

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 latest 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. *ási* 'you are' and Gk. εἶ show that the 2sg. of the copula in late PIE was **h₂ési*; few scholars would question the general view that this form goes back to an earlier preform ***h₂és-si*. Similarly, the nom. sg. of certain *r*-stems ended in late PIE **-ēr* (cf. Gk. θυγάτηρ 'daughter', Gaul. *duxtir*, etc.), with lengthening but no overt case ending; most modern authorities would follow Szemerényi (1970:155) in tracing **-ēr* to a pre-PIE nom. sg. in ***-er-s*.¹ More often than not, however, attempts to go beyond the comparative evidence lead to uncontrolled speculation. Pedersen's projection of late PIE **deiwó-* 'god' back to an alleged pre-PIE ***dāyāwā-* (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.:²

¹ The most spectacular achievement of internal reconstruction in IE studies, of course, remains Saussure's 1878 deduction of the laryngeals. 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 | |
|-----|---|---------------------------------------|-----------------------------|-------------------|-----------------|
| | | primary | secondary | primary | secondary |
| sg. | 1 * <i>-h₂e</i> ³ | * <i>-h₂e-r</i> | * <i>-h₂e</i> | * <i>-m-i</i> | * <i>-m</i> |
| | 2 * <i>-th₂e</i> | * <i>-th₂e-r</i> | * <i>-th₂e</i> | * <i>-s-i</i> | * <i>-s</i> |
| | 3 * <i>-e</i> | a) * <i>-to-r</i> b) * <i>-o-r</i> | * <i>-to</i> * <i>-o</i> | * <i>-t-i</i> | * <i>-t</i> |
| pl. | 3 * <i>-ēr</i> , * <i>-ǵ(s)</i> | a) * <i>-nto-r</i> | * <i>-nto</i> | * <i>-(é)nt-i</i> | * <i>-(é)nt</i> |
| | | b) * <i>-ro-r</i> (?) | * <i>-ro</i> | | |

These reconstructions incorporate the findings of Kuryłowicz (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 **-ēr* in Lat. *-ēre* (< **-ēr-i*) and (probably) Hitt. *-er*, as **-ǵ* in Av. *-arš* and OIr. *-atar* (< **-ont-ǵ*), and as **-ǵs* in Ved. *-uh* and GAv. *-arāš*. 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 ***-(é)rs*, formally parallel to the active 3pl. in **-(é)nt*. The surface variant **-ēr* represents the phonologically regular reflex of accented full-grade **-érs* (cf. nom. sg. **ph₂-tér* 'father' < ***ph₂-tér-s*), while **-ǵs* and **-ǵ* represent phonological and analogical treatments, respectively, of the corresponding zero grade.

In the middle the mark of the primary endings was **-r*, a particle unrelated to the ending of the 3pl. perfect but structurally parallel to the **-i* of the primary active endings.⁴ As for the desinenes themselves, the 1sg. in **-h₂e*, which is best preserved in Anatolian (cf. Hitt. *-hha(ri)*) and Indo-Iranian (cf. Ved. *-e*), shows analogical forms with the substitution of *-m-* for **-h₂-* (> -Ø-) in Greek (cf. *-μαι*, *-μῶν*) and Tocharian (A *-mār*, B *-mar*). Similarly, the 2sg. middle in **-th₂e*, which retains its characteristic *-t-* in Anatolian (Hitt. *-ttat(i)*), Tocharian (A *-tār*, B *-tar*), Celtic (OIr. *-ther*) and Vedic Sanskrit (*-thāḥ*), has introduced *s*-forms in Greek (*-σαι*, *-σο*), Latin (*-re*), Germanic (Go. *-(a)za*) and Iranian (Av. *-be*, *-hā* ;

³ In the interests of morphological clarity, laryngeal coloration is not indicated in these reconstructions. The phonetic value of **-h₂e* in late PIE, of course, was [-h₂a].

⁴ That **-r*, and not **-ri*, was originally obligatory in the present middle in Anatolian is demonstrated by Yoshida (1990). The Hittite 2sg. in *-ttati* contains the Anatolian reflexive particle **ti*, substituted for **-r(i)* to avoid homophony with the 3sg. in *-ttari* (cf. Melchert (1992:192)).

cf. Ved. *-se*). The position of the third person endings is more complicated. The relationship of **-to(r)* to **-o(r)* in the 3sg., and of **-nto(r)* to **-ro(r)* in the 3pl., is formally comparable to that of Gk. *-μαι*, *-σαι* to Hitt. *-hha(ri)*, *-tta(ti)*. But unlike the *m-* and *s-* endings of the first and second persons, which are clearly post-IE creations with the consonantism of the active, **-to(r)* and **-nto(r)* are found in almost every IE language and must be assumed for the common period.

There is reason to believe that the endings **-o(r)* / **-ro(r)* and **-to(r)* / **-nto(r)* had partly distinct functions in late PIE. Wherever *-e* (< **-oi* for **-or*) and *-te* (< **-toi* for **-tor*) co-occur in the same paradigm in Indo-Iranian, the *t*-less ending has passive force, as, e.g., in Ved. *bruvé* 'is called' beside *brūté* 'invokes', *stáve* 'is praised' beside *stávate* 'praises, is praised', and *śṛṇvé* 'is heard' beside *śṛṇute* 'hears'. The same repartition of functions can be observed in Old Irish, where the *t*-less ending *-a(i)r* appears exclusively in the 3sg. passive/impersonal of primary verbs (cf. *berair*, *·berar* 'is borne', *tiagar*, *·tiagar* 'one goes', *benair*, *·benar* 'is struck'), while *-thir*, *-thar* (*-ther*) serves as the 3sg. ending of primary deponents (*seichthir*, *·seichthar* 'follows', *midthir*, *·midthar* 'judges', etc.). Indirect evidence for a similar contrast is found in Tocharian.⁵ These facts, together with the lexically restricted appearance of **-o(r)* / **-ro(r)* in the deponent inflection of Indo-Iranian and Anatolian (cf. Ved. *śáye* (3pl. *śére*), Luv. *ziyar* 'lies'; Ved. *duhé* (3pl. *-ré*) 'milks, gives milk'; Hitt. *esá(ri)* 'sits'), have led some investigators, notably Oettinger (1976), to conclude that PIE had a "stative" diathesis, distinct from the middle, in the third person.

