the protomiddle differed from the classical middle, however, was that certain activities involving motion — either motion from place to place or motion incident to a repeated or vigorous action — were conceived of as processer and hence represented by protomiddle rather than by active forms. Early PIE thus also had, e.g., such 3sg. protomiddles as *molēb-ē 'grinds (away at)' and *bēhr-ē 'bears.26 In the course of time various devices were found to reinforce the middle-like value of some, but not 26 The processual interpretation of *bēhr-ē and other thematic presents of motion and conveyance was first proposed by Hollfield (1977).
Aspects of the Internal History of PIE Verbal System

The late PIE verbal system evidently included aorists of the type *h₃or-/*h₃er-/*log-/*leg-, etc., which inflected like presents of the *molyh-/ *molhy- class. In pre-Hittite, inherited preterites like *av-ba 'I arrived' and *lag-ba 'I lay down' were equipped with presents *av-bai and *lag-bai, respectively, which yielded Hitt. arbi and *lk̂bu. The transitive meaning of lag- is a consequence of its semantic polarization with the "true" middle lagū-ti 'is bent'.

Traces of 5-grade aorists are comparatively rare in the non- Anatolian languages, in part because they were commonly remade as ordinary middle with "weak" vocalism (cf. Ved. ātra (ptic. ārona-) = *h₄or-tō, Gk. λύω, 5-grade is exceptionally retained in ὅποτο). Buto-grade is systematically reflected in two post-IE categories: 1) the Indo-Iranian intransitive ("passive") aorist in 3sg. -i (e.g., udhūhī 'awoke', āroci 'shone forth', ἀπαί 'went', etc.); and 2) the Tocharian A intransitive middle preterites nakāt 'perished', ṭakāt 'ripened', ṭisakāt 'burned (intr.)' and lyokāt (for lōkāt; cf. Toch. B latkašat) 'shone forth'. Although both Indo-Iranian and Tocharian have replaced the original be-conjugation 3sg. in *-ed by a new ending, it is hard to escape the conclusion that Ved. āroci and CToch. lauktec (≠ *laun-ko-) constitute a significant word equation.

The fact that āroci and lyokāt are intransitive and paradigmatically isolated is not accidental. The aorist 3sg. in *-ed had a special history in the protolanguage, as can be seen by following the fortunes of the root *nek- 'perish, destroy'. The pre-PIE protomiddle aorist *nek-/nek- (sg. *nek-h₂, *nek-h₃, *nek-me, *-i, *-i, *-t-i) was no doubt originally intransitive and had the meaning 'perished'.

As many present protomiddles, however, this aorist gave rise to two daughter paradigms in late PIE — a formally renewed "true" middle, to which the intransitive sense naturally attached itself; and a functionally denatured be-conjugation active, which became, by opposition to the middle, transitive. For the most part, the formal differentiation of the new active and middle paradigms proceeded along predictable lines. The plural of the middle took on the productive middle endings: 1pl. *nek-modh₂ 'we perished' and 3pl. *nek-ro 'they perished' henceforth contrasted with

27 Here, as in presents of the kēnti: kananzi type, there has been evident extension of a "morphological" zero grade in -s (cf. note 16). Weak present forms of the type 3pl. lagānzi and āņānzi are inseparable from mi-conjugation forms of the type appusti (they've set it) and anānzi (they are; they probably owe their origin to a proportion of the type āppur, āṣī: *appar-ū, āṣī: *appar-ū, X = lagānzi, anānzi).

