

## Article

### *Beyond glottalic PIE and toward deep Nostratic*

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*Abstract:* The system of features embedded in the sound correspondences of traditional PIE is well-known to be disturbingly unusual, not to say typologically unacceptable, when compared with the evidence of real systems documented throughout the world. One hypothesis is to rearrange the apparent features: voiceless, voiced and voiced aspirate, as standing for an underlying system with respectively: voiceless, glottalized, voiced features. This is known as the Glottalic Theory of PIE. Another oddity of traditional PIE is the gaps in the attested root structures. Not all combinations seem to be possible. Some of them are close to nonexistent. The article proposes to integrate the sound correspondences and permissible root constraints into a model of (deep) Pre-PIE with only two series: voiceless and glottalic. Voice can be shown to have been only allophonic in Pre-PIE.

*Keywords:* Proto-Indo-European, Nostratic, Glottalic theory, Root structure.

#### 1. Introduction

Before I start discussing the current approach(es) of PIE and propose a radical model for Pre-PIE, it is necessary to focus on the issue of methods in historical linguistics and on the interaction between the methods and the way PIE has been investigated during the last two centuries. As described in Bomhard (2008:10), the method involves a sequence of at least four steps: data gathering, data sorting, analysis of potential cognates, reconstruction:

The basic principles underlying the Comparative Method may be summarized as follows: The first step involves the arduous task of data gathering, placing special attention on gathering the oldest data available. Once a large amount of lexical material has been gathered, it must be carefully analyzed to try to separate what is ancient from what is an innovation and from what is a borrowing. After the native lexical elements have been reasonably identified in each phylum, the material can be compared across phyla to determine potential cognates. Once a sufficient body of potential cognates have been identified, one can begin to work out the sound correspondences. Not only must the regular sound correspondences (that is, those that occur consistently and systematically) be defined, exceptions must also be explained. Here, widely-attested sound changes (palatalization, metathesis, syncope, assimilation, dissimilation, etc.) provide the key to understanding the origin of most exceptions. In other cases, the analysis of the influence that morphology has exerted provides an understanding of how particular exceptions came into being. Some exceptions, though clearly related, simply defy explanation. All of these must be noted. The final step involves the reconstruction of ancestral forms and the formulation of the sound laws leading to the forms in the descendant languages, identifying the laws that have produced the regular sound correspondences as well as the exceptions. The same principles apply to the reconstruction of grammatical forms and rules of combinability and to the identification of the historical transformations leading to the systems found in the daughter languages. (Bomhard 2008:10)

It should be emphasized that the word “reconstruction” is somewhat misleading and naive. In fact “reconstruction” amounts to a conscious *construction* of a satisfactory hypothesis by linguists rather than an automatic process of “reconstruction” with no human intervention, as noted in Campbell-Mixco (2007:164):

The success of any given reconstruction depends on the material at hand to work with and the ability of the comparative linguist to figure out what happened in the history of the languages being compared.

The operations involved in a process of reconstruction unravel between two extreme poles: one is a strictly *generative* approach which hypothesizes an initial state, called ancestor language, and sound laws that are rewritings of the initial state; another one is a *transsynchronic* pole which hypothesizes a sequence of synchronic stages with systemic changes and rearrangements between each synchronic stage. The typical tool of the generative approach is the comparative method while the transsynchronic approach resorts more extensively to internal reconstruction. A strictly generative approach would have to hypothesize an implausibly complex initial state and a absurd number of sound laws to account for the data. For that matter, marginal or exceptional phenomena are removed for the initial state and dealt with otherwise: Cf. above “widely-attested sound changes (palatalization, metathesis, syncope, assimilation, dissimilation, etc.)”. On the other hand a purely transsynchronic approach without proper calibration by typology or external and independent sources of knowledge about real languages is at risk of inventing conlangs.