Problems of terminology aside, this claim is technically true but misleading. Neither in Anatolian, Indo-Iranian or Celtic is there any hint of a *t*-less 3sg., much less of a 3pl. in **-ro(r)*, in the extremely common derived thematic presents in **-je/o-*, **-eje/o-*, and **-ške/o-*. In Hittite the denominatives in *-ie-/iya-* and iteratives in *-škila-* have 3sg. middles, which may also be passive, in *-ietta(ri)/iyatta(ri)* and *-škitta(ri)/škatta(ri)*, respectively, but there are no forms in **-iya(ri)* or **-ška(ri)*.⁶ Likewise, in Vedic Sanskrit, deponents like *mriyate* 'dies', *jáyate* 'is born', and the productively derived passives in *-yá-* (e.g., *vidyáte* 'is found', *kriyáte* 'is made', *dṛśyáte* 'is seen') are never attested with 3sg.

⁵ The Tocharian class III subjunctives (type A *pkatār*, B *pketār* 'will ripen' < **pké*otor*, A *nkatār*, B *nketār* 'will perish' < **nékotor*, etc.), which are intransitive and opposed to transitive actives, are formally thematic middles with persistent *o*-color of the thematic vowel. The 3sg. in **-otor* represents earlier **-or*, which contrasted with **-etor* (cf. B *pāštār* < **pasketor* 'preserves') in pre-Tocharian.

⁶ Forms of the type *halziyari* 'is called', *tiyari* 'is put', etc. are not, of course, built to thematic stems in **-je/o-*, but to athematic stems in **-i-*.

forms in *-ye. Even in Old Irish, where primary thematic presents form *t*-less passives of the type *berair*, *berar*, old *ie/o*- presents like *gairid* 'calls' and the weak verbs in *-ā* (< *-āje/o-) and *-ī* (< *-ije/o-) make their passives in *-thir*, *-thar* (*gairther*, *morthar* 'is praised', *léichtir* 'is left'). All this suggests that the 3sg. in *-to(r), and presumably also the 3pl. in *-nto(r), were originally analogical competitors of *-o(r) and *-ro(r), typologically comparable to Gk. -ματ and -σαι, albeit older. The locus of *-to(r) and *-nto(r) in the parent language was evidently in the *ie/o*- and *ske/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 **bhéror*, originally meaning both 'bears (for) oneself' and 'is borne', thus came to be represented by two slightly later daughter forms, **bhéror* 'is borne' and **bhéretor* 'bears (for) oneself' (= Skt. *bharate*). The same process also gave rise to **stéu-or* 'is praised' vs. **stéu-tor* 'praises (for) oneself, rühmt sich, στεῦται' 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.⁷ 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 **-h₂o* or a 2sg. middle in **-th₂o*; the attested languages all point

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

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 *-re, with *e*-timbre. The only PIE termination of the form **-rV* was the 3pl. "stative" ending *-ro, which was evidently made by adding *-o, extracted from the other third person endings, to earlier **-r*.⁸ 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 **-érs* to **-ér*, and the subsequent (partial) analogical replacement of the zero-grade variant **-rs* 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 *-r; and 2) the archaic 3sg. middle ended in *-o(r), while the 3sg. perfect ended in *-e.

The derivational history of the desinences **-ro*, **-to* and **-nto*, together with the lack of a primary : secondary 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. **uoid-* : **uid-* 'know', **memon-* : **memn-* 'remember', etc.); the classical middle, on the other hand, is conspicuous for its lack of paradigmatic ablaut (3sg. **kéi-or* 'lies' : pl. **kéi-ror*, 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, as, e.g., in the 2sg. imperative **uid^di* (Ved. *viddhi*, Gk. ἴσθι) and the 3sg. optative **uid-ieh₁-t* (Ved. *vidyāt*, Gk. εἰδείη (for **(f)ιδίη* or **(f)ίζη*)), for which a form of the type **uid-ieh₁-e*, with the corresponding perfect ending, might rather have been expected.⁹ It is significant, moreover, that the injunctive and preterite of the perfect ("pluperfect") take the active endings in Vedic (cf. 1sg. *avedam* 'I knew', 3sg. *abibhet* 'feared', etc.) and Gathic Avestan (*urūraost* 'rejected' < **ruraud-t*). That this was an Indo-European, rather than a purely Indo-Iranian, feature is shown by scattered forms elsewhere, notably Go. *ni ogs* 'fear not!', better taken

⁸ A similarly built **-éro*, with *-o added to **-er*, is evidently preserved in Gathic Avestan forms of the type *āyhāire* 'they sit' (= Skt. *āsate*). The *-o of **-ro* and **-éro* is guaranteed by Toch. B *stare* 'sunt', which probably represents unstressed **stāre* < **sth₂-ró*. Significantly, the corresponding 3sg. is *ste* < **sth₂-ó*.

⁹ The subjunctive of the perfect, of course, shows the usual thematic endings (Gk. εἶδω, εἶδομεν, Ved. *vedat*, etc.).

from an injunctive $*\bar{a}g^h-s$ than from a subjunctive $*\bar{a}g^h-e-s$, and Middle Hittite 3sg. *wewakta* 'asked for' < $*\mu\epsilon\mu\acute{o}k-t$, twice attested as the irregular preterite (for expected $*wewakki\acute{s}$) of the inherited perfect *wewakki* < $*\mu\epsilon\mu\acute{o}k-e(i)$.¹⁰ We will return to the forms of this verb below.

