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**PROCEEDINGS OF THE TWENTY-FOURTH ANNUAL MEETING
OF THE
BERKELEY LINGUISTICS SOCIETY
February 14-16, 1998**

**SPECIAL SESSION
ON INDO-EUROPEAN SUBGROUPING AND
INTERNAL RELATIONS**

February 14, 1998

Edited by

Benjamin K. Bergen

Madelaine C. Plauché

and

Ashlee C. Bailey

**Berkeley Linguistics Society
Berkeley, California, USA**



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**SPECIAL SESSION:
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PREFACE

We are delighted to present the proceedings of the Special Session of the Twenty-Fourth Annual Meeting of the Berkeley Linguistics Society. We would like to thank the organizers of BLS conferences past for their insightful advice and the organizers of BLS 25 for so swiftly and energetically taking up the substantial responsibility involved in organizing this conference. We would also be remiss if we neglected to thank all of the volunteers who made BLS 24 possible, especially Steve Chang and Lily Liaw. We hope you enjoy the volume as much as we enjoyed preparing it.

BLS 24S Editors
Benjamin K. Bergen
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Ashlee C. Bailey

SPECIAL SESSION

The linguistic position of Lepontic

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1. Introductory matters. Lepontic is a fragmentarily attested language which was spoken in a restricted area ca. 100 km. in diameter centred on the alpine town of Lugano in the northern Italian lake district; see Frey (1995: 516) for an excellent map. The corpus is composed of ca. 140 mostly short inscriptions; the principal modern collections and analyses are Lejeune (1971), Tibiletti Bruno (1981), and Solinas (1995). The datings of the Lepontic inscriptions range from ca. 600 BCE to the first century BCE. Many of them can be dated to a fairly narrow period on the basis of epigraphic and archeological grounds. There are two primary groups of inscriptions; a smaller one from the sixth and fifth centuries, and a larger one from the second and first centuries. Few inscriptions can be reliably dated to the fourth and third centuries; on the dating of the Lepontic corpus, see De Marinis (1981, 1988, 1991). Virtually the entire corpus is engraved in the Lugano script, a segmental script derived from the northern Etruscan script;¹ see Lejeune (1971: 8–27) for a general discussion of the conventions of the script and De Marinis (1991: 94–95) for an illustration of its diachronic variation.

In the early days of the study of the corpus of Lepontic inscriptions, scholars were divided as to the classification of the language in which they are written. It was identified as Ligurian (e.g. Kretschmer 1905), Celticised Ligurian (e.g. Rhys 1906, 1913), Celtic — but discrete from Gaulish (e.g. Danielsson 1909, Krahe 1936), somewhere between Celtic and Italic (e.g. Whatmough 1933, Pulgram 1978), and western Indo-European mixed with non-Indo-European elements (Kretschmer 1943). Herbig (1911) was agnostic beyond identifying it as an Indo-European language. See Hirunuma (1986) and Solinas (1992–93) for reviews of scholarship on Lepontic, the latter up to ca. 1950.

Today the communis opinio is that Lepontic is a variety of Celtic laid over one or more substrata (e.g. Lejeune 1971: 121–23).

Celtic features attested in the Lepontic corpus include the following (see Krahe 1936: 244–47, Lejeune 1971: 67–70 & 116–21, Uhlich 1997):

1. IE $*\delta >$ Celt. \bar{u} / $_\text{C}_0\#$, e.g. thematic dat. sg. $-\bar{u}i < *-\delta i$, e.g. **Teromui** (S 29).²
2. IE $*g^w >$ Celt. b , e.g. **Piuo-** (e.g. S 39) $< *g^wih_3uo-$.
3. IE $*\bar{e} >$ Celt. \bar{i} , e.g. **siTeś** (S 65) $< *s\bar{e}d-$.
4. IE $*p >$ Celt. \emptyset (eventually),³ e.g. **laTu-** (S 128) $< *p\bar{l}h_2tu-$.
5. IE $*i >$ Celt. e (tendency in unstressed position), e.g. n -stem dat. pl. **-onePos** (S 65) $< *-\text{on-}i-\text{bos}$ (after i -stems).
6. IE $*st >$ nuclear Celtic proximate $[\emptyset-:]$ ⁴ (written $<\acute{s}>$ or $<z>$), e.g. **Kozis** (S 65) $< *g^h\text{ost-}i-s$.
7. The Celtic etymon $\bar{u}indo-$ 'white' is attested in **alKouinos** (S 21).

2. Lejeune's classification. Employing the diagnostic criteria of the Celtic k^w/p dichotomy and the resolution of the Indo-European syllabic nasals as either

aN or *eN*, Lejeune (1978: 118–20) set Lepontic up as a discrete, fourth branch of Celtic:

1. Goidelic	<i>k^w</i>	<i>eN</i>
2. Gallo-Brittonic	<i>p</i>	<i>aN</i>
3. Hispano-Celtic	<i>k^w</i>	<i>aN</i>
4. Lepontic	<i>p</i>	<i>eN</i>

However, the *k^w/p* dichotomy is well known to be phonologically trivial (e.g. Hamp 1958), and it is now widely believed that the pan-Celtic resolution of the Indo-European syllabic nasals was *aN* (e.g. McCone 1996: 50–51): resolution as *eN*, which is found sporadically in Gaulish and Hispano-Celtic, as well as commonly in Goidelic, is the result of subsequent raising. Furthermore, Lejeune's classification of Lepontic as an *eN* language rests upon a single form, acc. pl. *siTeš* (S 65), which he derives from **sēd-ns* (1971: 105). The analysis of this form, however, is much disputed.⁵ And Lejeune, as well as many others, seems to have failed to notice the unambiguous evidence provided by *uvamo-* (S 65), which clearly continues **h₁up-m^{mo}o-*, and characterises Lepontic, like the rest of Celtic, as an *aN* language.

Though many scholars continue to regard Lepontic as a Continental Celtic language separate and distinct from Gaulish (e.g. de Hoz 1992, Motta 1992), there is a growing number who suspect that Lepontic is not a discrete language, but a somewhat divergent member of the Gaulish dialect continuum (e.g. McCone 1996: 68–69). The time seems ripe, then, to make a detailed case, which has not been attempted hitherto.

3. De Hoz's inventory. De Hoz (1992: 228) provides the most complete list of the features which are presumed to be diagnostic of the status of Lepontic and Gaulish as discrete languages. The features said to be diagnostic of Lepontic are the following:

1. [+nasal] > Ø / _ [+plosive], e.g. **PiuoTialui** (S 3) (= putative /birwōtialui:/, save **nd* > *nn*, e.g. **alKouinos** (S 21), while in Gaulish nasal + plosive groups are retained.
2. The specific combination of the pronominal stems *i-* + *to-* attested in nom. sg. **išos** (S 119), which is said not to exist outside of Lepontic.
3. The affixation of 3. sg. perf. *-e* to the inherited imperfect to form an innovatory *t*-preterite, e.g. **KariTe** (S 119) < inherited impf. **kr₁-ie-t* + *-e*, while Gaulish affixes *-u*, e.g. **KarniTu** (RIG *E-5).
4. The existence of the clitic connective =**Pe** (S 128) < **=k^we* in comparison to incorporated *-c* in Gaul. ETIC (e.g. RIG L-13) < **h₁eti=k^we*.
5. Different personal names are attested in the Lepontic and Gaulish speech areas.

To these can be added:

6. Lepontic has a thematic gen. sg. in *-oiso*, e.g. **Plioiso** (e.g. S 80) < **-ošio* (see Eska 1995: 42) beside *-i*, e.g. **ašKoneTi** (S 21),⁶ which Gaulish does not.
7. Inherited final **-m* is continued in Lepontic, e.g. acc. sg. **Palam** (S 119), but generally becomes *-n* in Gaulish, e.g. acc. sg. **loKan** (RIG

*E-5).

8. The group **ks* > *ss* in Lepontic, written <*s*>, e.g. *es-* (S 127) < **/eks/-* < **h₁eg^h-s-*, but generally is preserved in Gaulish; cf. the numerous anthroponyms in *-rtx* /ri:ks/ < **h₃rēg-s*, e.g. *εσκιγγορεῖξ* (RIG G-207).

De Hoz (1992: 228–29) also lists a variety of innovations which are said to be characteristic of Gaulish to the exclusion of the rest of Continental Celtic, some of which include the following:

1. The group **li* > *ll* in *al(l)os* (GLG 8), but not in Lep. **alios** (S 60).
2. The *ā*-stem paradigm in Gaulish adopts some of the flexional desinences of the *ī*-stem paradigm, but Lepontic does not; cf. acc. sg. Gaul. *-im*, e.g. *seuerim* (Larzac; to nom. sg. *seuera*) vs. Lep. *-am*, e.g. **Palam** (S 119).
3. Thematic dat. sg. *-ūi* syncretises with instr. sg. *-ū* in later Gaulish, e.g. *MAGALV* (Séraucourt), but Lepontic always has inherited *-ūi*, e.g. **meTelui** (S 122).
4. Gaulish has the suffix *-ā-* as an exponent of the subjunctive mood, e.g. 2. sg. pres. *lubijas* (La Graufesenque), but it is not attested in Lepontic.
5. Gaulish has *-oi* as the thematic nominative plural desinence, e.g. **TanoTaliKnoi** (RIG E-1), but it is not attested in Lepontic.
6. Gaulish has an uninflected relative enclitic =*io*, e.g. *DVGIIJONTI=JO* (RIG L-13), but it is not attested in Lepontic.
7. The basic word order in Gaulish is *SVÖ*, e.g.

- a. [_S MARTIALIS DANNOTALI] [_V IEVRV] ... [_O SOSIN CELICNON] (RIG L-13)

unlike the rest of Continental Celtic, which is *SOV*; cf. the following Lepontic example:

- b. [_S **uvamoKozis PlialeΘu**] ... [_O **siTeš**] [_V **TeTu**] (S 65)

To these can be added:

8. Gaulish has both *-bo* < **-b^hos*, e.g. **ATREBO** (RIG L-15), and *-bi* < instr. pl. **-b^his*, e.g. **GOBEDBI** (RIG L-13), as dative plural desinences, but Lepontic only has *-bos*, e.g. **ariuonePos** (S 65).

4. Crucial temporal and locative factors. Owing to recent epigraphic work on various northern Etruscan scripts, it has recently become possible to combine paleographic information with archeological information, etc., to provide more accurate datings for Cisalpine Celtic texts than previously possible. Whereas it was previously thought that the entire Lepontic corpus was engraved during the last third of the first millennium BCE (e.g. Lejeune 1978: 109), it is now clear that some texts go back to the sixth century BCE, and it is possible that at least one dates from the seventh century BCE (Prosdocimi 1991a: 52–53). In fact, it appears that the Lepontic corpus can be roughly divided into two divisions: a smaller division dating from the sixth and fifth centuries BCE, and a larger divi-

sion dating from the second and first centuries BCE. Very few, if any, texts can be dated to the fourth and third centuries BCE (De Marinis 1991: 94–95).

To the older Lepontic epigraphic stratum belong the several times attested thematic gen. sg. desinence *-oiso* < — **-osio*, which is replaced in the younger stratum by familiar *-i*, and some characters of the script which — though employed in several textual inscriptions in the older stratum — are later attested only as potters' marks.

In comparison, Cisalpine texts said to be Gaulish date from no earlier than ca. 150 BCE (Lejeune 1988: 4–5), and the earliest Transalpine Gaulish text dates from ca. 225 BCE (Lejeune 1985: 3), though most are later in date. Hence, when considering the nature of the relationship between Gaulish and Lepontic, it is important to bear in mind the relative chronologies of their attestations (and not to forget the restricted area within which Lepontic is attested).

5. Lepontic and Cisalpine Gaulish. The small corpus of so-called Cisalpine Gaulish inscriptions are all engraved in the same version of the Lugano script as the later-attested Lepontic inscriptions with the exception of one, which is engraved in the closely related Sondrio script.⁷

These share some features with the Lepontic inscriptions:

1. Nasals are not (usually) noted before plosives, e.g. Gaul. **KuiTos** (RIG E-1) (= Lat. *Quintus*), Lep. **PiuoTialui** (S 3) (with **-ont-*).
2. The group **nd* > *nn*, e.g. Gaul. **anoKoPoKios** (RIG E-1) (< **ando-*), Lep. **alKouinos** (S 21) (< **yindo-*).
3. The prefix **eks-* > *ess-*, e.g. Gaul. **esaneKoTi** (RIG E-1), Lep. **esoPnio** (S 127).
4. Patronymics can be indicated with the genitive singular, the suffix *-io-*, *-eo-*, or the suffix *-kno-*.
5. An innovatory *t*-preterite based upon the inherited imperfect has developed, e.g. Gaul. **KarniTu** (RIG *E-5) < **karne-je-t* + *-u*, Lep. **KariTe** (S 119) < **kr-je-t* + *-e*.

But some features differ between them:

1. Inherited final **-m* is continued in Lepontic, e.g. acc. sg. **Palam** (S 119), but has become *-n* in Gaulish, e.g. acc. sg. **loKan** (RIG *E-5).
2. Lepontic can form patronymics with the suffix *-alo-*, e.g. dat. sg. **maešilalui** (S 122), and perhaps with the suffix *-ū* < **-ō* (Eska 1995: 36 & 43–44), but both of these are unknown in Gaulish.
3. The 3. singular ending of the innovatory *t*-preterite is *-e* in Lepontic, e.g. **KaliTe** (S 119), but normally *-u* in Gaulish, e.g. **KarniTu** (RIG *E-5).
4. Lepontic has a prefix *aš-* (S 122), apparently < **ad-s-*, but it is not known in Gaulish.