## 2. *Assessing traditional PIE*

In practice the historiography of PIE studies shows that the successive versions of the PIE reconstructions have been neither strictly generative nor strictly transsynchronic. It can be noted that on the whole there is a slow-motion trend from the generative to the transsynchronic pole, but the majority of PIE scholars probably favor as straightforward a PIE reconstruction as possible and balk at proposals that upset the balance too far away from the generative pole. One of the problems entailed by a strict obedience to the comparative method is the aporia that PIE is always posited as the *Initial State* and there is no possibility to reconstruct a linguistic stage older than PIE. Without a minimal shift toward the transsynchronic pole the process of reconstructing Pre-PIE or even deeper stages is deadlocked. Another structural *flaw* of the comparative method is that the Initial State is bound to display an apparent complexity significantly higher than the languages compared because the daughter languages have followed divergent paths rather than parallel paths. For that matter it is no wonder that PIE, be it in its traditional or glottalic versions, seems to be more complex than most of the daughter languages. Traditional Indo-Europeanists do not seem to be really aware of that flaw. The raw output generated by the comparative method must be constantly rearranged in order to produce *simple* synchronic stages. The comparative method structurally entails a spiraling into exponential complexity of the apparent Initial State. This exponential increase of complexity must be planed out by the discovery of phonological processes that account for the divergent developments in the daughter languages. The complex system proposed for Nostratic in Bomhard (2008:101) is in my opinion a methodological illusion. Even if all the comparisons were to be accepted, a point that remains to be determined, there is no doubt that a complete overhaul of the system and of the sound changes is necessary in order to hypothesize a *simple* Initial State for Nostratic together with a set of adequate systemic changes and developments. The multiplication of entities might be criticized using the Occam's razor but this situation is caused by the comparative method itself: a correspondence is not a proto-phoneme but the trace of a proto-phoneme or maybe even of several proto-phonemes.

As emphasized before, “reconstruction” amounts to a conscious *construction* of a satisfactory hypothesis rather than an automatic process with no human intervention. It can also be noted that the preliminary steps of data sorting and analysis of potential cognates are no less conscious and painstaking. There is no such thing as an obvious cognate or an obvious regular sound correspondence. One of the difficulties of Nostratic studies is precisely that there is no ready-made Nostratic phonological proto-system available on the shelf. Indo-Europeanists never had to look for a proto-system and sound correspondences. Sanskrit, which acted for some time as the implicit Initial State, provided a providential ready-to-compare framework to Indo-Europeanists who seem to be completely unaware how lucky they have been and how undeservedly harsh they are in their criticism of Nostraticist attempts at finding the keys they never had to look for. Indo-Europeanists have in fact been as lucky as cursed with the ready-made Sanskrit system because they have not been able to move

away from the illusion that Sanskrit was more or less the Initial State. Roughly summarized, the historiography of the successive versions of PIE phonological reconstruction can be divided in four periods:

- ready-to-compare Sanskrit-sounding four-way system: *voiceless* ~ *voiced* ~ *voiced aspirate* ~ *voiceless aspirate*, without laryngeals,
- ready-to-compare Sanskrit-sounding three-way system: *voiceless* ~ *voiced* ~ *voiced aspirate*, without laryngeals,
- ready-to-compare Sanskrit-sounding three-way system: *voiceless* ~ *voiced* ~ *voiced aspirate* ~ *voiceless aspirate*, with laryngeals,
- glottalic reinterpretation: *voiceless* ~ *voiced* (=glottalic) ~ *simple voiced* (=aspirate) with laryngeals,

Period 1 to Period 2 happened when the *voiceless aspirate* feature was seen as a late dialectal innovation of a limited subset of languages. By so doing Indo-Europeanists moved one step away from a strictly generative approach. Period 2 to Period 3 happened when it appeared that many features of the Indo-European languages could be parsimoniously explained by and integrated within a phonological and morphological framework that was not attested in any of the languages. It took the incomplete and somewhat contradictory evidence of the Anatolian languages and more than half a century until the laryngeal framework got accepted as the mainstream reference. It is quite amusing that this paradigmatic change is extolled as a major success of historical linguistics by the “comparatists” when it is in fact a major breakaway from the generative pole toward the transsynchronic pole. Period 3 to Period 4 happened when it was realized that the three-way features inherited from the ready-to-compare Sanskrit system had a major typological flaw. Once the voiceless aspirates are removed from the initial state the traditional three-way system does not make sense any more.