The appearance of active morphology in the extended paradigm of the perfect underscores another "relictal" 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 intrinsically 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 hysterokinetic 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. $\phi\acute{\epsilon}\rho\omega$, Lat. *ferō*, Go. *baira* and Lith. *vedū*, which point to a PIE 1sg. in $*-o-h_2$ rather than $*-o-mi$. From a formal point of view, the ending $*-h_2$ is a shortened, almost certainly apocopated, form of earlier $*-h_2e$, parallel to the $*-h_1$ that appears in place of $*-h_1e$ in the nom.-acc. dual of animate thematic nouns (cf. $*\mu\acute{o}id-h_2e$ 'I know' : $*b^h\acute{e}ro-h_2$ 'I bear', duplicating the pattern of $*p\acute{o}d-h_1e$ 'two feet' : $*\mu\acute{λ}k^{\#}o-h_1$ 'two wolves').¹¹ Since the $*-h_2$ < $*-h_2e$ of $*b^h\acute{e}ro-h_2$ lacks the $*-r$

¹⁰ A pluperfect of this type once existed in Greek as well; it is directly preserved in forms like 1pl. $\acute{\epsilon}\rho\acute{\epsilon}\tau\iota\theta\acute{\alpha}\mu\epsilon\nu$ 'we believed', 3pl. $\acute{\iota}\sigma\alpha\nu$ '(they) knew' (with analogical $-\sigma-$ for $*-\delta-$) and 2du. $\acute{\epsilon}\acute{\iota}\kappa\tau\eta\nu$ 'they (two) resembled'. The regular pluperfect singular in $-\epsilon\alpha$, $-\epsilon\alpha\varsigma$, $-\epsilon\iota$ is an inner-Greek innovation, as is the distinctive pluperfect of 'know' (2sg. $\acute{\eta}\delta\eta\varsigma$, $\acute{\eta}\delta\eta\sigma\theta\alpha$, 3sg. $\acute{\eta}\delta\eta$, etc.).

¹¹ The reconstruction $*-h_2$ (rather than $*-h_2e$) is assured by the acute intonation of Lith. $*vedū$ and the bimoric $*-\bar{o}$ of Go. *baira* and OHG *biru*. It is unlikely that $*-h_2$ is simply the zero-grade of $*-h_2e$, 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 $*-oHe$ sometimes appears as $*-oHu$ rather than $*-oH$, as in Ved. $v\acute{y}k\alpha u$ beside $v\acute{y}k\bar{a}$ 'two wolves' and 3sg. $j\acute{a}j\bar{n}\acute{a}u$ 'knows' < $*g\acute{e}gn\acute{o}h_2-e$ (cf. also 1sg. $j\acute{a}j\bar{n}\acute{a}u$ < $*g\acute{e}gn\acute{o}(h_3)-h_2e$). Perhaps $*-oHu$ was the regular treatment when the preceding $*-o-$ was accented, and complete apocope to $*-oH$ was regular otherwise.

of the primary middle endings, it must be classed descriptively with the endings of the perfect series. But forms like $*b^h\acute{e}ro-h_2$ were neither perfect nor middle in PIE; they were unequivocally non-stative and active, contrasting with middles in $*-o-h_2e-r$ (cf. Lat. $-or$, OIr. $-ur$; remodeled Ved. $-e$, Gk. $-\omicron\mu\alpha\iota$, Go. $-ada$, etc.). Just as the preterite (pluperfect) corresponding to $*\mu\acute{o}id-h_2e$ 'I know' was $*(\acute{\epsilon})\mu\acute{o}id-\eta\eta$ 'I knew', with the active ending, the imperfect/injunctive corresponding to $*b^h\acute{e}ro-h_2$ was $*(\acute{\epsilon})b^h\acute{e}ro-m$. 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.¹² One may go further and speculate with Watkins (1969 *passim*) 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. $*b^h\acute{e}re$ 'bears', though perfectly plausible for an early stage of PIE, seems unlikely for the immediate ancestor of the historical IE languages, where the comparative evidence points unambiguously to $*b^h\acute{e}reti$.

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) *hi*-conjugation. Verbs of this inflectional type show the endings $-h\bar{h}i$ (archaic $-h\bar{h}e$), $-tti$ and $-i$ in the present singular, pointing to *i*-extended forms of the perfect endings $*-h_2e$, $*-th_2e$ and $*-e$. *hi*-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 *hi*-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., $*[se-]s\acute{o}h_2g-h_2e$ 'ich bin einer Spur nachgegangen und habe in Erfahrung gebracht' > 'ich weiß' (: Lat. $s\acute{a}g\acute{i}\acute{o}$)) added the particle $*i$ when used in a specifically presential sense, thus leading to the establishment of present : preterite pairs of the type $*sagg-h\bar{a}i$ (> $S\acute{a}k\bar{h}i$) 'I know' : $*sagg-h\bar{a}$ (> $s\acute{a}k\bar{h}un$) 'I knew'.

2) Other inherited perfects developed into (originally resultative) preterites (e.g., $*ak-h\bar{a}$ 'I am dead, $t\acute{e}\theta\nu\eta\kappa\acute{o}$ ' > 'I have died' > 'I died'), from which new analogical presents ($*ak-h\bar{a}i$ 'I die') were backformed in imitation of stative pairs like $*sagg-h\bar{a}i$: $*sagg-h\bar{a}$

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 **ēd-mi* 'I eat': **ēd-mi* 'I ate'.

3) The new conjugation in *-*hai* was extended to a variety of stem-types that had no historical connection whatever with the perfect, such as the iteratives in -*šš*- (e.g., *iššahhi* 'I perform'), the "duratives" in -*anna(i)*- (*iyannahhi* 'I proceed') and the factitives in -*ahh*- (**newahhi* '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 *šākhhi* 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 -*šš*- and -*ahh*-, consistently appear as *hi*-verbs in Anatolian, while others, such as the virtually synonymous types in -*ski*- and -*nu*-, remain in the *mi*-conjugation.

In fact, the best candidate for an inherited perfect in Hittite is not *šākk-* / *šekk-* 'know', but the exceptional *hi*-verb *wewakk-* 'ask for'. The underlying root is **wek-* 'wish (for)' (cf. Skt. *vāṣṭi* (also 'orders'), Gk. *ἐκών*, Hitt. *wekzi*), which also forms a perfect (*vāvasūr*, *vāvasānā-*) in Vedic. As we have seen above, the preterite of this verb is attested in Middle Hittite as 3sg. *wewakta*, a form difficult to motivate within Hittite but precisely comparable to the Indo-Iranian pluperfect type *abibhet*, *urūraost*, etc.¹³ The pair *wewakki* : *wewakta*, presupposing a late PIE **weyók-e* 'wishes' : **weyók-t* 'wished',¹⁴ undercuts the perfect theory

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 -*š* (cf. *ašāšta* 'settled', *hašta* '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. Oettinger's comment on this form (p. 433, fn. 80) is inconsistent with his other statements about the distribution of -*š* and -*ta*.