28 Or — conceivable at this early stage — it was inalienable, with the meanings 'perished' and 'destroyed'. The forms quoted for the 1pl. and 2pl. endings are purely formulaic.
older 1pl. *nēk-me 'we destroyed' and 3pl. *nēk-t(ə) 'they destroyed'. The active:middle contrast was likewise introduced into the 1sg. and 2sg.; here, however, the middle and *he*-conjugation endings were identical, and the difference between the two diatheses was simply expressed by the difference in vocalism between 1sg. *nēk-he and 2sg. *nēk-θhe, which were active, and 1sg. *nēk-he and 2sg. *nēk-θhe, with leveled "weak" vocalism, which were middle. Against the background of these changes, it might have been expected that the inherited 3sg. *nēk-e would be assigned to the active paradigm, and that a new middle *nēk-(tə) parallel to *nēk-he and *nēk-θhe, would be created within PIE to express the meaning 'perished'. But events took a different course. The evidence shows that the 3sg. *nēk-e was assigned to the emergent middle paradigm; to express the sense 'destroyed', a wholly suppletive form, originally the imperfect of a sinitic present with "Narten" ablaut, was appropriated from the present system.29 The result was that *nēk-he 'I destroyed' and *nēk-θhe 'you destroyed' acquired an utterly unrelated form — *nēk-s-t — as their 3sg. counterpart, while the inherited 3sg. *nēk-e survived with its o-grade intact in an otherwise "normal" intransitive middle paradigm. In post-IE times, forms of the type *nēk-s-t became the source of the classical s-aorist, while forms of the type *nēk-e became the source of the Vedic "passive" aorist ávoca and the Tocharian A intransitive type lyōkait, nakait, etc.

The subsequent evolution of the s-aorist has been described elsewhere (cf. Jasanoff (1988a)). Starting from a few inherited forms like 3sg. naaśi 'turned (tr.)', led < *nēit-s-t (= Ved. ánāit), Hittite generalized the 3sg. in *s-t to all *he-conjugation preterites. It did not, however, systematically extend the s-element from the 3sg. to the rest of the paradigm, which thus retained its *he-conjugation inflection (1sg. nēthum, 2sg. nūtta, etc.). Tocharian, like Hittite, confined *s- to the 3sg. in the active (cf. B 3sg. nekṣa, but 1sg. nekwa, 3pl. nekar, etc.). But, unlike Hittite, developed a fully sinitic middle paradigm in verbs other than lyōk-, nāk-, etc. The other IE languages went still further, extending the *s- of the 3sg. to all persons and numbers of the active as well as the middle. In this way they generated the familiar s-aorist of the handbooks — and in the process eliminated most of the non-Anatolian evidence for the *he-conjugation root aorist. The history of the sinitic aorist has important consequences for IE dialectology: it furnishes the strongest evidence available for the view that Anatolian was the first branch of IE to part company from the other dialects, and that Tocharian was the second.

As remarked earlier, historical conclusions arrived at by internal re-construction are usually less reliable than those arrived at by linguistic comparison. That generalization, as far as it goes, certainly holds true in the present case: the explanations proposed above for, e.g., the genesis of the 3pl. ending *s-ro, the origin of the *s-: *s-o contrast in the perfect and middle, and the etymology of the s-aorist 3sg. in *s-t, are only guesses, albeit educated ones. For the most part, however, the results presented here are based on the comparative method. To the extent that our picture of the PIE verbal system differs from the familiar Neogrammarian model, it is not because we have indulged in excessive glottochronic speculation, but because we have tried to take the evidence of Hittite, and to a lesser extent Tocharian, on its own terms. Our central claim — that the PIE "perfect" endings were used in many ways unconnected with the perfect proper — is an inference from the facts of Anatolian taken together with the facts of the other IE languages. It is a claim that can be falsified in principle, and that will be falsified in fact and when a simpler account of the same evidence is provided. Meanwhile, this much is clear: we will never be able to form a balanced view of Anatolian, or an unbiased assessment of its most idiosyncratic features, if we insist on re-constructing PIE on the basis of the non-Anatolian languages alone. Students of IE phonology recognized that long ago; students of IE morphology would be well advised to do the same.

29 As I have used to show elsewhere (Jasanoff (1988a)), such presents are independently attested in the Hittite-type *gānetti 'recognize' < *gāđhā-ti.
30 Tocharian did, however, extend the s-vocalism of the 3sg. to the rest of the active, as can be seen from A 3pl. ąnakər < *nēk-ə. The old o-grade is preserved in forms like B 1sg. nekə 'I will destroy' and 2sg. nekət 'you will destroy', which are synchronically subjunctives. The special significance of Hittite and Tocharian for the history of the s-aorist was pointed out by Watkins (1962:61 ff.), building on earlier work by V. V. Ivanov.
Bibliography