In other words most sound correspondences embedded in the Indo-European languages can be described with three apparent series. Now, we need to examine what they mean from the point of view of the actual reconstruction of the earliest retrievable stage(s). The three series of correspondences can be analyzed from several angles:

1. as regards typology: it is striking that the features *voiceless* ~ *voiced* ~ *voiced aspirate* do not add up to a possible system, as first noted long ago by Jakobson. One of the proposed solutions to this problem is the Glottalic Theory: the features are reinterpreted respectively as *voiceless* ~ *glottalized* ~ *voiced*. Aspiration is a secondary development in this approach. This theory is not only typologically acceptable but it also accounts to some extent for the rarity of \*b<sup>1</sup>.
2. as regards *markedness*: voiceless correspondences are much more frequent than all the others. They account for half the total, which is much more than a third, if there were an “equal” share between the three series. This suggests that the voiceless phonemes were voiceless “from the start”<sup>2</sup>. They are unmarked hence most frequent.
3. as regards *fortis* ~ *lenis*: a conspicuous feature is that the *voiceless* series is not only the most *frequent* but also the most *stable* in most Indo-European daughter languages. This suggests that the voiceless series is fortis and the other series were lenis. This situation is in fact a problem for the Glottalic Theory, because one would expect the glottalized series to be fortis, and hence more stable than the voiceless series.

<sup>1</sup> It can nevertheless be noted that glottalized labial stops are not infrequent. In all cases they are possible. This argument is therefore considered inconclusive by the disbelievers of the Glottalic Theory.

<sup>2</sup> That is to say: as far back as we can go into the depth of PIE's ancestors.

4. as regards root structure: another oddity in the reconstruction of PIE roots is that there are plenty of homophonous roots and at the same time several possible combinations are not used at all. And this requires a separate analysis.

### 3. The phonetic constraints on PIE roots

The three series that account for the comparanda do not freely combine to build Proto-Indo-European roots. The actual possibilities are represented in the following table:

	voiced	voiceless	aspirate
voiced		dek	degh
voiceless	teg	tek	
voiced aspirate	dheg		dhegh

Table1. Apparent possible combinations in the traditional system

Some possibilities are not (or hardly ever) attested: \*\*deg, \*\*tegh, \*\*dhek. For example, the attested combinations in Ancient Greek were:

	voiced	voiceless	aspirate
voiced	(deg)	dek	dekh
voiceless	teg	tek	tekh
voiced aspirate	theg		

Table2. Attested combinations in Ancient Greek

Words with a *deg* structure are rare and often reduplicated in Greek (b\_b or d\_d). There is no consistent explanation so far for this lacunary distribution with one third of unattested potential combinations which were available to the speakers but do not seem to have ever been used. It can be noted that the Glottalic Theory does not shed any real light on the reasons of this lacunary distribution as seen in the following table:

	glottalized	voiceless	voiced
glottalized		ṭek	ṭeg
voiceless	teḱ	tek	
voiced	deḱ		deg

Table3. Apparently possible combinations in the Glottalic Theory

The promoters of the Glottalic Theory tend to portray it as a natural explanation of the gaps in the distribution. This is for example the point of view in Bomhard (2008:55-56):

For the first time, the root structure constraint laws can be credibly explained. These constraints turn out to be a simple voicing agreement rule with the corollary that two glottalics cannot cooccur in a root. Hopper (1973:160) cites Hausa, Yucatec Mayan, and Quechua as examples of natural languages exhibiting a similar constraint against the cooccurrence of two glottalics. Akkadian may be added to this list as well if we take Geers' Law to be a manifestation of such a constraint.