Scholars who prefer to see Lepontic and Cisalpine Gaulish as discrete languages claim that the features that the two share either issue from their shared ancestry (subsequent to the departure of the Celts who eventually settled in the Iberian Peninsula) or were adopted by the Gauls from speakers of Lepontic, and emphasise the differences between them (e.g. Lejeune 1971, 1988, de Hoz

1992, Motta 1992). This is certainly possible in some cases, but probably not in the cases of phonological developments, which are always shared between them.

In considering their differences, one must bear in mind the sometimes substantial difference in time of attestation between Lepontic and Cisalpine Gaulish and the restricted area in which Lepontic was spoken.⁸ Thus:

1. Lep. final *-m* can merely be regarded as an archaism beside Gaul. *-n*. Cf. acc. sg. *δεκαντεμ* (e.g. RIG G-27) beside *δεκαντεν* (e.g. RIG G-64) in Transalpine Gaulish.
2. It must be borne in mind that Lepontic, in the restricted area in which it was spoken, surely was in close and prolonged contact with various substratal languages. So may be explained the patronymic in *-alo-*, which is usually considered to have its ultimate source in the Etruscoid language known as Raetic (e.g. Pedersen 1921: 38–48, Lejeune 1971: 52; cf. Prosdocimi 1991b: 163–76). This is no surprise. Likewise, the patronymic in *-ū*, if it is so correctly analysed, might have a substratal source, or, indeed, even be an innovation of its own (cf. Hom. Gk. *Κρονίων* 'son of Kronos', *Πηλείων* 'son of Peleus'; see Risch 1974: 56–57), though hardly an important one for establishing degrees of linguistic relationship given the wide variability in naming practices.
3. The variation between Lep. and Gaul. 3. sg. pret. *-e* and *-u*, respectively, could, in fact, simply reflect a variation present across the Gaulish dialect continuum. Cf. 3. sg. pret. *toberte* (Lezoux) < **to-ber-s-t* + *-e* beside *καρνιτου*⁹ (RIG G-151) < **karne-je-t* + *-u* in Transalpine Gaulish.
4. In view of the fact that the so-called Cisalpine Gaulish corpus is so slight, the absence of the prefix *aš-* may merely be an accident of attestation.

In view of the phonological innovations that Lepontic and Cisalpine Gaulish share and the lack of clear diagnostic value of their few differences, at our present state of knowledge it seems preferable to argue that Lepontic is not a discrete Continental Celtic language, but merely a peripheral and somewhat divergent (owing to substratal effects) member of the Gaulish dialect continuum.

But given these shared innovations, perhaps a more intriguing question is whether a wider cleavage exists between Cisalpine Celtic and Transalpine Celtic.

6. Cisalpine Celtic and Transalpine Celtic. An examination of de Hoz's inventory of diagnostic features specific to Lepontic and Gaulish given in section 3 *supra* reveals that there is not much differentiation between Gaulish on either side of the Alps.

Comments on features said to distinguish Lepontic from all of Gaulish:

1. Latin-Gaulish bilingual inscriptions and Cisalpine Gaulish glosses attested in Latin writers clearly demonstrate that nasals did not completely fall before plosives; an example of the former is Lat. ARGANTO- = Cis. Gaul. *arKaTo-* (RIG *E-2) and examples of the latter include

ambactus 'servus', *cimbri* 'latrones', and *ambrones* 'turpis vitae homines' (see Whatmough 1933: 178–202 *passim*). This is also indicated by epigraphic examples such as Lep. **anTešilu** (S 25) and **PiuonTa** (S 39) in which nasals are noted (exceptionally) before plosives. This leads me to agree with Uhlich (1997, 1998) that in inherited sequences of vowel + nasal before plosive the nasality was transferred to the vowel and hence the nasal consonant symbol was not (usually) written in the native script, but that in the Roman script a nasal consonant was written because nasalised vowels were foreign to Latin.

2. The combination of *is* + *to-* may, in fact, be attested in Trans. Gaul. *ison* and *isoc* (Chamalières), and perhaps also (with apheresis) *Hisp.-Celt. šTena* (MLH K.1.1) and *šTañ* (MLH K.6.1); see Eska (1991).
3. As mentioned *supra*, both *-e* and *-u* are attested as the 3. singular desinence of the innovatory *t*-preterite in Transalpine Gaulish.
4. Lepontic clitic =**Pe** (S 128) vs. Transalpine Gaulish incorporated **-C** (RIG L-13) < **=k^we* is a significant difference, but could simply be the result of the fragmentary nature of the corpora with which we are dealing and the chronological difference between the attestation of Lepontic and Transalpine Gaulish.
5. It is true that different names are attested in the Lepontic and Transalpine speech areas, and it has been noted *supra* that Lepontic has at least one method of forming patronyms unknown elsewhere in Celtic. But naming patterns are a regional matter, and in as large a geographical area as the Gaulish dialect continuum must have encompassed, from Asia Minor to the low countries, considerable variation in naming practices can hardly be considered to be surprising.

Comments on features said to be diagnostic of Gaulish:

1. In fact, **li* does not assimilate to *ll* in Transalpine Gaulish; cf. *δουγίλιος* (RIG G-4) and *VIRILIOS* (RIG *L-4). Trans. Gaul. *allos* continues **al-no-*.
2. Transalpine Gaulish still preserves examples of the inherited *ā*-stem flexion, mostly from the earlier period, e.g. acc. sg. *ματικαν* (RIG G-151) < **-ām*, gen. sg. *αλισοντεας* (RIG G-224) < **-ās*, dat. sg. *εσκεγγαι* (RIG G-146) < **-āi*, acc. pl. *mnas* (Larzac) < **-āns*, dat. pl. *ανδοουνναβο* (RIG G-183) < **-āb^hos*. The adoption of some of the flexional desinences of the *i*-stem paradigm is an innovation not attested in Cisalpine Celtic. Owing to the chronological disparity in period of attestation, we do not know whether Cisalpine Celtic shared in this innovation.
3. The thematic dat. sg. in *-ūi* is attested in the earlier period of Transalpine Gaulish, e.g. *ουερετομαρεου* (RIG G-147), *ατεγλουουεσιου* (RIG G-163), *αδγεννου* (RIG G-208). It is often assumed that later Gaulish thematic dat. sg. *-ū* reflects the syncretism of the dative singular desinence with instr. sg. *-ū* < **-oh₁*, but this is by no means certain. Later Gaulish may have simply lost the glide, as occurred in both Latin and Greek (see Sihler 1995: 258). If this is the case, the absence of thematic dat. sg. *-ū* in Cisalpine Celtic is diagnostic of nothing, since its

corpus is attested earlier than the appearance of dat. sg. *-ū* in Transalpine Gaulish.

4. Owing to the fact that only seven verbs are attested in the Cisalpine Celtic corpora, it may simply be due to accident of attestation that no example of an *ā*-subjunctive can be exemplified. N.B. that Hispano-Celtic appears to have an example of an *ā*-subjunctive in 3. sg. pres. **āseCaTi** (MLH K.1.1).
5. In fact, the desinence *-oi*, probably a thematic nominative plural, is attested in a Cisalpine Celtic coin legend, viz. **riKoi** (see Lejeune 1971: 127). It also occurs once in an obscure form in Hispano-Celtic, viz. **oPoi** (MLH K.0.7).
6. Again, owing to the small number of verbal sequences attested in the Cisalpine Celtic corpora, it may simply be due to accident of attestation that no example of the subordinating enclitic *=jo* can be exemplified.
7. Though, as mentioned supra, Lepontic does exhibit one archetypal SOV clause, this may be due to its early attestation. A good case can be made that a somewhat later attested inscription with two verbal sequences may be underlyingly SVO, despite the fact that considerable movement has occurred at s-structure in the first clause, viz.

- a. [_{Odai} **PelKui**] [_{Oacc} **Pruiam**] [_s **Teu**] [_v **KariTe**]
- b. [_s **īsos**] [_v **KaliTe**] [_o **Palam**]

It must also be borne in mind that even Transalpine Gaulish has some examples of apparently SOV clauses, notably in the Larzac inscription (see Schmidt 1990: 18–19), which has been dated to ca. 100 CE.

It thus seems that while some variation does exist between Cisalpine Celtic and Transalpine Gaulish, much of it is probably due to the differential in the dating of the larger part of the respective corpora. There are no startling differences which demand that Lepontic be recognised as a discrete Continental Celtic language or even indicate that Cisalpine Celtic contemporaneous with the larger part of the Transalpine Gaulish corpus would have been very different from it.

A label such as ‘Lepontic’ is still useful, however, in that it clearly can be applied to a relatively small speech area. Labels such as ‘Cisalpine Celtic’, embracing both Lepontic and Cisalpine Gaulish, and ‘Transalpine Gaulish’, are useful, as well, for without them we would be reduced to treating Gaulish as a monolith, rather than recognise the variation that existed within the geographically wide-ranging Gaulish dialect continuum.

NOTES

1. As a script of Etruscan origin, the characters employed to denote plosives do not indicate voicing. They are transliterated as <P T K>, i.e. with upper case characters, to underscore this fact. Some inscriptions make use of the characters transcribed as <θ> and <χ> to introduce a voicing distinction into the dental and velar series, respectively. Whether <T> or <θ>, for example, indicates /t/, however, varies among inscriptions.

2. Textual references to collected corpora employ the following abbreviations: GLG = Marichal 1988; MLH K = Untermann 1997: 349–722; RIG E & L = Lejeune 1988; RIG G = Lejeune 1985; S = Solinas 1995. Inscriptions not yet included in a collected corpus are referred to by place of discovery.
3. In a forthcoming article, I argue that IE **p* is continued as /*ϕ*/, written <ϕ>, in two instances in earliest-attested Lepontic, but that it was soon lost thereafter.
4. A flat denti-alveolar fricative (here a geminate), perhaps articulated much like the so-called slit-*t* fricative of southern Hiberno-English, on which see Pandeli et al. (1997). This phone(me) is identical to the tau Gallicum referred to by classical authors; see my forthcoming article on the subject.
5. In my view, the vocalism of this desinence is probably after that of nom. pl. **si*Tes < **sēd-es* (perhaps after the pattern of the *i*-stems).
6. De Hoz (1990) argues that a number of forms in -*ū* in the Lepontic corpus, which have traditionally been taken to be non-neut. *n*-stem nominative singulars < **-ō*, are, instead, also thematic genitive singulars, which continue abl. sg. **-ōd*. I find this view to be unsupportable (Eska 1995: 34–37).
7. N.B. that seven of the eight Cisalpine Gaulish inscriptions are attested close to the Lepontic speech area; Lejeune (1988: 5) provides a map which indicates the location of four to the south of the Lepontic speech area. Two others, from Cureggio and Oleggio, also lie just to the south of the Lepontic speech area, while one from Voltino lies to the east, and one is an outlier at Todi in Umbria.
8. The tendency for speech varieties spoken in geographically peripheral areas to be conservative is well known.
9. N.B. that Gaul. /u/, /u:/, and /w/ are written with the digraph <ou> in Hellenic characters.

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ERRATA (Garrett, 'Adjarian's Law', BLS 24S)

Please note the following typographical errors (results of editorial font conversion):

Passim, [h] should be lowered and full-size (i.e. [ɦ]) except when used to denote stop breathiness.

Passim, 'Kar-evan' should be 'Karčevan'.

On p. 15, example (7), the form 'týsonduṛ' should be 'ṭsonduṛ' ('knee' in the Karčevan dialect).

On p. 16, example (8), the form 'go²' should be 'goł' ('thief' in Classical Armenian).

The following bibliography entries should be corrected to read as printed here:

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Adjarian's Law, the Glottalic Theory, and the Position of Armenian*

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1. Introduction

The standard reconstruction of Proto-Indo-European (PIE) posits a voiceless stop series, a voiced stop series, and a breathy or 'voiced aspirate' stop series. These are shown in (1).

(1)	I	VOICELESS	p	t	k ⁱ	k	k ^w
	II	VOICED	b	d	g ⁱ	g	g ^w
	III	BREATHY	b ^h	d ^h	g ^h	g ^h	g ^{wh}

In recent decades this reconstruction has been challenged by the 'glottalic theory', according to which the PIE series II stops were ejectives. In this theory, as seen in (2), the PIE series III stops can be reconstructed as voiced rather than breathy.

(2)	PIE STOPS	STANDARD	GLOTTALIC THEORY
	series I	voiceless	voiceless
	series II	voiced	ejective
	series III	breathy	voiced

The glottalic theory is due to Hopper (1973), Gamkrelidze & Ivanov (1973, 1995), and others; for the standard theory see e.g. Mayrhofer (1986).

One dialectological consequence of the glottalic theory is widely cited. In the standard theory, parallel consonant shifts are generally posited for two branches of Indo-European. Series I stops became aspirated voiceless stops in Germanic and Classical Armenian, series II stops became unaspirated voiceless stops, and series III stops became voiced stops.¹ This is shown in (3) for the coronals.