¹⁴ The accent of Ved. 2sg. pres. *vavāksi* shows that this form cannot go back to a present of the type 3sg. **weyók-ti*, as suggested by Oettinger. Rather, it is a back-formation from the corresponding pluperfect 2sg. **weyók-s*, parallel to such forms as 2sg. *mamatsi* (: *mad-* 'rejoice'), 3du. *viviktāh* (: *vya-* 'encompass') and post-Rigvedic 3sg. *bibheti*, on which see now Cardona (1992). The present *vivāṣṭi* is a modernization of

in two ways: it shows that inherited perfects retained their reduplication in Anatolian, and that presents like the putative *(*se*)*sagg-hai* 'I know', if indeed based on perfects, should have had preterites in *-*m*, *-*s*, *-*t*, and not (*pace* Eichner) *-*ha*, *-*ta*, *-*e*, during the formative period in the development of the *hi*-conjugation.

Since the *hi*-conjugation cannot be explained as an Anatolian innovation, it must be considered an archaism. This is in essence the position of the "*h₂e*-conjugation theory," an early version of which was presented in Jasanoff (1979). The central tenet of the *h₂e*-conjugation theory is that certain late PIE present classes took the perfect endings in their active indicative forms. For one such class — the reduplicated stative presents that constitute the perfect proper — this claim is uncontroversial. For another, the thematic conjugation, the *h₂e*-conjugation theory offers an attractive framework for explaining the 1sg. in *-*o-h₂*, even though the rest of the thematic paradigm must have been fully "activized" by late PIE times. More important, however, are the cases where the perfect endings were added to athematic present stems. In Common Anatolian, as we shall see, such presents were preserved with their endings intact in the singular, save for the facultative addition of the *hic et nunc* particle **i*. The other branches of the family eliminated the *h₂e*-conjugation entirely. Nowhere outside Anatolian were active presents with the perfect endings retained; their typical fate was to be absorbed into the thematic conjugation during the dialectal period.

In effect, then, the *h₂e*-conjugation theory asserts the existence of a PIE category precisely analogous to the Anatolian *hi*-conjugation. The basis for this claim is strictly comparative: as will emerge in what follows, the correspondences between the *hi*-verbs of Hittite and their cognates in the other IE languages are too numerous and too detailed to be interpreted in any other way. The question naturally arises as to why certain active presents should have inflected with the perfect endings in the parent language while others took the *mi*-endings. A tentative reason will be offered below. It is important to realize, however, that the question of *why* there might have been an active conjugation with the perfect endings is quite distinct from the question of *whether* such a conjugation existed, and the answer to the 'why' question may be unrecoverable, submerged beneath millennia of IE prehistory. For late PIE, as (*mutatis mutandis*) for Common Anatolian, the *h₂e*-conjugation was simply a morphological class, devoid of any meaning that distinguished it from the ordinary active conjugation in 1sg. *-*mi*.

**vavāṣṭi* with normalized accent and secondary *i*-reduplication (cf. *sīṣakti* 'follows' beside 3pl. *sāscati*, *jigāti* 'goes' beside *jāgat-* 'world').

We may begin our survey of the main h_2e -conjugation present types by considering the root $*melh_2$ - 'grind'.¹⁵ This verb forms a thematic present with variable root vocalism in most IE languages (cf. Go. *malan*, Lith. *malù* (o -grade), OIr. *melid* (e -grade), Lat. *molō* (o - or e -grade), MW *malu*, Arm. *malem* (zero grade)). As seen by Meillet in 1916, these forms point to an athematic root present, as does the ie/o -present that appears in Slavic (*meljō*). But o -grade is unknown in ordinary athematic paradigms, and Hittite, where root presents in 1sg. $*-mi$ are generally well-preserved (cf. *ēšmi* 'I am', *šešmi* 'I sleep', *ēpmi* 'I grasp', etc.), here has a hi -verb (1sg. *mallahhi*, 3sg. *mallai*, 3pl. *mallanzi*). These facts suggest the following as the PIE paradigm:

| | | | | | |
|-------|-----------------|-----------|-------|----------------|------------|
| sg. 1 | $*mólh_2-h_2e$ | 'I grind' | pl. 1 | $*mélh_2-me$ | (vel sim.) |
| 2 | $*mólh_2-th_2e$ | | 2 | $*mélh_2-te$ | (vel sim.) |
| 3 | $*mólh_2-e$ | | 3 | $*mélh_2-ǵ(s)$ | |

The individual languages simplified this pattern in different ways. Hittite added the $*i$ of the *hic et nunc* and replaced the plural endings with those of the *mi*-conjugation; later, the synchronic stem *malla-* (occasionally still *mall-*) was extracted from the 3pl. (*mallanzi* < $*melh_2-$) 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. *stuvánti* for $*stávati$ < $*stéu-nti$, etc.) or may have originated in a 2sg. impv. $*mlh_2-ó$, the evidence for which, inconclusive at best, will not be discussed here.

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

$*konk-$ / $*kenk-$ 'hang (tr.)': cf. Go. *haban*, $-iþ$ (tr.), also $-aiþ$ (intr.) < 3sg. mid. $*-ai$ + $*-þ$; Ved. *śankate* 'hesitates'; OH *kānki*: *kankanzi* (tr.), later middle *gangattari* (intr.)¹⁶

¹⁵ The reconstruction with $*-h_2-$ is suggested by Luv. (*mam*)*malh-*; cf. Melchert (1993: 132, 134). $*-b_2-$ is also possible, but not $*-h_2-$; the medial $-e-$ of Myc. *me-re-ti-ri-ja* 'μελετρια' must have been assimilated from earlier $*-a-$ or $*-o-$.

¹⁶ Since the conditions under which $*-e-$ became $-a-$ 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(p)anzi* (: 3sg. *karāpi*; cf. below).