The “explanation” is supposed to be that all features can freely combine except when one of them is glottalized. There is in addition typological support for this “explanation” in real languages. In my opinion it remains to be proved that this is really an “explanation” rather than a clever rewording

of the constraints bolstered by a careful selection of a handful of natural languages. Other attempts at rewording the constraints exist. For example: each root should possess one and only one glottal feature, such as voice or glottalization. This clever and a priori plausible rewording does not work as *tek* has no glottal mark while *deg* has two. The “explanation” proposed by the Glottalic Theory is conspicuous for being a double-tier rewording: features can freely combine *unless* one of them is glottalized. I tend to consider it probable that a double-tier rewording combined with any of the words: lenis, fortis, unmarked, marked, least, most, glottalized, voiceless or voiced could explain most if not all given configurations. The “explanation” promoted by the Glottalic Theory would be more credible if it were worded as a one-tier unambiguous statement such as: each root should possess one and only one glottal feature, such as voice or glottalization. Unfortunately such a one-tier unambiguous statement with some theoretical backing does not seem to be possible in the case of PIE root constraints. In addition it can be noted that the possibility *\*\*dek* does not exist while more marked possibilities like *\*deḱ* and *\*deg* exist, which is extremely strange.

In other words, the Glottalic Theory does not help understand the pattern of Proto-Indo-European roots and the problem of having a lacunary distribution with one third of gaps and plenty of homophonous roots at the same time remains unexplained.

#### 4. A more radical approach than Glottalic PIE

This calls for an even more radical reform than the Glottalic Theory and raises the following issue: the three apparent series may amount to only two real and underlying series, which split into the three apparent series as reflected in traditional PIE at a later stage. Instead of three series generating nine combinations of which only six are attested, the issue is to determine only two series generating only four combinations. Such a reform requires to understand which of the possible roots or series can be paired together as potential variants. This also means that some phonemes of Pre-PIE are reflected by more than one correspondence of the traditional reconstruction.

It can be noted that in the current dictionaries, and in Pokorny in particular, such variants are not rare: Compare Latin *digit* < *\*deig* with Germanic *\*taihwo* < *\*deik*. If *\*g* and *\*k* are really *phonemes* at the PIE stage or earlier, this cannot be the same “root”. From a sheer methodological point of view such “variants” are unacceptable. They implicitly point at the fact that the phonological contrast between *\*g* and *\*k* did *not* exist in (Pre-)PIE and that the existence of a contrast between *\*g* and *\*k* in the daughter languages is an innovation, which probably was already in the making in PIE itself but was recently acquired at that time. The existence of minimal pairs shows that the contrast must have existed in PIE but the variants also indicate that the underlying older system did not have that contrast. There are plenty of “variants” and “by-forms” in PIE reconstructions. The logical conclusion is that *voice*, in the sense of the traditional reconstruction, was not *phonemic* in Pre-PIE. Examples of *\*g* alternating with *\*gh* are not infrequent either. Purists of the comparative method would object that these variants should be posited as independent but this is the typical flaw of a rigid and orthodox resort to the comparative method: positing a complex initial state in order to generate a whole array of variants. The huge number of variants shows that the initial state, representative of Pre-PIE, was simple. It could be added that there probably exist even more variants in IE languages which have been considered isolated words. In fact the situation as regards variants is probably worse than what is reflected in the “official” references dealing with PIE reconstructions. For example Celtic languages have numerous variant words with voiced or voiceless phonemes.