(3)	GERMANIC (GRIMM'S LAW)		CLASSICAL ARMENIAN	
	STANDARD	GLOTTALIC	STANDARD	GLOTTALIC
	I	*t > *th > θ	*t > *th > θ	*t > th
	II	*d > t	*t? > t	*t? > t
	III	*d ^h > d	(*d > d)	(*d > d)

Since Armenian and Germanic do not form a dialect group, it has been thought implausible that they had similar consonant shifts. The glottalic theory does not require this assumption. Instead, as also seen in (3), series III can be assumed to be continued unchanged by voiced stops in Armenian and Germanic, and for series II no devoicing need be assumed.

In short, the glottalic theory offers a new perspective on the Indo-European dialect map. According to Hopper (1973: 162), 'Germanic and Armenian are to be viewed as "relic areas" which were not affected by the general Indo-European trend to realize glottalic stops as fully voiced stops.' Gamkrelidze (1989: 117) writes in a similar vein that the PIE stop inventory 'proves to be closer to those of

languages traditionally viewed as having undergone later consonant shifts.'

In this paper I will argue against the view that dialectological evidence supports the glottalic theory. Proto-Armenian and Proto-Germanic did not have similar obstruent systems, I will claim, since the Armenian consonant shift occurred only in some dialects but not in Proto-Armenian. By itself this claim is not new, but I will add a new argument based on a sound change found in some modern dialects. This change — 'Adjarian's Law' — can be understood only if the series III stops were still breathy in Proto-Armenian. The Armenian obstruent system is thus archaic, not innovatory, and Armenian is (with Indo-Iranian) one of two IE branches that preserve the PIE breathy stops as such.

2. Armenian Consonantism

The Classical Armenian inventory of consonants and glides is given in (4).

(4)	I	ph	th	ts ^h	tʃ ^h	kh	
	II	p	t	ts	tʃ	k	
				s	ʃ	x	h
	III	b	d	dz	dʒ	g	
		v (?)		z	ʒ		
		m	n, l, ɹ, r	j		w, ɬ	

For expository convenience I will refer to stops and affricates together as 'stops'. The Armenian aspirated stops in series I are in general the reflexes of PIE series I stops, the unaspirated stops in series II reflect PIE series II stops, and the voiced stops in series III reflect PIE series III stops. These series III stops also reflect glide fortition in some cases, notably that of word-initial *g* < PIE **w*.²

The series III stops are usually interpreted as voiced for Classical Armenian and usually reconstructed as voiced for Proto-Armenian. According to a minority view, though, they were breathy in Proto-Armenian (Benveniste 1958, Vogt 1958, Gharibian 1969).³ One argument for this view is based on the fact that the reflexes of the PIE series III stops (the counterparts of the Classical Armenian series III stops) are breathy in some modern dialects. Such dialects are of types 1–2 in the scheme in (5).

(5)		SEVEN ARMENIAN DIALECT TYPES						
	PIE	1	2	3	4	5	6	7
	*t (series I)	th	th	th	th	th	th	th
	*d (series II)	d	t	d	d	d	t	t
	*d ^h (series III)	d ^h	d ^h	d	t	th	d	t

Shown here, with coronals representing other places of articulation, are the regular word-initial reflexes of PIE series I, II, and III stops in seven modern Armenian dialect types. Note that Classical Armenian, as in (3–4), was a type 6 dialect.

Representative word-initial data from Classical Armenian and three modern dialects of types 1–2 are cited in (6) from Allen (1950), Pisowicz (1976b), and

Vaux (1997, 1998). The type 1 dialect is that of Transylvania, and the type 2 dialects are those of Muš ('M') and New Julfa ('NJ').

(6)	Classical	Type 1	Type 2		PIE ancestor
II	tun	dun	M tun	'house'	*d
	tsur		M tsur	'crooked'	*gj
	kov	gov	M kov	'cow'	*g ^w
III	ban	b ^h an	M b ^h an	'word'	*b ^h
	baɪdʒɪ		NJ b ^h aɪdʒ ^h ɪ	'high'	*b ^h
	ɖnel	d ^h ənel		'to place'	*d ^h
	durn		M d ^h ur, NJ d ^h urə	'door'	*d ^h
	dʒur	dʒ ^h ur	M dʒ ^h ur	'water'	*j
	dʒern	dʒ ^h erk ^h		'hand'	*gj ^h
	gitenal	g ^h idnal	M g ^h inal	'to know'	*w

Note that breathy stops in the modern dialects correspond to Classical Armenian voiced stops (from PIE glides and series III stops).

Breathy stops in type 1–2 Armenian dialects are said to have longer-duration bursts, noisy [ʰ]–like releases, and lower F0 after release (Adjarian 1899, Allen 1950, Khachaturian 1992). These observations conform well to descriptions such as that of Ladefoged & Maddieson (1996: 58): 'breathy voiced stops in Hindi and many other Indic languages are acoustically distinguished from plain voiced stops by what happens after the release rather than by audible differences during the closure. A breathy voiced stop followed by a vowel shows an acoustically noisy but periodic interval as the glottal gesture overlaps the articulation of the vowel.' The Armenian stops in question, despite some doubts expressed in the literature, clearly fall under the 'breathy' (or 'murmured') rubric in the typology of speech sounds.

An argument from economy motivates the view that Proto-Armenian series III stops were breathy and that breathiness in type 1–2 dialects is a phonetic archaism. That is, it has seemed needlessly complex and phonetically implausible to assume a change by which series III stops, having been voiced in Proto-Armenian, became breathy (once again) in the relevant modern dialects.

Defenders of a Proto-Armenian consonant shift have raised several objections to this interpretation of modern type 1–2 dialects. One is based on glide fortition. A well-known Armenian innovation is the change of PIE *w (in onset position) to the series III velar stop. A w > g fortition is certainly natural, but a number of authors have observed that the change must instead have been *w > g^h if the series III stops were breathy in Proto-Armenian (Pisowicz 1976a: 24, Vaux 1998: 239). This has seemed less plausible. But as noted by Mark Hale (Garrett 1991: 798), a PIE *w > Proto-Armenian g^h change is the voiced version of a generally accepted

(PIE $*_{sw} >$) $*_{hw} >$ Proto-Armenian k^h change. The approximants became fricatives $*_{y^w}$ and $*_{x^w}$, I suggest, and the fricative noise was reinterpreted as (voiced) breath or (voiceless) aspiration. Note that the assumption of a $*_{w} > g^h$ change generalizes and therefore SIMPLIFIES the $*_{hw} > k^h$ change, whereas the traditionally assumed $*_{w} > g$ change is otherwise unnecessary and therefore actually COMPLICATES the historical phonology.

Dialectology suggests another objection to the view that Proto-Armenian series III stops were breathy.⁴ The type 1–2 dialects where these are now breathy, as Kortlandt (1978, 1985) and Vaux (1998) note, mostly occupy a contiguous area in the center of the Armenian linguistic area, but type 6 dialects include ‘Classical Armenian and isolated areas throughout the Armenian dialect continuum, a tell-tale sign of archaism’ (Vaux 1998: 238–39). I will return to this challenge in §6 after first assessing the evidence of a phonological process found in a number of modern dialects.

3. What Adjarian’s Law Does

Adjarian’s Law is a sound change or a set of changes whereby, in some Modern Armenian dialects, initial-syllable vowels are fronted after certain consonants. The details vary from dialect to dialect, but the low vowel is always affected ($/a/ > /æ/$) and the change is always triggered by series III stops.⁵ Adjarian’s Law has recently been discussed by Muradyan (1986) and Vaux (1992, 1996, 1998). Vaux suggests a two-step analysis which is quite persuasive for the non-low vowels: vowels became [+ATR] in the relevant contexts, and [+ATR] back vowels were then fronted. This second step has analogues elsewhere and is phonetically plausible because ‘tongue root advancement often entails fronting and raising of the tongue body’ (Vaux 1992: 282; cf. Ladefoged & Maddieson 1996: 300–306). Direct evidence for the first step is seen in modern dialects like that of Malatya. The series I and III stops have merged (as voiceless aspirates) in this type 5 dialect, but after series I stops vowels are described as more ‘open’ than after series III stops (Danielyan 1967: 47). Vaux (1998: 10) interprets this as an [ATR] difference.⁶

A few examples illustrating the application and non-application of Adjarian’s Law are given in (7–8), from the type 6 dialect of Kar-evan (Muradyan 1960) and a type 7 Karabagh dialect (Davthyan 1966). More examples could easily be added to these lists (especially if early borrowings were included).

(7) NON-APPLICATION OF ADJARIAN’S LAW

PIE	Classical	Kar-evan	Karabagh	
$*d$	tun	ton	ton	‘house’
$*g_i$	tsunı	týsonduı	tsondəı	‘knee’
	tsur	tsor	tsor	‘crooked’
$*g^w$	kov	kav	kov, kav	‘cow’

(8) EXAMPLES OF ADJARIAN'S LAW

PIE	Classical	Kar-evan	Karabagh	
*b ^h	ban	ben	pen	'speech'
	baɪdʒɪ	bəɪdʒɪ	petʃəɪ	'high'
*d ^h	dalaɪ		telaɪ	'green'
*j	dʒuɪ	dʒɪɪ	tʃɪɪ	'water'
*w	garn	gʲərnɪ	gʲærnɪ	'lamb'
	garun	gʲərunk ^h	gʲærunk ^h	'spring'
	go ²	gʲəx	kʲəx	'thief'

Note that Adjarian's Law vowel effects are conditioned by the original rather than the synchronic prevocalic consonant; the contrast between series II and III stops is neutralized in type 7 dialects.

4. What Adjarian's Law Reveals

What phonetic factors could be responsible for Adjarian's Law? Consonants often affect vowels: coronals may cause vowel fronting, for instance, or a voicing contrast may be reinterpreted as a tone contrast. The vowel effects in data like (7), however, conform to neither pattern. These effects (or the [ATR] antecedents Vaux reconstructs) must have some basically coarticulatory cause. In this section I will consider two analyses of this sort.

Vaux himself proposes that Adjarian's Law is 'a case of voiced consonants spreading some feature to following vowels' (1992: 274), the relevant feature being [ATR]. In Adjarian's Law dialects, that is, voiced stops have triggered tongue root advancement. Vaux (1996: 178–79) offers the following explanation: 'Phoneticians have long known that advancement of the tongue root is necessary to produce voicing in stop consonants ... By assuming that this ... is reflected in the phonology as a [+ATR] specification, we directly account for all of the processes discussed'

There are two strong arguments against this view that voicing was the cause of Adjarian's Law. The first is typological. Distinctive voicing is extremely common, but changes where voicing triggers (or is reinterpreted as) [ATR] or vowel fronting are essentially unknown. Several possible examples are adduced by Vaux, but none is convincing.⁷ If this were in fact a possible kind of sound change, a respectable number of unambiguous cases should exist.

The second argument is phonetic. It is not true that phonologically voiced stops require tongue root advancement. Ladefoged & Maddieson (1996: 50–51) comment as follows:

[M]aneuvers that can be made to assist the continuation of vocal fold vibration during an oral stop closure ... include a relaxation of the cheeks and other soft tissues around the oropharyngeal cavity so that the pressure will passively expand the volume, as well as active

gestures, such as moving the articulatory constriction forwards during the closure, moving the root of the tongue forwards, lowering the jaw, or lowering the larynx ... Some English speakers utilize such gestures to a sufficient degree to produce vocal fold vibration during their voiced stop closures ... but similar gestures are often executed by speakers producing intervocalic phonologically voiced stops without sustained vocal fold vibration ... The target for voiced stops in English can ... be said to include the maintenance of a position of the vocal folds appropriate for voicing, but not to require the employment of other strategies to sustain vocal fold vibration.

Contrary to Vaux's claim, that is, not all languages maintain voicing during the closure of a 'voiced' stop (other cues may suffice), and not all languages which do maintain voicing use tongue root advancement. Without secure parallels or a clear phonetic basis, we must abandon the hypothesis that voicing triggered Adjarian's Law.

An alternative hypothesis is justified both phonetically and typologically. This is the hypothesis that breathiness caused Adjarian's Law: at the time of the change, the trigger consonants were breathy. I suggest the changes informally stated in (9).

- (9) CHANGE #1A: a > æ / # breathy C ____
 CHANGE #1B: V > [+ATR] / # breathy C ____
 CHANGE #2: [+ATR] > [-back]

Change #2 is due to Vaux, of course; only the two parts of change #1 are new. A more accurate statement might simply refer to allophonically breathy vowels.

Change #1 in (9) is subdivided because the /a/ > /æ/ change is not only the core case of Adjarian's Law but one where English evidence may be relevant. In a classic investigation of English glides, Lehiste (1964: 148) reported the data in (10).

(10)	AVERAGE F2 (IN HZ)			AVERAGE F2 (IN HZ)		
	VOWEL	GENERAL	AFTER /h/	VOWEL	GENERAL	AFTER /h/
	[i]	2200	2240 (+ 40)	[u]	895	820 (– 75)
	[ɪ]	1750	1860(+ 110)	[ʊ]	980	990 (+ 10)
	[eɪ]	2015	2135(+ 120)	[oʊ]	960	705 (– 255)
	[ɛ]	1610	1760(+ 150)	[ɔ]	880	845 (– 35)
	[æ]	1570	1630 (+ 60)	[ɑ]	1110	1155 (+ 45)

Shown here is the acoustic effect of /h/ on a following vowel — in particular on F2 (i.e. fronting in acoustic space; note that English /h/ is often realized phonetically as [h̠]). A notable effect is seen here with the front vowels and the low back vowel /a/. The same effect may lie at the root of the Adjarian's Law /a/ > /æ/ change.