$*b^hod^b(H)-$ / $*b^hed^b(H)-$ 'dig': cf. OCS *bodq* 'I stab'; Lith. *bedù* 'I implant'; Lat. *fodiō*; Hitt. *paddai*

$*g^hrob^h-$ / $*g^hreb^h-$ 'dig': cf. Go. *graban*; OCS *pogrebō*; perhaps Hitt. *karāpi* 'früht', pl. *karip(p)anzi* (if not rather < $*g^hreb^hH-$ 'seize')

$*b^hor-$ / $*b^ber-$ 'hit': cf. OCS *borjō*; Lith. *barù* 'I scold'; OIcel. *berja*; Lat. *feriō*

$*spond-$ / $*spend-$ 'libate': cf. Gk. *σπένδω*; Hitt. *išpanti*

$*g^hong^h-$ / $*g^heng^h-$ 'stride': cf. Go. *gaggan* 'go'; Lith. *žengiù*

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 hi -verbs like *harr(a)*- 'crush', *iškār-* 'implant' and *ārḱ-* 'cut up' to this class as well.¹⁷ But not all root verbs of the hi -conjugation go back to *molō*-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 retrenchment and gradual elimination of the h_2e -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. $*mélh_2-ǵ(s)$ 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 $*mélh_2-ǵti$. Or again, the 3sg. $*mólh_2-e$ 'grinds' could very well have been equipped with an analogical imperfect $*mólh_2-et$, with added $*-t$, before the end of the common period.¹⁸ Such remodelings, though not directly verifiable,

¹⁷ For a general discussion of o -grade presents see Hiersche (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. preterite of the h_2e -conjugation, since Hittite has everywhere generalized $-š$ < $*-s-t$, originally proper only to a small subset of hi -verbs of aoristic origin (see below). The pre-Hittite 3sg. preterite corresponding to the present $*mólh_2-ei$ should theoretically have been $*mólh_2-e$, without the $*-i$ of the *hic et nunc*. The assumption of an inner-IE remodeling of $*mólh_2-e$ to $*mólh_2-e[ti]$ would have two advantages: 1) it would help to account for the family-wide tendency of h_2e -conjugation verbs to become thematic outside Anatolian, and 2) it would provide a direct explanation for the attested Hittite 3sg. pret. *mallet* and its apparently back-formed present *mallezzi*. Few hi -verbs, however, give direct evidence for a preterite in $*-et$.

would simply have anticipated the general direction of drift in the later languages.

Another class of PIE h_2e -conjugation presents is represented in Hittite by the type $dāi$ 'puts', 3pl. $tīyanzi$ (: PIE $*d^b h_2-$). It is impossible to separate the i -element in these forms from the thematic $*-je/o-$ 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 | $*d^b h_2-i-h_2e$ | 'I suck' | pl. 1 | $*d^b h_2-i-mé$ |
| | 2 | $*d^b h_2-i-th_2e$ | | 2 | $*d^b h_2-i-té$ |
| | 3 | $*d^b h_2-i-e$ | | 3 | $*d^b h_2-i-ēr$ |
| | mid. 3 | $*d^b h_2-(i)-ór$ | | | |
| II. | sg. act. 1 | $*spēh_2-i-h_2e$ ¹⁹ | 'I thrive' | pl. 1 | $*spēh_2-i-me$ |
| | 2 | $*spēh_2-i-th_2e$ | | 2 | $*spēh_2-i-te$ |
| | 3 | $*spēh_2-i-e$ | | 3 | $*spēh_2-i-γ(s)$ |
| | mid. 3 | $*spēh_2-i-or$ | | | |

Representative PIE stems of type I were $*uī(é)h_2-i-$ 'entwine', $*pt(é)h_2-i-$ 'fly, fall', $*d(é)h_2-i-$ 'bind', $*d(é)h_2-i-$ 'divide' and $*kþ(é)h_2-i-$ 'acquire'. Representative of type II were $*snēh_2-i-$ 'spin' and $*lēh_2-i-$ 'cry'.

Types I and II fell together in Hittite, where i -presents became productive. Hitt. 3sg. $dāi$ — itself an illustration of this productivity — is regular for $*dēji$ (*vel sim.*) < $*d^b h_2-i-ei$; 2sg. $daitti$ reflects the anticonsonantal stem $*d^b h_2-i-$; 20 1sg. $teþhi$ shows the normal monophthongization of $-ai-$ before $-h-$. Roots in $*-h_2-$ regularly lost their laryngeal before $*-i-$ and eliminated it analogically elsewhere (cf., e.g., 3sg. $iþpāi$ < $*spēh_2-i-ei$, 2sg. $iþpaitti$ for $*iþpeþitti$ < $*spēh_2-i-$). Most of the other branches of the family developed thematic presents of the form $*C(C)V-je/o-$ from both types I and II (cf. Lat. $uieō$, $neō$, OHG $tāen$ 'suckle', $spuoen$ 'succeed', etc.); type II, however, is sometimes detectable from language-to-language differences in vocalism, as, e.g., in the case of Balto-Slavic $*spēje/o-$ (Lith. $spėjū$ 'I am fast enough', OCS $spējō$ 'I

¹⁹ The suggestion that this root ended in $*-h_2$, which would help to explain the voiceless aspirate of Skt. $sphāyate$ (cf. below), is due to Alan Nussbaum. That some Hittite i -presents were built to roots in $*-h_2-$ is beyond dispute in any case; Risch's idea (1955:197 f.) that the $-i-$ of these forms is a reflex of $*-h_2-$ is simply untenable.

²⁰ There seems no reason to exclude the possibility that $*-eh_2i-$ and $*-eh_2i-$ yielded $-ai-$ in Hittite.

succeed' < $*spēh_2-i-$) beside Gmc. $*spō(j)an$ (< $*spēh_2-i-$), or Celtic $*līje/o-$ (OIr. $lūd$ 'accuses' < $*lēh_2-i-$) beside Balto-Slavic $*lāje/o-$ (Lith. $lōju$, OCS $lajo$ 'I bark' < $*lēh_2-i-$). Indo-Iranian and Greek kept types I and II distinct. In type I the anticonsonantal form of the strong stem was generalized to all positions: 3sg. forms like $*d^b ē-i-e$ 'sucks', $*dē-i-e$ 'binds', $*kþā-i-e$ 'acquires' and $*dā-i-e$ 'divides' were replaced by $*d^b ēje$, $*dēje$, $*kþāje$ and $*dāje$ (with $*d^b ēj-$ from $*d^b h_2-i-$, etc.), whence Ved. $dhāyati$, Gk. $δέω$, Ved. $kṣāyati$ = Gk. $κτάομαι$ and Ved. $dāyate$ = Gk. $δαίομαι$.²¹ Predictably, the Indo-Iranian and Greek continuants of type II retained their long vowel, as in Ved. $rāyati$ 'barks', $sphāyate$ (Gram.) 'grows fat' and Gk. $νήω$.