Therefore the phonemic contrast was between two series: *voiceless-voiced* ~ *voiced aspirate* or in the Glottalic theory between: *voiceless-glottalized* ~ *voiced*. It can be noted from the Nostratic point of view that the absence of a contrast between voiceless and voiced phonemes in Proto-Semitic has been observed that some authors:

The distinction between voiced and unvoiced sounds, for instance, might not be an original feature of Proto-Semitic. (Lipiński 2001:110)

On that basis the apparent three series of the traditional reconstruction can be reorganized as follows:

	voiced	voiceless	aspirate
voiced			
voiceless		tek = teg = dek	degh
voiced aspirate		dheg	dhegh

Table4. Equivalent combinations in the traditional system

Considering the fact that the three series of Proto-Semitic amount to only two: *voiceless-voiced* ~ *emphatic* the ultimate conclusion is that the so-called voiced aspirate series originates in a previously emphatic or glottalized series, hence the following situation:

	voiceless	glottalized
voiceless	tek (trad. tek = teg)	teḵ (trad. degh)
glottalized	ṭek (trad. dheg)	ṭeḵ (trad. dhegh)

Table5. Underlying structure of possible combinations

Another conclusion is that Afrasian emphatics should correspond with PIE so-called voiced aspirate series rather than with the (trad.) voiced series, as the Glottalic theory proposes.

#### 5. The case of roots with resonants as second consonant

According to the traditional reconstruction, there are gaps in the distribution of stops in the roots but no such gaps are supposed to exist when the second consonant is a resonant like \*r, \*l, \*n or \*m. A full distribution is supposed to exist:

	labial	dental	velar
voiced	** (beR)	deR	geR
voiceless	peR	teR	keR
aspirate	bheR	dheR	gheR

Table6. Theoretical distribution of stops and resonants

In order to reduce this apparently existing full distribution to only four items, one has to determine whether some of them are not variants of each other. It is not difficult to find numerous examples of such pairs of roots: the underlying contrast between voiced \*geR and voiceless \*keR is nonexistent. For example:

- Pokorny 357 \*gel = 544 \*kel 'hill', but no \*ghel with that meaning. Compare OE *clud* 'hill, rock' and *hyll* 'hill' < Gc. \*klud and \*hulni.
- Pokorny 369 \*ḡemə 'to marry' = 612 \*kom 'with', but no \*ghem with that meaning.
- Pokorny 369 \*ḡem-bh 'tooth' = 902 \*kem 'bit, mouthful', but no \*ghem with that meaning.
- Pokorny 380 \*ḡenu 'knee' = 566 \*kenk 'heel, bend of the knee', but no \*ghen with that meaning. Compare English *knee* and *hela* 'heel' < Gc. \*kniw and \*hanhila.
- Pokorny 370 \*gen = 558 \*ken 'to compress into a ball', but no \*ghen with that meaning.
- Pokorny 373 \*ḡenə 'to give birth, beget' = 563 \*ken 'young, new', but no \*ghen with that meaning.
- Pokorny 383 \*ger = 567 \*ker 'to cry hoarsely (bird)', but no \*gher with that meaning. Compare OE *crawe* 'crow' and *hraefn* 'raven' < Gc. \*krēw and \*hraban.

- Pokorny 382 \*ger = 938 \*(s)kerp ‘to gather’, but no \*gher with that meaning.
- Pokorny 392 \*gerebh = 945 \*(s)kerb(h) ‘to scratch, scrape’, but no \*gherb(h) with that meaning.
- Pokorny 385 \*ger = 948 \*(s)ker(bh) ‘curved’, but no \*gher with that meaning.

Not far from half the roots \*geR can be paired with roots \*keR of similar if not identical meanings but this never happens with roots \*gheR. This bears ample testimony to the basic fact that voiced and voiceless velar phonemes do not contrast in these roots of \*CeR shape. They are in fact free allophones of the same root whereas \*gheR does contrast with \*geR / \*keR. A similar situation can be found for dentals, for example:

- Pokorny 206 \*der = 1071 \*ter ‘to strike, flay’, but no \*dher with that meaning.
- Pokorny 203 \*der = 1075 \*ter ‘to go (beyond)’, but no \*dher with that meaning.
- Pokorny 203 \*der = 1070 \*ter ‘to tremble’, but no \*dher with that meaning.