Change #1b in (9), whereby contextually breathy vowels became [+ATR], may well have a phonetic explanation along the lines proposed by Vaux in his attempt to connect voicing and tongue root advancement. Voicing need not be maintained during a stop closure, but breathiness must be produced in the release

of a breathy stop. The vocal folds are farther apart during such a release than during that of a modally voiced stop, and so, to ensure enough airflow to maintain breathiness, the transglottal pressure drop must be higher. This goal can be assisted by tongue root advancement (and by some of the other articulatory gestures cited above).

From the typological point of view, interactions between breathiness and [ATR] are not at all unusual. For example, [+ATR] vowels are often perceived as breathy. Ladefoged & Maddieson (1996: 300) report that Akan [+ATR] and [-ATR] vowels differ 'not simply in the tongue root gesture, but in the enlargement of the whole pharyngeal cavity, partly by the movement of the tongue root, but also by the lowering of the larynx' in the [+ATR] vowels, which 'sometimes results in these vowels having a slightly breathy quality.' A related effect has been phonologized in a Utah English dialect, where the 'tense' vs. 'lax' vowel contrast has been replaced by a breathiness contrast in certain contexts (Di Paolo & Faber 1990, Faber 1992).

Comparable effects are also seen in the other (breathiness > [+ATR]) direction. Javanese slack voice (i.e. semi-breathy) stops, according to Ladefoged & Maddieson (1996: 64), 'exhibit a lowered F1, indicating that larynx lowering occurs. In vowels following these stops, there is a lower F0, and a reduction of energy in the upper frequency range of the spectrum, a notable acoustic property of vowels with slack or breathy voice' The lowered-F1 effect here described is the acoustic basis for the breathiness > [+ATR] change proposed in (9) above.

The clearest Adjarian's Law trigger other than a stop suggests another argument that breathiness rather than voice was the phonetic cause of the change. As shown by Weitenberg (1986), Adjarian's Law also affected the sequence /ja/ > /ħa/, which has become /ħæ/ (or the like) in the relevant modern dialects. Some examples are given in (11).

(11)	Classical Armenian	Muš (type 2)	Šatakh (type 7)	Meghri (type 6)	Cilician and Syrian (type 4)	
	jaɬthel	ħaxtel	ħæxthel	éxthil		'conquer'
	jaradz	ħaredz	ħærætʃ	éredz		'before'
	jaid	(ħeid)	ħæɪth		Sv irth	'straw'
	jarak				MA heɾag	'lasting'
	jam				MA hem	'delay'
	jamel				Sv imil	'to delay'

The Muš, Šatakh, and Meghri data are cited from Weitenberg (1986); the Cilician and Syrian data are from the dialect of Svedia (Andreasyan 1967) and from Middle Armenian (Karst 1901); the Muš dialect has not undergone Adjarian's Law and is cited for comparison only. Note that ^h has been lost in Meghri and Svedia and had merged with *h* in Middle Armenian.

A /ħa/ > /ħæ/ change is of course hard to explain if Adjarian's Law was caused by the aerodynamic requirements of voiced stops. But if breathiness was

the cause, it is undeniably natural for a segment that is essentially nothing but breathiness to trigger the change. For this reason, and for the reasons stated above and below, I conclude that Adjarian's Law was originally triggered by breathy (not by modally voiced) obstruents.

5. The Dialectology of Breathiness

The analysis of Adjarian's Law proposed above is supported by its dialectological distribution. The change is attested in type 6–7 dialects, in type 4 dialects as cited in (11), and (as an [ATR] alternation only) in the type 5 Malatya dialect. Crucially, it is not found in dialects where the series III stops are breathy. Muradyan (1986: 29) argues that breathy stops cannot have triggered Adjarian's Law, 'since in those dialects where such sounds exist or existed, no palatalization of *a* is registered.' But the absence of Adjarian's Law in dialects with breathy series III stops is entirely consistent with my analysis. A well-known property of assimilatory sound changes (like umlaut) is that they often occur together with the loss or neutralization of their conditioning environment. Ohala (1993: 255) explains that 'failure to detect [this] environment is a direct cause of the listener failing to implement correction of a contextually caused perturbation.' If a reinterpretation of breathiness caused Adjarian's Law, we therefore expect the change to be phonologized only where this phonetic feature has been lost.

A related dialectological consideration argues against Vaux's interpretation of Adjarian's Law. If the vowel change were an effect of stop voicing, any voiced stop should be a potential trigger. In fact, only series III stops trigger Adjarian's Law, never series II stops — even in dialects where these are voiced. Thus, in the Cilician Middle Armenian dialect cited in (11), Adjarian's Law was triggered by *h* (which evidently later merged with *h*) but not by any stop. Series II stops were voiced in this type 4 dialect, and series III stops were voiceless, but neither caused any vowel fronting. This can be explained if stop breathiness (but not *h*) was lost in Cilicia before Adjarian's Law arose. In Malatya, the series I and III stops have merged and vowels after the latter are evidently [+ATR]. The series II stops are voiced in this type 5 dialect, but it is the series III stops (voiceless aspirates, synchronically) that have triggered the first step in Adjarian's Law. Such facts are merely coincidental if Adjarian's Law was caused by stop voicing, but if breathiness was the crucial factor they have a principled explanation.

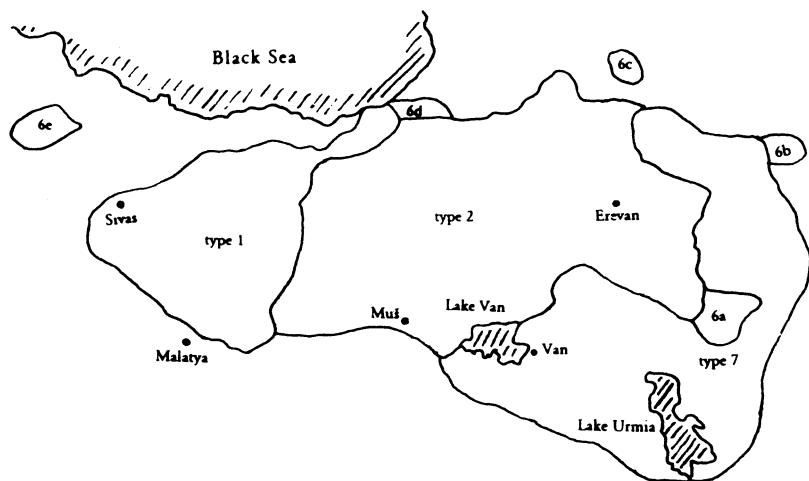
6. Conclusion

I have argued in §§4–5 that Adjarian's Law vowel fronting is caused by breathiness, not voicing. This in turn has significant implications for the reconstruction of the Proto-Armenian obstruent system. In dialects where stops trigger Adjarian's Law, these stops must have been breathy when the change originated. The proposed interpretation of Adjarian's Law thus opens a phonetic window on earlier stages of certain Armenian dialects. Through this window we

see breathy series III stops not only in type 1–2 dialects (today) but also (formerly) in dialects where the series III stops have triggered Adjarian's Law. Among these are precisely the dialects of type 6 whose geographical noncontiguity suggested archaism to Kortlandt and Vaux (cited in §2). In these dialects, the presence of Adjarian's Law proves that series III stops were formerly breathy and have only relatively recently become plain voiced stops.

An Armenian dialect map will make these points somewhat clearer. The rough partial map given below is based on the map in Gharibian (1969). Shown here are the central and eastern parts of the Armenian linguistic area. The areas of the map occupied by dialects of types 1–2 are shown; such dialects are also documented in New Julfa (in Iran) and in Transylvania and Ukraine.⁸ Also labelled below are the continuous area where type 7 dialects are found and the discontinuous areas of type 6. Adjarian's Law is found throughout the type 7 area and in two of the type 6 areas: those labelled '6a' (Agulis, Kar-evan, Meghri, etc.) and '6b' (Ares').⁹

On the proposed analysis of Adjarian's Law, the type 7 dialect area and the '6a' and '6b' areas (as well as Malatya at least) can all be added to the type 1–2 areas as territory where breathy series III stops are securely documented or inferrable. This result strengthens the view that the series III stops were breathy in Proto-Armenian — a significant archaism from the PIE perspective — and that Proto-Armenian had no Germanic-style consonant shift. Insofar as it invokes this alleged parallelism between Armenian and Germanic, the glottalic theory of PIE consonantism hence loses a potential dialectological prop.



Notes

* For criticism and discussion I am grateful to the BLS audience and (though they may not accept my argument) to Juliette Blevins, Ian Maddieson, John Ohala, and Bert Vaux. All transcriptions use IPA, but breathy consonants are written *C^h*.

¹ Strictly speaking, glottalic-theory advocates may assume that the putative PIE ejectives remained intact in Armenian, since their reflexes are ejectives in some modern dialects. I ignore these modern ejectives here: they can be viewed either (in the glottalic theory) as archaisms retained under the influence of neighboring non-IE languages with ejectives or (in the standard theory) as innovations due to the same influence. See also Pisowicz 1988.

² Word-initial voiced fricatives do not occur in native vocabulary. (For overviews of the historical phonology see Meillet 1936 and Schmidt 1981.)

³ Whether this was also true of Classical Armenian is a distinct question; the literary language 'Classical Armenian' may well not have had a single uniform pronunciation. I ignore as implausible and unnecessary the compromise analysis of Pisowicz (1976a, 1997), who contends that a consonant shift did occur in Proto-Armenian and that after the Classical Armenian period the series III voiced obstruents became breathy in the ancestor(s) of all modern dialects.

⁴ A third objection is based on loanwords: in early borrowings from Greek and Iranian, voiced stops are systematically borrowed as Armenian series III stops, not series II stops (Pisowicz 1976a: 21–24). But the Greek voiced 'stops' were probably fricatives at the time of linguistic contact with Armenian, and it may make sense for (noisy) fricatives to be borrowed as breathy stops. Moreover, it may be unnecessary to assume that the relevant Armenian dialect differences postdate Greek and Iranian borrowing; breathiness might have been lost relatively early in some dialects through which loans entered the language (though not in Adjarian's Law dialects, for reasons discussed below).

⁵ Other consonantal triggers have been proposed. The best established of these is *h*, discussed in §4 below, but *l* and the voiced fricatives have also been suggested (e.g. by Vaux 1992, but without detailed exemplification; as he notes, his analysis of Adjarian's Law fails to account for these triggers satisfactorily).

⁶ It should be noted for the record, in connection with the (sometimes overused) term 'ATR', that there is no direct phonetic evidence of tongue root advancement (or retraction) as an articulatory correlate of the Armenian phonological categories under discussion.

⁷ See Vaux (1992, 1996, 1998: 177–78). These putative examples are of three main types. First, in Babine, what Vaux treats as a 'voicing' contrast is a contrast between aspirated and unaspirated voiceless obstruents, written as in standard Athapaskanist practice with purely orthographic voicing. Second, in Buchan Scots English, the relation between voicing and vowel height is not of the alleged type: voiced obstruents block a vowel height harmony process that extends from stressed vowels to following unstressed vowels, but otherwise voicing has no vowel height or [ATR] effects. (I take the difference between triggering and blocking a process to be significant.) Third, in some mainland and insular Southeast Asian languages, consonant voicing does seem to be associated with vowel tongue root advancement, but there is also synchronic or comparative evidence for breathiness in these cases; breathiness is discussed below.

⁸ According to Pisowicz (1976a: 47–51), the New Julfa dialect reflects a seventeenth-century (forced) settlement from Julfa, which is in the type 2 territory on the map above, and the Transylvanian and Ukrainian dialects both reflect settlement from the Crimea. Outside the map, therefore, there is only one dialectologically archaic area where the series III stops are documented as breathy.

⁹ Because Lusenc (1982) is unavailable to me, I am not certain that Areš has an Adjarian's Law dialect. It probably does, and I include it here, because it is geographically surrounded by Adjarian's Law dialects and because the data cited by Vaux (1998: 182) are consistent with this interpretation. Also labelled on the map are the type 6 dialects of Tiflis ('6c'), Artvin ('6d'), and

Amasia ('6e'). As applied to these dialects, the inference of archaism from geographical discontinuity is less appealing than usual: according to Pisowicz (1976b: 200–202), the Tiflis and Artvin dialects are transitional or intermediate between types 2 and 6 (which in principle differ only in their breathy vs. plain voiced realizations of series III stops). Enough local and lexical variation is described to force the inference of separate developments (i.e. breathy > plain voiced shifts) in any case.

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The Dialectal Position of Anatolian within Indo-European

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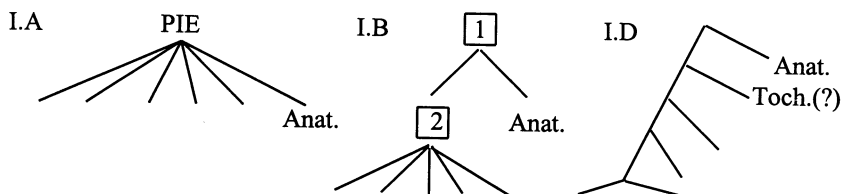
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More than eighty years after the identification by Hrozný of Hittite as an Indo-European language, the question remains open of how we are to best integrate the facts of Hittite (Anatolian)¹ into our overall picture of Indo-European. The same remark applies to Tocharian, but for various reasons—some valid, some not—the question of the dialectal status of the latter has not achieved the same prominence. We will have occasion to return to this point later. Despite the understandable impatience of some colleagues, who are weary of yet one more discussion of the “Indo-Hittite” question, the issue will not go away. Until we come to a consensus regarding the position of Anatolian—and the related question of to what extent we must modify our reconstruction of Proto-Indo-European itself—even those whose focus is on the history of other subbranches risk basing their analyses on a proto-system that may suddenly be invalidated.