The non-ablating root $*b^b uH-$ 'be(come)' likewise formed an i -present (3sg. $*b^b uH-i-e$, etc.), which for structural reasons is probably best assigned to type I (cf. Ved. root aorist $ābhūt$, like $ābhāt$ 'sucked'). Gmc. $*bū(j)an$ 'live in, farm' shows the normal treatment for type I, as does Gk. $φύω$, $φύομαι$ (-φ- in Homer), dial. $φύτω$ 'I grow, produce'. The apparent stem $*b^b uī-$ or $*b^b uīje/o-$ which underlies Lat. $fiō$, fis , OIr. $būd$, $·bí$ and OE $bīo$, $bīþ$, etc. rests on the anticonsonantal treatment of $*b^b uH-i-$, which regularly underwent metathesis to $*b^b uīH-$ in PIE. Note how here, as in the cases discussed above, the h_2e -conjugation theory disposes of a wide range of disparate facts with a few straightforward assumptions.

Traditional IE comparative grammar recognizes a class of i -reduplicated presents which were already thematic in the parent language, such as $*pi-ph_2-e/o-$ 'drink' (Ved. $pibati$, OIr. $ibid$, Lat. $bibō$), $*si-zd-e/o-$ 'sit down' (Ved. $sīdati$, Gk. $ἵζω$, Lat. $sīdō$), $*s(t)i-sth_2-e/o-$ 'stand' (Ved. $tīsthati$, Lat. $sistō$, OIr. $·sissedar$; Gk. $ἵσταμι$ is secondary), etc. (An interesting Celtic case is OIr. $·icc$ 'reaches' < $*h_2i-h_2nē-e/o-$.) Hittite has no such forms, but it has hi -verbs which reduplicate with $-i-$ in the older language, such as $mimma-$ 'refuse', $pippa-$ 'overturn' and $lilhu(wa)-$ 'pour'. It is natural to suppose that the two types belong together, and that their common source was a PIE paradigm of the type 1sg. $*sī-zd-h_2e$ 'I sit down', 2sg. $*sī-zd-th_2e$, 3sg. $*sī-zd-e$, etc. Reinforcing this identification are two attractive word equations, viz., Hitt. $mimma-$

²¹ The creation of $*d^b ēje$, $*kþāje$, etc. in the third person may have been influenced by the corresponding 1sg. forms $*d^b ēja$, $*kþāja$, etc. (< $*d^b ēih_2a$, $*kþāih_2a$), which arose from $*d^b h_2-i-h_2e$, $*kþh_2-i-h_2e$, etc. by an inner-PIE rule that reduced sequences of the form $*-AH_2HA-$ to $*-AH_2A-$. Compare the development of underlying $*-eh_2-ih_2-oh_2-$ to Ved. $-ayā$ and OCS $-ojo$ (i.e., $*-ojō + -m(i)$) in the instrumental singular of feminine "ā-stems". The difference in treatment between $κτάομαι$ and $δαίομαι$ is secondary, the $-ai-$ of $δαίομαι$ having been restored from the aorist $δαί-σ-$ < $*dēh_2-i-s-$ (cf. also $πτάω$ 'I stumble' (: Hitt. $pidāi$), aor. $πται-σ-$ < $*pēh_2-i(-s)-$).

= Gk. $\mu\mu\nu\theta$ 'I stand firm', and Hitt. $*titt(a)-$ (in $titt(annu-$ 'install') = Lat. *sistō*, etc. Note also Ved. *ud pipīte* 'arises',²² which probably originated in the athematic middle (3sg. $*pi-pH-or$; cf. OH *titha* 'thunders' < $*-ar$) corresponding to the h_2e -conjugation source of Hitt. *pippa-*.

Structurally parallel to *pībati*, *sistō*, etc., are the reduplicated sigmatic presents which serve as desideratives and futures in Indo-Iranian and Celtic (cf. Ved. *cikīṣati* 'desires to know', *jīghāṃsati* 'desires to slay'; OIr. *gigis*, *gig* 'will pray' < $*g^hi-g^hed-s(e)-ti$, *eblaid*, *ebla* 'will drive' < $*pi-plā-se-ti$ < $*pi-plh_2-se/o-$). Despite the obvious difference in meaning, it is tempting to compare these, at least formally, with the Hittite (and Anatolian) iteratives in $-šš(a)-$, which inflect according to the *hi*-conjugation.²³ Most of the Hittite examples are associated with *i*-presents in 3sg. $-āi$, pl. $-iyanzi$, e.g., *šišša-* (: *šāi* 'presses'), *halzišša-* (: *halzāi* 'calls'), *mešša-* (: *māi* 'prosperes'). The exception — and hence a likely archaism — is OH $\check{s}š(a)-$ (3sg. *iššai*, 2pl. *ištēni*, 3pl. *iššanzi*), which serves as the iterative of *ie-lyia-* 'make, do' (< $*ieh_2-$). $\check{s}š(a)-$ probably goes back to a stem $*it-ih_2-s-$, with *i*-reduplication and zero-grade root vocalism as in *cikīṣati*, etc.²⁴ Of the remaining iteratives in $-šš(a)-$, *šišša-* (< $*si-sh_2-s-$?) is also perhaps phonologically regular; the rest can only be analogical. Cf. also Luv. *pipišša-*, from the root of *piya-* 'give'.

Brief mention may be made of a few other h_2e -conjugation present types. A class in 3sg. $*-nh_2i-é$, 3pl. $*-nh_2i-ér$ is indicated by the Hittite "duratives" in 3sg. $-annai$, 3pl. $-anniyanzi$ (e.g., *iyannai* 'proceeds', pl. *iyanniyanzi*, supine *iyanniwān*; the singular forms have been remade); these are evidently to be compared with the deverbative presents in $*-nh_2ie/o-$ of the other IE languages, such as Gk. $\iota\phi\alpha\iota\nu\theta$ 'I weave', Toch. B *māntāññ-* 'injure', and the Vedic types *gṛbhāyāti* 'seizes' (with generalized antevocalic $*-nh_2i-$) and *turanyāti* 'rushes' (with generalized anteconsonantal $*-nh_2i-$ > $*-ani-$?).²⁵ A PIE type in 3sg. $*-eh_2-e$, 3pl. $*-eh_2-i(s)$ underlies the Hittite "factitives" in $-ahh-$ (*newahhi*, etc.) and their familiar cognates elsewhere (cf. Lat. *re-nouāre*, Gk. $\nu\epsilon\acute{\alpha}\nu$, etc.); outside Anatolian these forms were thematized in the usual way, producing

²² Cf. Hoffmann apud Oettinger (p. 498).