The opposition between voiced and voiceless phonemes in these roots is bogus and needs a complete and thorough reassessment. The underlying situation is:

	labial	dental	velar
voiced	/	/	/
voiceless	peR	teR = deR	keR = geR
glottalized	bheR	dheR	gheR

Table7. Underlying system with stops and resonants

Even though I consider it necessary to reconstruct PIE roots and items with a three-way system when applying the comparative method, this does not mean that we should posit a three-way system as the real synchronic phonology of Pre-PIE. Pre-PIE had only a two-way contrast and it is interesting to keep the three-way system for theoretical and practical reasons, especially in order to understand how the two-way system develop into a three-way or even four-way system in the different branches.

It can be noted that in my proposal the *glottalized* series is not the traditional *voiced* series, which I consider did not exist in early Pre-PIE, but the so-called *voiced aspirate*. This means that there must be very serious problems in current Nostratic comparanda. Most of the items must be wrong if my theory is correct. Logically voice should be allophonic in Nostratic as well if Nostratic is the same entity as Deep Pre-PIE. And I tend to think that Deep Pre-PIE must have a strong connection with Nostratic. Only the items made up with voiceless and resonant phonemes have a significant potential of being correct. The other items involving supposedly voiced and glottalized phonemes (in the sense of the Glottalic Theory) are doubtless impossible as the voiced and glottalized phonemes of putative relatives of PIE are being paired respectively with an erroneous series and a nonexistent one.

#### 6. The different developments between (pre-)PIE and the IE languages

The radical reform with two series can now be tested against the evidence of IE languages. And the issue is to understand how the initial state with two series can have developed into the attested systems with a higher complexity.

##### Stage 1 Deep Pre-PIE or Deep Nostratic

The system had only roots of the following shape: *tek* ~ *tek* ~ *tek̥* ~ *tek̥*. There is no constraint: all phonemes can freely combine.

Stage 2 (Pre-)PIE

Because voice plays no phonemic role, voiceless consonants *-k-* had intervocalic free voiced allophones. This is the situation that can be hypothesized in the ancestor of PIE. The original situation evolved according to three different paths in the daughter languages.

	voiceless	glottalized
glottalized	ṭek (free variant teg)	ṭeḵ
voiceless	tek (free variant teg)	teḵ

Table 8. Possible combinations in Pre-PIE

Stage 3 Type I Daughter-languages with the four-way system

The glottalized feature became breathy voiced. This frost voiceless / voiced variant roots into apparently separate roots. Possibly because of the zero grade *\*tgh*, *tegh* became *degh* through voice assimilation. In addition the sequence *t-H* became a phoneme.

	voiceless	glottalized
glottalized 1	**ṭek (rare)	ṭeḵ > dhegh
glottalized 2	ṭek > dheg	
voiceless 1	tek	teḵ > tegh > deg
voiceless 2	teg	
Laryngeal	t_H > th	

Table9. Daughter languages type I

In those languages, the fortis hierarchy is *voiced* < *voiceless* < *aspirated*. The Type I languages, except Germanic, are all satem. Armenian and Germanic are evolved systems out of type I with an additional mutation of the system.

Stage 3 Type II daughter-languages with a three-way system

The glottalized feature becomes breathy. It can be noted that the Grassman Law in Greek is to some extent an illusion. Breathly dissimilation applied only to *theḵh* (< *\*ṭeḵ*) because *teḵh* (< *\*teḵ*) never had two aspirates. In Italic the change to breathy happened after *teḵ* was changed to *deḵ*.

	voiceless	glottalized
glottalized 1	**ṭek (rare)	ṭeḵ > theḵh > teḵh (Greek) ṭeḵ > theḵh (Latin)
glottalized 2	ṭek > theg	
voiceless 1	tek	teḵ > teḵ > teḵh (Greek) teḵ > deḵ > deḵh (Latin)
voiceless 2	teg	
Laryngeal	t_H > th	

Table10. Daughter languages type II

The fortis hierarchy of that group is *voiced* < *breathy/fricative* < *voiceless*.