The following remarks are divided into three unequal parts: a larger section dealing with conceptual and methodological issues; a short cautionary dissent to what I see as a developing consensus; and a mercifully short version of my now standard sermon on the importance of using *all* the available Anatolian data in deciding the question of the subbranch’s dialectal position.

There have been to my knowledge four basic conceptual approaches to the issue of relating Anatolian to the rest of Indo-European. The most prominent of these over the past half-century has been that Anatolian is merely one more subbranch of PIE like any other. This schema is represented in terms of the family-tree model in Figure I.A. This point of view, often termed the *Schwundhypothese*, is exemplified by the treatments of Pedersen (1945:190f) and Eichner (1975:100ff), among many others. As the label ‘loss hypothesis’ implies, this point of view assumes that Anatolian inherited essentially all of the formal and functional categories of traditional, “classical” (“Brugmannian”) PIE, and that their absence in Anatolian is due to loss. As one would expect based on their overall oeuvre, the version of this approach advocated by Pedersen and Eichner actually is quite nuanced and sophisticated. Both scholars explicitly make clear that the development to Anatolian (and specifically to Hittite) is far more complex than a simple loss of categories (Eichner 1975:73 speaks of *Umschichtung und Neugliederung*). It is my perception that this point of view, dominant in Europe for more than half a century, has recently lost ground (for the basis of this judgment see below). There are nevertheless still respected, mainstream specialists

who defend it: Eichner himself, e.g., presented this point of view at the Pedersen Kolloquium in Copenhagen in 1992.²



The second most famous model is that which views Anatolian as a collateral branch of PIE, as illustrated in Figure I.B. The best-known exemplar of this approach is the “Indo-Hittite” hypothesis of E. H. Sturtevant: see e.g. Sturtevant (1933a) and (1933b:29-33). As per the late Warren Cowgill, however, the labeling of the nodes numbered 1 and 2 in figure I.B is a point of decidedly secondary importance. As also stressed by Eichner (1975:72), it matters little whether one labels node 1 “Indo-Hittite” and node 2 “Indo-European”, or prefers to call node 1 “Indo-European” and invents a new term for node 2 (Eichner ventures *Rest-indogermanisch*). The crucial point is the claim that Anatolian did not share in a significant set of innovations common to the rest of the Indo-European languages. These are absent in Anatolian not because of loss, but because these features never existed in the prestages of Anatolian. This viewpoint usually implies the passage of at least a millennium between stages 1 and 2, but strictly speaking this assumption is not necessary, and not all adherents of this model commit themselves on the thorny issue of the speed of linguistic change. This account, never popular in Europe, now has relatively few proponents, but see Lehrman (1996). In essence, such a scenario is also presupposed by the very original theories of Adrados (1982:1-4 and elsewhere), although he does not frame the issues in family-tree terms.

A third approach is to claim that Anatolian is an archaic descendant of a PIE that must be radically revised vis-à-vis the “classical” reconstruction. It is somewhat difficult to compare this model with those cited above because it typically is presented in a framework that either is explicitly not that of the family-tree schema or one that is very vague as to relative chronologies. See among others Watkins 1969, Meid 1975:216, Neu 1976:243 and 1985, Drinka 1988:254ff (the last not in family-tree terms!). However, Meid (1988:11) explicitly places Hittite in a geographically central group extending roughly northeast to southwest that shows some “middle Indo-European” innovations versus those dialects to the east (Indo-Iranian and Greek) and to the west (Celtic and Germanic). This point of view became quite popular in the field in the sixties, and I believe it is fair to say that the principal debate for the succeeding thirty

years was between those who defended the schema of I.A and those who asserted that only a radical revision of PIE could accommodate the facts of Anatolian. I do not mean thereby to say that proponents of I.B did not continue to exist, but they were distinctly in the minority.

A fourth alternative that appears to have gained widespread acceptance in recent years is that which says that Anatolian was the first subgroup to “separate” from PIE (note the implicit family-tree conception). In some cases (e.g. Oettinger 1986:25), there is an explicit claim that the time-depth from PIE to the “separation” of Anatolian is quite shallow (a matter of a few generations). With or without this specification, what is common to this approach is the idea that the common innovations shared by the non-Anatolian subgroups consist not in the wholesale creation of grammatical categories (feminine gender, optative or subjunctive mood), but rather in the development of new formal expressions of existing categories, or reinterpretation of the latter: see for example Jasanoff (1994:167) on the aorist or Strunk (1994:430f) on the development of aspect from *aktionsart*. The same basic conclusion is also reflected in the dialectal stemma of Hamp (1984:153), although his criteria are not necessarily the same.

The debate just outlined involves conceptual issues as well as concrete facts. In a term paper written as a student thirty years ago for a class taught by Anthony Arlotta at Harvard, I referred to the possibility of “early separation” of Hittite. He dismissed this idea with the comment that the question of early or late was irrelevant. This remark reflects the dominant view in the U.S. of the family-tree model, namely what I may term the “sunburst” version illustrated in Figure I.A. As indicated explicitly by Bloomfield (1933:312), this conception of the family tree forgoes any claim of historicity in terms of break-up of a proto-speech community. It is merely a convenient abstract representation of the “genetic” relationships of the languages being described, with a number of unreal elements consciously built in.

While I have not yet found a diagram of this version of the family tree in a Continental publication, there is no doubt that Pedersen and Eichner share this conception in advocating model I.A. I quote Eichner (1975:72): “Eine Abweichung von diesem Alternativgefüge [i.e., I.A vs. I.B—HCM] verbieten die sprachlichen Fakten, einen Kompromiß zwischen den beiden Alternativen verbietet die Logik”. I believe that a number of colleagues would vigorously dispute both parts of this extraordinary statement. The first claim is true only if one thinks exclusively in family-tree terms. The second applies only if one adheres to the version of the family tree in I.A. I will never forget the shock I experienced when I first found August Schleicher’s original family tree (Schleicher 1871:9), with its much more naturalistic appearance, produced by the (historically plausible) assumption that

first one language group and then another separated from the common speech community. This conception of the family tree has persisted, both in the U.S. and abroad (see by way of example Hockett 1958:519, Lehmann 1962:139, Cejador y Frauca 1911:323, Tagliavini 1969:408). Obviously, approach I.D. to the issue of the position of Anatolian implies such a viewpoint.

Contrary to my expectations when I began research for this paper, I (re)discovered that approach I.D. was actually the *first* popular response to the new evidence of Anatolian! Emil Forrer (1922:26f) proposed such a schema, but with the unique twist that he viewed Luvian as the first subgroup to branch off, followed by Hittite, and then the rest of Indo-European (see also the approval by Kretschmer 1925:301, who threw in Etruscan for good measure). A similar view was presented by Ungnad (1923:3-4), but with more emphasis on Lycian. To return to more mainstream ideas, Meillet (1931:2-5), in a paper famous mostly for its description of the rise of the feminine gender in PIE, proposed that what he termed “marginal” languages (Hittite, Tocharian, Italo-Celtic, and Armenian) separated from the others before the development of the feminine gender and the loss of the “r”-middle. Finally, Petersen (1933) argued that Hittite and Tocharian were the first branches to “leave” the proto-speech community—a position now espoused by several scholars.

Based on a number of published works, including those by Jasanoff, Oettinger, and Strunk already cited above, and on the tenor of discussions at the meetings of the *Indogermanische Gesellschaft* in Copenhagen and Zürich in 1992, I now conclude that there is a growing consensus among many in favor of model I.D. The remaining debate seems to center on the question of just how radically we should revise our reconstruction of the proto-language at the top node of the diagram (whether we still term this “Indo-European” or something else), in order to account for the archaisms of Anatolian (and Tocharian). This debate involves quite major and substantive points, but it is taking place largely in a context where two things are now taken as more or less established: (1) model I.D. best represents the relationship of Anatolian and Tocharian to the rest of the family, not I.A. or I.B; (2) as intimated above, the innovations shared by the languages other than Anatolian and Tocharian involve mostly formal innovations and readjustments of existing grammatical categories, not development of entirely new ones. Once again I am making gross generalizations and do not mean to suggest that other viewpoints (including I.A. and I.B.) do not exist in the field.

I view the development just described as generally quite positive for the field. Whereas there was little hope for any kind of definitive decision between the irreconcilably opposing views of I.A. and I.B. (and none for a compromise, as per Eichner), the consensus for some form of I.D. permits useful debate on the

specifics of its realization. I personally think that some version of I.D is the likeliest solution to the problem of integrating Anatolian (and Tocharian) into Indo-European. Although I played devil's advocate in raising another possibility, it seems clear that my own recent analysis of the feminine gender in Anatolian (Melchert 1994), if accepted, is most easily explained in terms of a common non-Anatolian innovation in which the already existing feminine gender underwent a major formal adjustment.

I am concerned, however, that a “bandwagon” effect may lead to a rush to judgment. In particular, the *presumptive* “early separation” of Anatolian and Tocharian begs the important question of whether *all* features shared by Anatolian (and/or Tocharian) with western Indo-European dialects can be explained as archaisms. The growing dominance of the model I.D has apparently led some to dismiss out of hand any possibility that such shared features might be innovations, since this idea would be incompatible with the now favored view of early separation of Anatolian and Tocharian. I emphasize that I know of no “smoking gun”—a shared feature that *must* be interpreted as an innovation. However, several do seem to me arguable (e.g., the “r”-middle, the use of the interrogative stem **k*“o/i- as a relative). I refer the reader to the works of Pedersen (1925:43f, 51f), Kammenhuber (1961:69ff), Melchert (1994:242), and especially Puhvel (1994:passim), whose arguments on the basis of shared *structured sets* of lexical isoglosses have not received the attention I feel they deserve. In sum, I would like to see a genuine debate on this issue, not a summary dismissal based on the prejudice that I.D makes shared innovations unthinkable. I note finally that shared innovations between Anatolian (or Tocharian) and the western dialects only stand in absolute contradiction to early separation if one thinks solely in family-tree terms. If one regards the issue in terms of dialect geography, nothing precludes some shared innovations with the west followed by relatively early isolation (cf. the remarks of Puhvel 1994:317).

With the indulgence of colleagues who have heard my rantings on the topic before, I must also repeat in this forum my insistence that the debate about the dialectal position of Anatolian *must* henceforth be informed by all the available evidence from the subfamily, not just that from Hittite. We must never forget the fact that attested (Old) Hittite is the product of a considerable historical development from the common pre-stage we may call Proto-Anatolian, during which it underwent an undetermined number of innovations. Yet it is Proto-Anatolian that must be taken as the point of comparison in considering the relationship of the subgroup to the rest of Indo-European. To address this issue, and to ensure that you take away from my presentation at least some useful new data if nothing else, I close with mention of two features whose status in Anatolian has been underappreciated or totally overlooked.

First, as already pointed out by Mittelberger (1966:104) and reiterated by Bader (1991:139f et aliter), there exists in Anatolian beside the thematic genitive singular in *-as* < **-os* (Hittite, Palaic and Hieroglyphic Luvian) also an ending that surely reflects **-e/oso* (Hieroglyphic Luvian and Lycian). I also make bold to suggest that the Carian ending *-s*, with the synchronic function of a dative (perhaps also still of a genitive) belongs here as well (on the function of the ending see Schürr: forthcoming). Much less certain but also worthy of consideration is the possibility that Hieroglyphic Luvian genitive singular */-asi/* continues apocopated **-osyo*.

Second, I have recently assembled evidence (Melchert: forthcoming) that there are remnants in Hittite and Cuneiform Luvian showing that Anatolian did inherit the aspectual contrast of imperfective vs. perfective ("present" vs. "aorist"), not merely the formal markers of these categories in the pre-aspectual guise of aktionsarten (as argued by Lehrman 1985:62ff or Strunk 1994). The evidence is sparse, and it remains to be seen whether my analysis wins acceptance. The potential ramifications of my results for the dialectal position of Anatolian are self-evident.

I hope to have persuaded you that the issue of the dialectal position of Anatolian within Indo-European remains a vital one, both informing and being informed by the more general debate about the nature of linguistic reconstruction and the status of genetic relationship of languages and the various models we employ to elucidate it. We may hope that additional data and more successful exploitation of existing knowledge will lead to further refinements both in our vision of inner Indo-European relationships and in our practice of the methods on which our discipline depends.

Notes

¹ Although the existence of an Anatolian subfamily has been recognized for more than sixty years, most discussions of the problem have framed it in terms of Hittite. In order to avoid needless repetition, I will use either Hittite or Anatolian interchangeably according to the usage of the scholar cited, except where explicitly noted.

² Unfortunately, a written version of his oral presentation was not published in the proceedings of the conference.