²³ See the discussion in Jasanoff (1988b:235 f.).

²⁴ The originally athematic character of this formation is confirmed by the 2pl. *ištēni*, with secondary displacement of the accent to the ending.

²⁵ The roots that form presents of the *turanyāti-* type usually also form thematic aorist or *tudāti-* stems elsewhere in their extended paradigm; cf. *bhuranyāti* 'rushes about': 3pl. impv. *bhurāntu*, *iṣanyati* 'impels': 3pl. inj. *iṣanta*, *huvanyati* 'calls': 1pl. opt. *huvēma*, etc. It is thus possible that the thematic stems *bhurá-*, *iṣá-* and *huvá-* may have influenced the generalization of anteconsonantal $*bburani-$, $*iṣani-$ and $*huvani-$ at the expense of $*bhurāy-$, $*iṣāy-$ and $*huvāy-$.

a stem-final sequence $*-eh_2-e/o-$ (> $*-ā-$) which was generally confused — phonologically or morphologically — with the outcome of $*-eh_2-ie/o-$ ($*-āie/o-$). The "correct" reflex of $*-eh_2-e/o-$ is perhaps to be seen in the Baltic present type in $*-ā-$, with circumflex intonation (cf. Lith. 3p. *stāto* 'build(s)' < $*sth_2tē-h_2-$ 'make $*sth_2-tō-$ '). 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 *lahu-* 'pour' (3sg. $-u(wa)i$) with the traditionally recognized present actives in $*-ye/o-$ and middles in $*-u-$ (cf. Ved. *tūrvati* 'overcomes', mid. *tarute*). In principle, the h_2e -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 *hi*-conjugation is correct, then the perfect endings — the term is a misnomer, but a convenient one — had no specifically stative 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 h_2e -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 $*kēi-e$ 'lies', $*d^hug^h-é$ 'yields', $*memón-e$ 'holds in mind', $*kónk-e$ 'hangs (intr.)' and $*d^héh_2i-e$ '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 *processes* and hence represented by protomiddle rather than by active forms. Early PIE thus also had, e.g., such 3sg. protomiddles as $*mólh_2-e$ 'grinds (away at)' and $*b^hér-e$ '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 $*bbéve(ti)$ and other thematic presents of motion and conveyance was first proposed by Hollifield (1977).

all, of these forms. In the 1pl. and 2pl. the special endings **-med^h₂* and **-d^h(u)me* (*vel sim.*) were introduced; their origin is obscure. Paradigmatic ablaut, where present, was eliminated, usually, though not invariably, by generalizing the vocalism of the plural. Perhaps the most far-reaching innovation was the introduction of the particle **r* to distinguish between primary and secondary endings in the emergent “true” middle. Forms like **kēi-e* and **d^hu^g^h-é* were thus renewed as **kēi-er* and **d^hu^g^h-ér*, respectively, while **memón-e*, **kónk-e*, **mól₂-e*, etc. remained unchanged. In some cases the use of **r* led to the emergence of new grammatical contrasts; thus, e.g., **b^hér-e* ‘bears’ presumably acquired an oppositional passive **b^hér-er* ‘is borne’ at this time.

The differentiation of the middle proper from the residual forms destined to become perfects, thematic actives and *h₂e*-conjugation actives was completed by the introduction and spread of *o*-vocalism in the middle endings of the third person (**-o(r)*, **-to(r)*, etc.). This change is probably to be explained by positing an inner-IE sound law, the effect of which was to replace word-final post-tonic **-er* by **-or* (cf. the pattern Gk. *πατήρ* : *ἐπότωρ*). **kēi-er* and **b^hér-er* thus became **kēi-or* and **b^hér-or*, respectively. Subsequently, the new *o*-vocalism was morphologically exploited to mark other middle forms, so that, e.g., **d^hu^g^h-ér* was replaced by **d^hu^g^h-ór*, **-o* was substituted for **-e* as a secondary middle ending, and the 3pl. in **-ér / *-i(s)* was remade to **-ro(r)*. Once reinterpreted as actives with real or potentially contrasting middles in 3sg. **-or*, the presents of the *h₂e*-conjugation would have been free to take on specifically active (transitive, factitive, etc.) meanings. Thus, e.g., **d^héh₂-i-* ‘suck’ shows the meaning ‘suckle’ in OHG *tāen*, **b^huH-i-* ‘become’ usually means ‘produce’ in Gk. *φύω* (vs. intransitive *φύομαι*), and **kónk-* seems to have acquired its transitive sense in late PIE itself. There is nothing unusual in semantic shifts of this kind, which have an exact parallel in the history of the perfect in Greek (cf. *λέλοιπε* ‘is left (intr.)’ > ‘has left (tr.)’ beside newer *λέλειπται* ‘is left (intr.)’).

The above scenario leads to the prediction that PIE should also have had a class of *h₂e*-conjugation (< protomiddle) *aorists*. Such forms would theoretically have appeared as *hi*-conjugation verbs with backformed presents in Hittite, just as the PIE active root aorist **d^héh₂-t* ‘put’ gives the *mi*-conjugation present *tezzi* ‘says’. This expectation is confirmed; a substantial number of *hi*-verbs, though outwardly similar to old root presents like *kānk-* and *malla-*, are clearly built to aoristic roots which formed only characterized presents in the parent language. To this category belong, e.g., *ār-* ‘arrive’ (: Ved. *árta*, Gk. *ἄρτο*), *lāg-* ‘bend’ (: Gk. *λέκτο*), *šarāp-* / *šarip(p)-* ‘sip’ (: Arm. aor. *arbi* < **s^gh^h-éló-*), *dā-* ‘take’ (: Ved. *ádāt*), *wāk(k)-* ‘bite’ (: Gk. *(f)ἄγγυμι*, aor. pass. *έόγη*), and others.