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Some Consequences of a New Proposal for Subgrouping the IE Family
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This paper will discuss some consequences of the new proposal for subgrouping the Indo-European (IE) family that has emerged from recent work in computational cladistics by Warnow, Taylor, and Ringe. (The methodology itself is not discussed here; see our papers in the bibliography.) The tree in fig. 1 (following the footnotes) is our optimal tree, revised to date; I will assume for the sake of argument that this tree will turn out to be the true tree.

The most obvious consequence is the one implied by the labels of the non-terminal nodes toward the top of the tree. If this is the true tree, then, genetically speaking, Anatolian is half the family. What is more, Tocharian is half of the non-Anatolian subgroup, which I will call 'IE proper'; Italo-Celtic is half of the remainder of that, which I will call 'Nuclear IE'; and it is not until we reach what I have called the 'core' of the family that we find a really rich and diverse pattern of branching. (It is always possible to posit binary branchings among the core subgroups for which we have linguistic information adequate for subgrouping, if certain additional hypotheses are made—namely, the hypotheses of contact expressed by the double-headed arrows. Whether that SHOULD be done is a question I can't address here; therefore I will treat the core as an undifferentiated unit, focussing on the branchings further up the tree.)

It follows automatically that nothing can be reconstructed for Proto-Indo-Hittite (PIH) unless it is attested in Anatolian and at least one other branch; that nothing can be reconstructed for PIE proper unless it is attested in either Anatolian or Tocharian and at least one other branch; and that nothing can be reconstructed for Nuclear IE unless it is attested in Anatolian, Tocharian, or Italo-Celtic (i.e. Italic or Celtic or both) and at least one other branch—and if there WAS very early contact between those branches and Germanic, then at least some features shared only by Germanic and Italo-Celtic have to be excluded. All remaining shared material need be no older than the last common ancestor of the core languages. In particular, note that a feature shared by Greek and Indo-Iranian need not be older than the parent of the core.

This has interesting implications for our reconstruction of IE verb morphology, especially for what I have come to think of as the 'thematic complex'; I will concentrate on that question in the remainder of this paper.

As is well known, there are a few types of thematic verb stems that are unarguably reconstructable for PIH:

stems in *-ské/o- (productive imperfectives in Anatolian; perhaps originally iterative, e.g. in *g^wṛskéti 'keeps stepping, walks', *ǵnh₃skéti 'recognizes (every time (s)he sees (it))', *pr̥skéti 'keeps asking')

stems in *-ye/o- (primary: cf. Hitt. *weriezzi* 'calls' = Hom. Gk. εἶπει 'says' < *wéryeti, root *werh₁- 'say' with regular loss of laryngeal in /C_y)

stems in *-yé/ó- (some primary: cf. Hitt. *tāiezzi* ‘steals’ = OCS *tajetŭ* (oxytone, cf. Russ. *tajít*) ‘conceals’ < *teh₂yéti—see Melchert 1994:130 on the accent of the Hittite form; some denominative, e.g. Hitt. *gemaniezzi* ‘spends the winter’, *kappuezzi* ‘counts’)

stems in *-éye/o- (causative: cf. Hitt. *wassezzi* = Skt. *vāsáyati* = Goth. *wasjip* < *woséyeti ‘dresses’, caus. of *wéstor ‘wears’)

All these types are characterized by suffixes ending in the thematic vowel.

In a large part of the family we also find ‘simple thematic’ stems, in which the stem-final thematic vowel is not obviously part of a stem-forming suffix, being either apparently functionless or a mood suffix (marking the subjunctive); but the distribution of such stems across branches is much more uneven.

The clearest case is the thematic aorists.¹ In 1960 George Cardona demonstrated that such a category need not be reconstructed for PIE. Most thematic aorists attested in any branch that have stem-cognates in some other branch can be shown to reflect athematic aorists—that is, they have been secondarily thematized; typical examples include:

Gk. ἔλιπε, Arm. *elik^h* < *élik^wed (see Ringe 1997 on *-d = */-t/), but Lat. *līquit* reflects *leyk^w-; thus the PIE stem must have been ablauting, hence athematic: 3sg. *léyk^wt ‘(s)he left (it)’, 3pl. *lik^wénd, etc.

Osc. *kúmbened* ‘convēnit’, but Skt. 3sg. *ágan*, 3pl. *ágman*, reflecting PIE *g^wémd ‘(s)he took a step’, 3pl. *g^wménd

The same process can be posited for the remainder of the class. If we examine the overall distribution of thematized aorists across the subgroups, the following pattern emerges.

Anatolian: no stems reflecting thematic aorists

Tocharian: TB *lac*, TA *lāc* < PT *lēcá ‘(s)he went out’ < *h₁lud^héd ‘(s)he arrived’, with good cognates elsewhere (see below)

TB *śem* ‘(s)he came’, 3pl. *kamem*, clearly thematized within the history of Tocharian (see in general the discussion of Pinault 1994:184-204)

Celtic: OIr. *luid* ‘(s)he went’ (and compounds) < *h₁lud^héd ‘(s)he arrived’

—other suffixless preterites reflect thematization within the history of Celtic, e.g. OIr. *boí* ‘(s)he was’ < *buwed ←< PIE *b^húHd ‘(s)he became’ (Skt. *ábhūt*, etc.; see McCone 1991:129-33)

Italic: OLat. *fēced* ‘(s)he made’ < *d^heh₁ked ‘(s)he put’, with arguable cognates elsewhere (but see below!)

—other examples reflect thematization within the history of Italic or its subgroups (cf. Osc. *kúmbened* above); Lat. *iēcit* ‘(s)he threw’ (≈ Gk. ἤκε ‘(s)he sent forth’) is of course suspect as a potential rhyme-formation to *fēcit*

the core: well attested in Greek, Armenian, Indo-Iranian, Slavic (the aorist has been lost in Gmc., the system remodelled in Baltic)

—cf. in particular Gk. (Hom.) ἤλυθε ‘(s)he came’ < *éh₁lud^hed; reduplicated ἔ(f)ειπε = Skt. *ávocat* < *é-we-wk-e-d, root *wek^w- (underlying *k^w re-

stored on the surface at least in Greek); ἔθηκε '(s)he put' = OLat. *fēcēd* < *éd^heh₁ked (and cf. Late Phrygian ἀδδακετ 'afficit')?? (But ἔθηκε is really 'alphathematic'; cf. also archaic Boiotian and Phokian ἀνεθεῖ '(s)he dedicated' (see Dubois 1986 with refs.), and note that the creation of a mixed paradigm is much easier to understand if the aorist with *-k- was ATHEMATIC (Kimball 1991:150-1).)

Thus none are reconstructable for PIH; only *h₁lud^héd is reconstructable for PIE proper; and it is very doubtful that *d^heh₁ked is reconstructable for NIE (in competition with *d^héh₁d, inherited from PIH; cf. Hitt. *tēzzi* 'says', see Melchert 1994: 103 with references). Only in the core languages do we find, PERHAPS, a greater number of thematized aorists that could have been thematized before the individual histories of the surviving branches.

The case of the 'short-vowelled' subjunctive—that is, of those thematic extensions of athematic stems which in NIE express future time, hypotheses, and the like—is similar, but more of its development occurred before PIE proper had diversified much. We find the following distribution of stems.

Anatolian: no category 'subjunctive'

Tocharian: thirty-odd subjunctives in *-e/o-,² but only two with clear cognates in other branches:

TB *śamtsi* 'to come', *śämt* 'you will come', TA *śmāṣ* '(s)he will come', *śmeñc* and mid. *śmantrā* 'they will come' < PT *śam^yətsi, *śam^yəṭə, *śam^yə(ṣə), *śəmən (*-ēñcə), *śəmēntər < aor. subj. *g^wém-e/o-, cf. Skt. *gámati*, -*anti*

TB *kantār* 'it will be fulfilled', probably < PT *kǎñtər < aor. subj. *génh₁-e-tor '(s)he will be born' with typical analogical depalatalization of the root-initial consonant (see Hackstein 1995:232-4; remodelled in Gk. γένηται)

—note that many Tocharian subjunctive stems are, or were originally, present stems used also as subjunctives (a major pattern of verb inflection in Tocharian, Winter 1977:136)

Celtic: well-attested in the OIr. s-subjunctive (← s-aorist subj., pace Watkins 1962:124-7, cf. McCone 1991:55-83) and the subjunctive of 'be'

Italic: well-attested in Lat. fut. *erit* and -*bit*, the perfect subjunctive, the OLat. type *faxō*, etc; note further that the 'long-vowelled' subjunctive (i.e. the subjunctive in *-ē/ō- of thematic stems in *-e/o-), which is well-attested in the Latin future, presupposes the short-vowelled type

the core: both short- and long-vowelled types well-attested in Greek and Indo-Iranian

Thus none are reconstructable for PIH, and only *g^wémeti and *génh₁etor are reconstructable for PIE proper, but the membership of this category increases steadily as we move down the tree. The implications are clear: this was an incipient innovation of PIE proper which became fully productive in NIE.

More or less the same pattern holds for the simple thematic present stems—a fact which Jay Jasanoff and I adverted to independently about three years ago. Again the data speak for themselves.

Anatolian: no simple thematic verbs

Tocharian: thirty-odd simple thematic presents, several of which reflect old presents in *-ské/ó-; of the remainder, only three have unarguable stem cognates elsewhere:

Toch. B	Old Irish	Latin	core languages
<i>āsām</i> '(s)he leads'	<i>·aig</i>	<i>agit</i>	Gk. ἄγει, Skt. <i>ájati</i> , etc.
<i>parām</i> '(s)he carries'	<i>·beir</i>	<i>fert</i> ³	Gk. φέρει, Skt. <i>bhárati</i> , etc.
<i>śaim</i> '(s)he lives'	—	<i>vīvit</i>	Skt. <i>jīvati</i> , etc. ⁴

TA *prosantrā* 'they are ashamed' is approximately cognate with Skt. *plóṣati* 'burns', OE *frēoseþ* 'freezes', etc., but the root-ablaut does not match

—note also the TB subj. *wišā(ṃ)* '(s)he will avoid', cognate or parallel to Gk. pres. εἴκει 'yields' < *wéyk-e- (with typical analogical depalatalization of the root-initial consonant in TB); but the other subjunctives of this class (except the two noted above) are or can be root-presents thematized within the history of Tocharian⁵

Italo-Celtic: many more examples, especially in Latin (the oldest well-attested language of the group); note the following (I omit stems that show clear signs of secondary thematization):

Latin	Old Irish	core languages
<i>sequitur</i> 'follows'	<i>sechithir</i>	Gk. ἕπεται, Skt. <i>sácate</i> , etc.
<i>angit</i> 'throttles'	—	Gk. ἄγχει
<i>coquit</i> 'cooks'	—	Skt. <i>pácati</i> , etc.
<i>fīdit</i> 'trusts'	—	Gk. πείθεται
<i>legit</i> 'gathers'	—	Gk. λέγει
<i>mergit</i> 'dives, sinks'	—	Skt. <i>májjati</i>
<i>pluit</i> 'rains'	—	Gk. πλεῖ 'sails', Skt. <i>práivate</i> 'flows', etc.
<i>serpit</i> 'crawls'	—	Gk. ἔρπει ('goes'), Skt. <i>sárpati</i>
<i>tegit</i> 'covers'	—	Gk. στέγει
<i>tingit</i> 'moistens'	—	Gk. τέγγει
<i>tremit</i> 'trembles'	—	Gk. τρέμει
<i>ūrit</i> 'burns'	—	Gk. εὔει ('singes'), Skt. <i>óṣati</i>
<i>vehit</i> 'conveys'	—	Skt. <i>váhati</i> , etc.
—	<i>fo·geir</i> 'warms'	Gk. θέρεται
—	<i>·feid</i> 'brings'	Lith. <i>vėda</i> , OCS <i>vedetŭ</i> 'leads'

The cognates cited in the right-hand column show that the situation in the core languages is similar. Once again we seem to be confronting an incipient innovation of PIE proper that became very productive in NIE.

A final piece of this picture is provided by the optative of thematic stems, a well-known crux of IE linguistics. The pattern of optative suffixes in general can be outlined as follows.

Anatolian: no category 'optative'

Tocharian: TA opt. -i- for all types of stems, also ipf. -i- for most; TB opt. and ipf.

-oy- for a-stems (< *-a- + *-i-), -i- for most others; note also the relics ipf. TB *sey* = TA *še-š* ‘was’ < PT **še-i* ← **še* < **syē* < PIE opt. **h₁s-iéh₁d*, and likewise ipf. TB *yey* = TA *ye-š* ‘was going’, ultimately reflecting PIE opt. **h₁i-yéh₁d*

—since the productive suffix is PT *-i- < *-ī- < PIE *-ih₁-, and not PT *-ē-, which could reflect *-oy- (and would appear in TA as -e-), ONLY THE ATHEMATIC SUFFIX is reflected in Tocharian (cf. Ringe 1996:80-6)

Celtic: the only clearly surviving suffix is OIr. subj. -a- (on which see immediately below)

Italic: athematic -ī- (in Lat. *velī-*, pf. subj. -er-ī-, etc.) ~ -iē- (at least in OLat. *siē-*) < PIE *-ih₁- ~ *-iéh₁-, but thematic -ā- (Trubetzkoy 1926), which is unanalyzable and is matched only by OIr. -a- (see above)

the core: athematic *-iéh₁- ~ *-ih₁-; thematic *-oy- < *-oyh₁- by regular sound change (see Beekes 1969:238-40 with refs.) < *-o- + *-ih₁-

So far as I can determine, Tocharian uses the inherited ATHEMATIC suffix with all types of stems; it REPLACES the thematic vowel of thematic stems. (Its function has expanded to include the imperfect by the same sort of development that Benveniste demonstrated for Middle Iranian in his famous article of 1951.) In the rest of the family we find two different formations. The core languages form the thematic optative in the obvious way: to the o-grade of the thematic vowel they add the zero grade of the optative suffix—in precisely the same way that an active 3rd person plural or participle is formed. Italo-Celtic (IC), however, has appropriated a suffix *-ā- of very unclear origin, which replaces the thematic vowel. The relation between IC *-ā- and ‘core’ *-oy- has long been a puzzle of IE linguistics, but in the context developed here it seems somewhat less puzzling than formerly: evidently the development of a thematic optative in PIE proper lagged somewhat behind the development of a class of simple thematic presents, so that even within NIE the core languages and IC have innovated differently.

At this point we should ask the obvious question: where do all the simple thematic stems of IE proper come from? It isn’t likely that they were all lost in Anatolian; at least some ought to be innovations of PIE proper, and the pattern of attestation suggests that they all are, if we have the right tree, since it looks like their number steadily increased as PIE proper underwent its first ‘speciations’ into daughter languages. Speculating about the origin of the subjunctive seems hopeless, because we are dealing with the origin of a meaningful category, not merely of its morphological means of expression; let’s lay it aside for now. The origin of the thematic aorist was worked out by George Cardona: in almost every case we can show that a thematic aorist arose by thematization of an athematic root-aorist (no doubt beginning in the active 3pl. and participle), and the same explanation can be extended to cover the few remaining examples. Can we account for the thematic presents in the same fashion?

It is certainly true that numerous thematic presents attested in the individual branches can be demonstrated to reflect athematic root-presents of PIH, or PIE, or

various later protolanguages; often enough the old athematic present actually survives in one or more languages. There are dozens of examples; one thinks at once of Gk. λείχει 'licks' \equiv Skt. *rédhi* < PIE **léygh-ti*, Gk. τρέπει 'turns (it)' \equiv Hitt. *tēripzi* 'plows' < PIE **trép-ti*, and so on. This process can easily have begun in PIE proper before it began to diversify, and that could account for some of the simple thematic presents solidly reconstructable for PIE and NIE. But it cannot be the whole story, for several reasons. In the first place, note that those thematic presents of the daughter languages which clearly reflect old athematic presents are recognizable partly by the fact that apparently cognate stems often show different ablaut grades of the root; in fact, that is the only evidence for secondary thematization in a number of instances. For example, nowhere in the family do we find an athematic root-present to **deyk-* 'point out', yet it is difficult to account for the difference in ablaut between Sanskrit *diśāti* and Latin *dīcit* ('says') unless those two stems are independent thematizations of an ablauting root-present with 3sg. **déyk-ti*, 3pl. **dīk-énti*. But among the solidly reconstructable simple thematic presents we find no such ablaut differences; except for the anomalous present of 'live' (see fn. 4), they all exhibit full-grade roots. Secondly, it is easy to imagine remodelling an athematic stem into a thematic stem if there is already a class of thematic stems into which to incorporate the new creation, but creating a thematic inflection ex nihilo by thematizing root-presents is a much tougher proposition. So we need to ask: can the few classes of derived thematic presents that are reconstructable for PIH have provided a suitable model for the thematization of athematic root-presents? And as usual the answer isn't clear.

So far I've been arguing inferentially; but in fact there are clear indications in the facts themselves that something else is going on, as Jay Jasanoff pointed out some twenty years ago. Specifically, it does appear that a few unaffixed hi-conjugation verbs of Hittite are cognate with simple thematic presents in PIE proper; the following examples seem reasonably secure (cf. Jasanoff 1979:83-7).

- **b^hódh_{h2}-* ~ **b^hédh_{h2}-* 'dig' > Hitt. *paddai*, OCS *bodetŭ* ('stab'), Lith. *bėda*; cf. also Lat. *fodit* 'digs, stabs', with *-ye/o- (but Ennius' *fodentēs* is doubtful (Skutsch 1985:678), whereas OLat. *fodī-* is well attested)
 - **kónk-* ~ **kénk-* 'hang' > Hitt. *gānki*, Goth. *hāhis* 'you suspend (judgment)', Skt. *śárikate* 'hesitates' (but does the -k- of Skt. *śárikate* suggest athematic inflection until the Proto-Indo-Iranian period (Jasanoff 1979:85)?)
 - **mólh₂-* ~ **mélh₂-* 'grind' > Hitt. *mallai* (with e-grade root, Melchert 1994:79), OIr. *meil*, Lat. *molit*, Goth. *malip*, Lith. *māla*; cf. also OCS *meljetŭ*, with *-ye/o-
 - **nóyH-* ~ **néyH-* 'turn' > Hitt. *nāi*, Skt. *náyati* 'leads'
 - **spónd-* ~ **spénd-* 'pour a libation' > Hitt. *ispānti*, Gk. σπένδει (but Lat. *spondet* 'promises' need not have anything to do with the original root-ablaut; it can easily be what it appears to be, i.e. an intensive **spondéyeti*)
- Nor is it difficult to find other examples that are at least plausible, for example:
- **pót(h₂)-* ~ **pét(h₂)-* 'fly' > Hitt. *pittai*, Skt. *pátati*, Gk. πέτεται, Lat. *petit* 'seeks'

—but it would be reassuring to find the o-grade in SOME underived category (Gk. iterative ποτᾶται isn't probative, like Lat. *spondet* cited above) *spórh₁- ~ *spérh₁- 'kick over' > Hitt. *ispāri*, 3pl. *isparranzi*, 2pl. iptv. *isperten* (Melchert 1994:80-1); also Skt. *sphurāti*?? —but the zero-grade root of Skt. is difficult to account for under this hypothesis; and since a nasal-in-fixed present is well attested in NIE (Lat. *spernit*, OE inf. *spurnan*, etc.), it seems as likely that the Skt. present somehow reflects thematization of a root-aorist

This is actually the largest group of stem-cognates involving hi-conjugation verbs, including most of the best examples. Other probable stem-cognition classes for hi-verbs are the following.

reduplicated hi-verb = CoreIE reduplicated thematic present (Jasanoff, p.c. 1996): *mi-mn- 'wait' in Hitt. *mimmai* 'refuses', Luvian *mimmandu* 'let them regard' (cf. Melchert 1993 s.v., 1994:81), Gk. μίμνει

hi-verb = NIE present in *-ye/o-: *h₂érh₃- 'break up' in Hitt. *harrai* 'crushes' (cf. Melchert 1994:79), NIE *h₂éryeti 'plows' (with regular loss of the laryngeal) in MidIr. *airid*, Goth. ptc. asg. m. *arjandan*, Lith. *āria*, OCS *orjetŭ*; reflex of the laryngeal restored analogically in Lat. *arat*, Gk. ἀροῖ

hi-verbs = Tocharian athematic subjunctives: *ay- 'give' in Hitt. *pāi* 'gives', PT *ay(šə) > TB *ai-m*, TA *eš* 'will give'

*ór- ~ *r- 'arrive' (cf. Melchert 1994:81) in Hitt. *āri*, *aranzi*, PT *ēr- (reflecting both ablaut grades, cf. Ringe 1996:67-9, 99-100) in TB *erāntrā* 'they are induced (to do good)'? —but the Toch. verb might reflect *h₃er- 'rise' (or is that also *or-? cf. Hitt. *arāi* 'rises'; *arta* 'stands' < *értor, Melchert 1994: 137—same root?)

*hi-verb (?) = Toch. root-present: *nós- ~ *nés- 'be safe', reconstructable from *nós- in PT *nēsə(šə) > TB *nesä-m*, TA *naš* 'is', CoreIE *nés-e/o- in Hom. Gk. νεῖται 'returns home', Goth. *ganisip* 'is saved'—only THERE IS NO ANATOLIAN COGNATE (hi-verb or otherwise)!

*hi-verb = CoreIE root-perfect: *wóyde 'knows' is the only example, and it has no Anatolian cognates, though the TYPE is very common in Hittite

*reduplicated hi-verb = PIE 'normal' perfect: plenty of NIE exx. (*memóne 'remembers', *tetólh₂e 'is holding up', *stetóh₂e 'is standing', etc.), and the type must be reconstructed for PIE (proper) to account for the Toch. reduplicated preterite; but in Hitt. only *mēmai* 'speaks' (NOT cognate with *memóne), *wewakta* 'demanded' (with a non-hi-conj. ending; PIH root *wek-, but no perfect attested early in any language)⁶

As can be seen, for some of these classes there are no actual stem-cognations at all—only the morphology of the classes suggests a connection between the Hittite stem class and that of PIE proper—and for the remainder there are only one or two respectable stem cognations each, so far as I can now see. To put it as bluntly as possible: though the INFLECTION of the hi-conjugation PRETERITE of Hittite is best matched by the inflection of the PIE perfect, the lexical class of hi-verbs is best

matched by the simple thematic presents of IE proper.⁷

By this point it is clear that verb inflection has undergone massive remodeling in one or both branches of the Indo-Hittite family. More exactly, the pattern of attestation of thematic stems in PIE proper demonstrates extensive remodelling in that half of the family; what is unknown, and may largely be unrecoverable, is the extent to which Anatolian has innovated too.

Most of these individual observations are not new, of course; what is new is the whole picture into which they can now be assembled, using our best computationally derived tree to guide our hypotheses. I am personally surprised and delighted at the way the distribution of forms fits the tree—so it is appropriate to close with a strong cautionary warning.

Let us return to a consideration of the tree itself. As our team has learned by experience, neat branching evolutionary trees are not always what they seem to be in linguistics; in particular, an apparently clean tree can conceal less orderly developments of two types. On the one hand there is always the possibility that the initial diversification of a family was network-like, not tree-like, with neighboring dialects sharing innovations in overlapping patterns according to the famous ‘wave model’, but that so many of the original dialects died out that the survivors, now separated from one another rather widely in linguistic terms, appear to have ‘speciated’ by clean splits. For the first-order subgrouping of our family there is no way to tell whether that is what happened; all we know is that our method gave us a remarkably clean cladistic tree (and it need not have done so, as we have emphasized elsewhere). But there is another type of development that our tree might conceal, namely parallel development of the sort termed ‘drift’ by Edward Sapir, in which related languages appear to develop in the same ways even after they have lost contact with one another. The case of the thematized aorists, whose development belongs largely to the history of the individual daughters, shows that we do have to deal with that phenomenon in IE. There is additional, and much more spectacular, evidence that points in the same direction; we ought to examine it briefly so as to form some idea of the scope of the problem.

The most widely accepted reconstruction of the PIE verb system accepts that a verb could have from one to three basic stems, which marked aspect; the system can be outlined and exemplified as follows.

STEM	FUNCTION
present	imperfective aspect (some statives included)
aorist	perfective aspect
perfect	stative

pres. *stí-steh₂-ti ‘is (in the process of) standing up’, aor. *stéh₂-t ‘stood up’, perf. *ste-stóh₂-e ‘is in a standing position’

pres. *déyċ-ti ‘is pointing out’, aor. *děyċ-s-t ‘pointed out’

aor. *h₂nék-t ‘reached’, perf. *h₂e-h₂nónċ-e ‘is at’

pres. *h₁éy-ti ‘is going’ (no other stems)

aor. *h₁lud^hé-d ‘arrived’ (no other stems)

perf. *wóyd-e ‘knows’ (no other stems)

Such a system is clearly reconstructable not only for the core, but also for NIE, since Latin preserves substantial relics of a purely aspectual use of the perfect stem (the s-formations of Old Latin, the use of *velle* in the *Senatus Consultum de Bacchanalibus* and in legal Latin generally, *nē* + perf. subjunctive in prohibitions, the double sequence of tenses following the ‘perfect’). Even the Tocharian system can be explained as a development of this traditional construct: it is abundantly clear that the Tocharian preterite reflects the morphological merger of the inherited aorist and perfect, and it seems increasingly likely that the subjunctive stem (with its appendage, the imperative) partly reflects old modal forms and partly old presents, including hi-conjugation presents. But the Anatolian system is obviously very different. Each Anatolian verbal lexeme has a single stem, which can correspond in formation to any of the types of stems attested in IE proper; all relations between stems are derivational, not inflectional. It would seem that we have a fundamental split between the two halves of the family, and that either Anatolian has lost the rich inherited inflectional system (the hypothesis of Cowgill and Rix), or else the aspect-based system was an innovation of PIE proper before it had begun to diversify.

However, this neat picture falls apart when we look more closely at the facts of Greek. It is Greek that seems to preserve the inherited aspect system best of all the attested languages; yet it is also in Greek that we find the clearest cases of interchange between present and aorist stems—especially presents that reflect inherited aorist subjunctives, but also an entire class of aorists that reflects an inherited present class. The most striking examples are the following.