The late PIE verbal system evidently included aorists of the type **h₂or-* / **h₂er-*, **log^h-* / **leg^h-*, etc., which inflected like presents of the **mol₂-* / **mel₂-* class. In pre-Hittite, inherited preterites like **ār-ḫa* ‘I arrived’ and **lāg-ḫa* ‘I lay down’ were equipped with presents **ār-ḫai* and **lāg-ḫai*, respectively, which yielded Hitt. *arḫi* and **lākḫi*. The transitive meaning of *lāg-* is a consequence of its semantic polarization with the “true” middle *lagāri* ‘is bent’.²⁷

Traces of *o*-grade aorists are comparatively rare in the non-Anatolian languages, in part because they were commonly remade as ordinary middles with “weak” vocalism (cf. Ved. *árta* (ptcp. *árāna-*) < **h₂ér-to*, Gk. *λέκτο*; *o*-grade is exceptionally retained in *ἄρτο*). But *o*-grade is systematically reflected in two post-IE categories: 1) the Indo-Iranian intransitive (“passive”) aorist in 3sg. *-i* (e.g., *ábodhi* ‘awoke’, *ároci* ‘shone forth’, *ápādi* ‘went’, etc.); and 2) the Tocharian A intransitive middle preterites *nakāt* ‘perished’, *pakūt* ‘ripened’, *tsakūt* ‘burned (intr.)’ and *lyokāt* (for **lokāt*; cf. Toch. B *lauksate*) ‘shone forth’. Although both Indo-Iranian and Tocharian have replaced the original *h₂e*-conjugation 3sg. in **-e* by a new ending, it is hard to escape the conclusion that Ved. *ároci* and CToch. **laukte* (< **lónk-to*) constitute a significant word equation.

The fact that *ároci* and *lyokāt* are intransitive and paradigmatically isolated is not accidental. The aorist 3sg. in **-e* 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 **nok-* / **nek-* (sg. **nok^h-h₂e*, **-th₂e*, **-e*, pl. **nek^h-me*, **-(t)e*, **-i(s)*) was no doubt originally intransitive and had the meaning ‘perished’.²⁸ Like 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 *h₂e*-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^h-med^h₂* ‘we perished’ and 3pl. **nek^h-ro* ‘they perished’ henceforth contrasted with

²⁷ Here, as in presents of the *kānki* : *kankanzi* type, there has been evident extension of a “morphological” zero grade in *-ā-* (cf. note 16). Weak present forms of the type 3pl. *lāganzi* and *āranzi* are inseparable from *mi*-conjugation forms of the type *appanzi* ‘(they) seize’ and *āsanzi* ‘(they) are’; they probably owe their origin to a proportion of the type *eppir*, *ešir* : *appanzi*, *āsanzi* : **legir*, **erir* : *X* (*X* = *laganzi*, *aranzi*).

²⁸ Or — conceivable at this early stage — it was bivalent, with the meanings ‘perished’ and ‘destroyed’. The forms quoted for the 1pl. and 2pl. endings are purely formulaic.

older 1pl. **nek-me* 'we destroyed' and 3pl. **nek-γ(s)* 'they destroyed'. The active : middle contrast was likewise introduced into the 1sg. and 2sg.; here, however, the middle and *h₂e*-conjugation endings were identical, and the difference between the two diatheses was simply expressed by the difference in vocalism between 1sg. **nok-h₂e* and 2sg. **nok-th₂e*, which were active, and 1sg. **nek-h₂e* and 2sg. **nek-th₂e*, with leveled "weak" vocalism, which were middle. Against the background of these changes, it might have been expected that the inherited 3sg. **nok-e* would be assigned to the active paradigm, and that a new middle **nek-(t)o*, parallel to **nek-h₂e* and **nek-th₂e*, would be created within PIE to express the meaning 'perished'. But events took a different course. The evidence shows that the 3sg. **nok-e* was assigned to the emergent middle paradigm; to express the sense 'destroyed', a wholly suppletive form, originally the imperfect of a sigmatic present with "Narten" ablaut, was appropriated from the present system.²⁹ The result was that **nok-h₂e* 'I destroyed' and **nok-th₂e* 'you destroyed' acquired an utterly unrelated form — **nek-s-t* — as their 3sg. counterpart, while the inherited 3sg. **nok-e* survived with its *o*-grade intact in an otherwise "normal" intransitive middle paradigm. In post-IE times, forms of the type **nek-s-t* became the source of the classical *s*-aorist, while forms of the type **nok-e* became the source of the Vedic "passive" aorist *āroci* and the Tocharian A intransitive type *lyokät*, *nakät*, etc.

The subsequent evolution of the *s*-aorist has been described elsewhere (cf. Jasanoff (1988a)). Starting from a few inherited forms like 3sg. *naiš* 'turned (tr.), led' < **neiH-s-t* (= Ved. *ánaiḥ*), Hittite generalized the 3sg. in **-s-t* to all *hi*-conjugation preterites. It did not, however, systematically extend the *s*-element from the 3sg. to the rest of the paradigm, which thus retained its *h₂e*-conjugation inflection (1sg. *nehhun*, 2sg. *nāutta*, etc.). Tocharian, like Hittite, confined **-s-* to the 3sg. in the active (cf. B 3sg. *neksa*, but 1sg. *nekwa*, 3pl. *nekar*, etc.),³⁰ but, unlike Hittite, developed a fully sigmatic middle paradigm in verbs other than *lyuk-*, *nak-*, 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

h₂e-conjugation root aorist. The history of the sigmatic 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 reconstruction 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 **-ro*, the origin of the **-e* : **-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 glottogenic 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 if 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 reconstructing 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 tried to show elsewhere (Jasanoff (1988b)), such presents are independently attested in the Hittite type *ganešzi* 'recognizes' < **gnēh₂-s-ti*.

³⁰ Tocharian did, however, extend the *ē*-vocalism of the 3sg. to the rest of the active, as can be seen from A 3pl. *ñakār* < **nek-*. The old *o*-grade is preserved in forms like B 1sg. *neku* 'I will destroy' and A 2sg. *nakät* '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.

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