Present stems that can only reflect inherited aorist subjunctives:

λείπει ‘leaves (it)’, replacing inherited *li-né-k^w-ti (Skt. *rinákti*; Lat. *linquit*, thematized); source is aor. subj. *léyk^w-e-ti, cf. indic. *léyk^w-t, 3pl. *lik^w-énd (Lat. *liquit*; Gk. ἔλιπε, thematized)

φεύγει ‘runs away (from)’, replacing inherited *b^hug-yé-ti (Lat. *fugit*, 3pl. *fugiunt*); source is aor. subj. *b^héwg-e-ti, cf. indic. *b^héwg-d, 3pl. *b^hug-énd (Lat. *fūgit*; Gk. ἐφυγε, thematized)

δέρκεται ‘sees, looks’; source is aor. subj. *dérk-e-ti, cf. indic. 3pl. *dṛk-énd (Skt. *ádṛśran*; Gk. ἔδρακον, thematized; apparently no pres. in PIE)

φείδεται ‘squares’ ← *‘marks off a share for him/herself’ ← *‘splits for him/herself’, replacing inherited (act.) *b^hi-né-d-ti (*[b^hinétsti]) ‘splits’ (Skt. *bhinátti*; Lat. *findit*, thematized); source is aor. subj. *b^héyd-e-ti, cf. indic. *b^héyd-d (*[b^héyd^d]); Skt. *ábhet*)

Zero-grade thematic aorists made to inherited thematic presents on the model of the preceding type:

Hom. ἐπι-σπεῖν ‘to wield’, made to pres. ἐφ-έπει ‘wields’, thematized from PIE *sépiti (Gathic Avestan *haptī* ‘serves, holds’)

ἐτράπετο ‘turned’, made to pres. τρέπει ‘turns (it)’, thematized from PIE *trépti (see above)

ἔπτετο ‘flew’, made to pres. πέτεται ‘flies’ (?; see above)

ἔσπετο 'followed' (inf. σπέσθαι), made to pres. ἔπεται 'is accompanying' (see above)

ἐπίθετο 'was persuaded', made to pres. πείθεται 'obeys' (see above)

ἔσχε 'got', made to pres. ἔχει 'has' (cf. Skt. *sáhate* 'prevails')

ἄπ-έπαρδε 'farted', made to pres. πέρδεται 'is farting' (cf. Skt. *párdate*)

Homeric and Classical Gk. passive aorists in -η-, -θη- ← INTRANSITIVE aor. in -η- with zero-grade roots, e.g. (Hom.):

ἐμίγη 'got mixed (up), had sex (with)', cf. trans. μείξαι 'to mix'

ἐπάγη 'it stiffened', cf. trans. πήξαι 'to fix (something in something else)'

The only possible PIH etymon for this last type is the STATIVE PRESENT suffix *-éh₁-: also intransitive, also non-ablauting, also with zero-grade roots (see especially Watkins 1971, Jasanoff 1988:16-9, 24-9).

It is difficult to imagine how such interchanges could have occurred in a system based so solidly on aspect, yet it is clear that they did occur. Note further that, though the development of aorist subjunctives into present indicatives is also attested in Germanic (as Karl Hoffmann pointed out more than forty years ago), the two cases are not similar at all. Not only has Germanic abandoned any system of aspect and lost the aorist indicative in any function, it has also merged ALL subjunctives functionally with the present indicative; that is why the so-called first person plural imperative in Germanic is identical with the corresponding indicative form, and it is at least one reason why the present indicative can be used to express future time. Under those conditions it is not at all surprising that some aorist subjunctives might surface as present indicatives. But in Greek the system of moods is just as much alive as the system of aspect; indeed, both still survive in Modern Greek. So we need a completely different explanation for these Greek puzzles.

So far as I can see, there is only one way to account for the Greek facts: these interchanges between presents and aorists must have occurred while the relation between present and aorist stems was much looser—specifically, at a time when presents and aorists were NOT part of the same fixed paradigm. In other words, they must have occurred when the organization of the system was more like it is in attested Hittite. And the actual examples tell us something further. Take another look at the first example listed on the preceding page. Latin, which is outside the core, and Sanskrit, which is inside, agree in showing a nasal-infixed present for 'leave'; that is therefore the form that the innovative Greek present must have replaced. (As is well known, the 'double-nasal' presents of Greek—the type λαμβάνειν 'take'—are completely unconnected with the nasal-infixed presents of the other languages; Greek eliminated the inherited type at some point in its prehistory.) And if our tree is the true tree, the replacement of a nasal-infixed present by an aorist subjunctive must have occurred at the earliest during the separate development of Greco-Armenian (see fig. 2).⁸ It follows that the organization of the verb resembled that of Hittite at least up to the point at which the protolanguage of the core began to diversify; and it follows further that the aspect system which is so solidly entrenched in Greco-Armenian and so easily reconstructable for Latin and

the satem languages must have become paradigmatic independently at least three times: once in the immediate ancestor of Italo-Celtic, once in that of Greco-Armenian, and once in that of the Germanic-satem complex.⁹

So there has been a great deal of parallel development in the organization of the verb system within NIE; clearly it would NOT be correct to continue reconstructing the 'Brugmann' verb (or the Cowgill-Rix verb) even for the protolanguage of the core. Strictly speaking this could have been seen a century or more ago, because the Greek facts have been known from the start. What throws those facts into relief, and adds a further argument that we should reconsider, is the new tree—and I think that is the most important consequence of our new proposal for the subgrouping of Indo-European.

Notes

¹ The distribution of thematized aorists was an input item for our tree-construction program, because it is already well understood; thus it is not a 'consequence' of our hypothesis, but part of the data on which the hypothesis is built. The other distributions discussed in this paper ARE genuine consequences of the hypothesis. (We did include the thematic optative in our database, but we originally evaluated it differently; the analysis reported here was arrived at only after we had the tree.)

² The etymological sources of the Tocharian subjunctive are too varied and problematic to be discussed here; note, for example, that many do not end in the thematic vowel and so cannot be etymologically identical with any subjunctive in any of the more familiar languages.

³ The forms of this Latin stem with no stem vowel are almost certainly syncopated rather than originally athematic; note that the subjunctive is *ferā-* (never '*ferī-*'), that the Umbrian future is (3sg.) *ferest*, etc.

⁴ As Jay Jasanoff reminds me, this stem is structurally anomalous; apparently it was created by inflecting the derived adjective **g^wih₃-wó-s* 'alive' (Lat. *vīvos*, Skt. *jīvās*, etc.) as a verb. There are no good parallels.

⁵ This class of Tocharian subjunctives will be discussed fully in a paper in progress.

⁶ Note that the apparent parallel between Hitt. *wāki* 'bites' < **wóh₂g-e-i* and Gk. *ἔαγε* 'it's broken' < **we-wāg-* ← **we-wóh₂g-* (cf. Kimball 1988:243, 245) is an illusion, as the wide difference in meaning demonstrates.

⁷ Other possible stem cognations are less exact. For example, we find **spóh₁i-* ~ **sph₁i-* in Hitt. *ispāi* 'eats his/her fill', 3pl. *ispiyanzi*; but while CoreIE **spéh₁yeti* 'gets fat' (Skt. *sphāyate*, OCS *spějetŭ* 'succeeds', etc.) has the same root-extension, its root shows the one ablaut grade that does not appear in the Hitt. paradigm. Does it appear in OE *spōwan* 'to succeed'? If so, has an intervocalic **-j-* been lost, as per Þórhallsdóttir's recent Cornell dissertation? In that case, is the Hittite zero grade an innovation, so that we should reconstruct PIH **spóh₁i-* ~ **spéh₁i-*? And this is the BEST of the doubtful cases. — As is well known, a possible further piece of evidence for a connection between the hi-conjugation and PIE (proper) thematic stems is the fact that in the latter the 1sg. active lary ending is not **-o-mi*, as expected, but **-o-h₂*. Of course the identity of the laryngeal is only a matter of (reasonable) inference, but there clearly WAS some syllable-final laryngeal; otherwise we would not find, e.g., Lith. *degù* 'I burn (it)' < **degúo* < **degō* < **dēgō* (where *`* marks the position of the accent, and *ˊ* marks acute intonation) < **d^hég^whoh₂*. The ending is reconstructable for PIE (proper) because Tocharian B *-u* is an almost certain reflex (Ringe 1996:89-90 with references). But why do we not find the lary ending **-h₂e-i* (or **-h₂-i*, if that's what it would be in this context)? To that extent the ending is like that of the PIE (proper) perfect, and not like that of the Hitt. hi-conjugation.

⁸ The Armenian nasal-SUFFIXED present *lk^hanê* has obviously been formed to the aorist *elik^h* and therefore tells us nothing useful about the inherited stem.

⁹ Even that is perhaps not the full story. Melchert (forthcoming) makes a strong case for the hypothesis that aspect PARADIGMS existed also in Proto-Anatolian. Since in my view the Greek facts make the reconstruction of such paradigms for PIH impossible, I must reckon with a fourth example of the same parallel development if Melchert is correct.

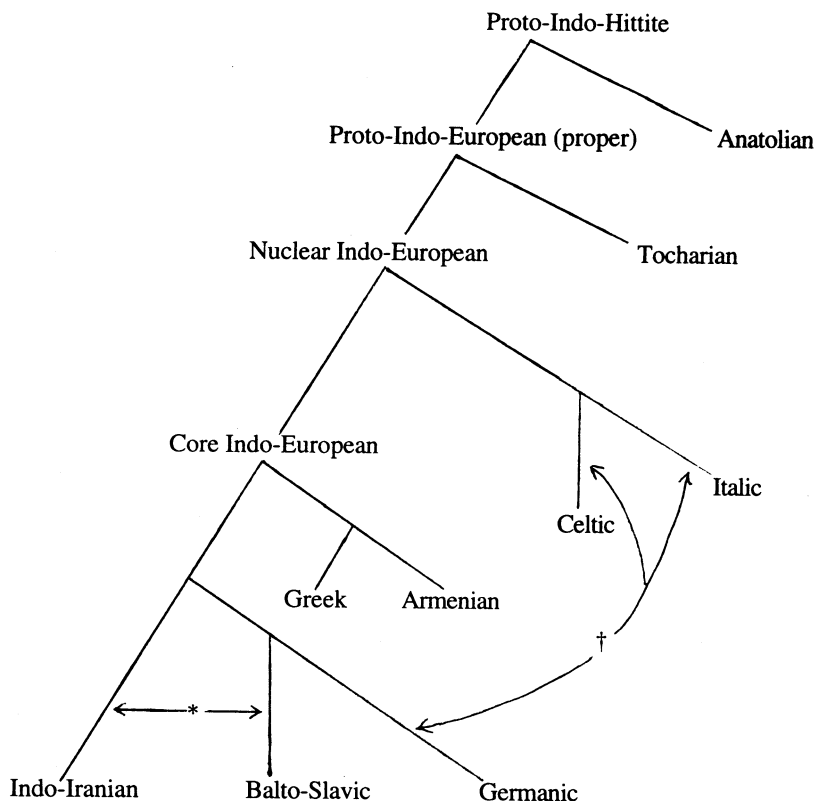


Fig. 1. The current best tree of Warnow, Taylor, and Ringe.

* Intense contact between divergent dialects, resulting in the borrowing of the satem sound changes (and probably lexical material).

† Less intense contact, probably between already different languages, leading to much lexical borrowing *before* diagnostic sound changes in any of these branches.

Note that Albanian cannot be placed precisely. It is clearly a member of IE proper, and clearly not a member of any of the smaller well-defined subgroups (Italo-Celtic, Greco-Armenian, or the Germanic-satem complex), but that is all that can be said.

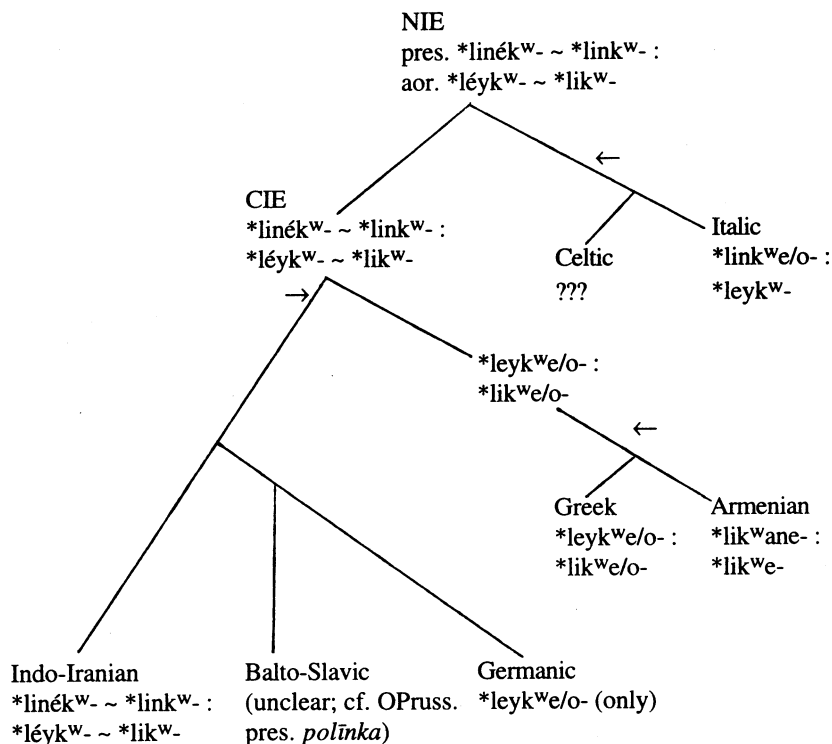


Fig. 2. The development of the present and aorist of *leyk^w- 'leave'.

The arrows mark the earliest points at which the relation between the stems can have become strictly paradigmatic in the prehistories of the attested languages.

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