Stage 3 Type III Daughter-languages with a two-way system

Languages where *teḵ* becomes *deg* require another explanation: in these languages, glottalized never became breathy but the glottalized feature appear to spread on the preceding consonant, and later on glottalized became voiced. This spread is possibly caused by the phonotaxis of the zero grade and assimilation. This feature is actually in favor of preglottalized phonemes in that subset of languages: \*teʔk > (zero-grade) \*tʔk = ʔtk (\*t assimilates to the following pre-glottalized \*k) hence a new full grade \*ʔteʔk.

	voiceless	glottalized
glottalized 1	**teḵ (rare)	teḵ > deg
glottalized 2	teḵ > deg	
voiceless 1	tek	teḵ > teḵ > deg
voiceless 2	teg	
Laryngeal	t_H > t	

Table 9. Daughter languages type III

In the theory I propose Celtic and Italic followed completely different paths and there can be no Italo-Celtic common stage. Celtic is closest to Balto-Slavic and Albanese.

Stage 4 Type IV Armenian

This is an evolved system out of type I.

Stage 5 Type V Germanic

This is an evolved system out of type I.

	voiceless	glottalized
glottalized 1	teḵ > dek > teH	teḵ > dhegh > deg
glottalized 2	**teḡ (rare)	
voiceless 1	tek > TeH	teḵ > teḡ > dhegh > deg
voiceless 2	teg > Tek	
Laryngeal	t_H > th	

Table 10. Daughter languages type V

This scenario means that Germanic evolved out of a stage close to Indo-Iranian but did not become satem.

I have not tried to ascribe Tocharian to a particular type as the system of early Proto-Tocharian probably needs much work before it is fully understood. A plausible hypothesis is to propose a two-way Type III evolving to (or being misrepresented graphically as) a one-way system. I tend to think that early Tocharian loanwords into Chinese may provide a better understanding of the contrasts existing in early Proto-Tocharian.

7. Comparison with the traditional theory

For the sake of clarity the theory I propose for Deep Pre-PIE can be compared with the traditional “reconstruction” in the following tables.

Std		dheg	tek, teg	degh	dhegh	
New		ṭek	tek	teḵ	ṭeḵ	t-H
	stage 1	deg	tek, teg	degh	degh	th
	stage 2	deg	tek, teg	degh	d(h)egh	th
I.IR	stage 3	deg	tek, teg	degh	d(h)egh	th
Germanic	stage 4	teH	TeH, Tek	teg	deg	t

Type I (Indo-Iranian, Armenian, Germanic)

The Grassman Law in Sanskrit is close to an illusion caused by an erroneous Initial State.

Std		dheg	tek, teg	degh	dhegh	
New		ṭek	tek	teḵ	ṭeḵ	t-H
Italic	stage 1	ṭeg	tek, teg	deḵ	ṭeḵ	t-H
	stage 2	theg	tek, teg	dekh	thekh	t

Type II (Italic)

Std		dheg	tek, teg	degh	dhegh	
New		ṭek	tek	teḵ	ṭeḵ	t-H
Greek	stage 1	theg	tek, teg	tekh	thekh	t-H
	stage 2	theg	tek, teg	dekh	> thekh	th

Type II (Greek)

Std		dheh	tek, teg	degh	dheg(h)	
New		ṭek	tek	teḵ	ṭeḵ	t-H
Western	stage 1	ṭeg	tek, teg	> ṭeḵ	ṭeḵ	t
	stage 2	deg	tek, teg	deg	deg	t

Type III (Celtic, Albanese, Balto-Slavic)

### 8. The case of Anatolian IE

Anatolian languages display a (partial) retention of the so-called laryngeals and it is probable that in this branch neither glottalized nor voiceless developed into breathy or aspirate phonemes. The writing system is somewhat obscure and defective. The contrast between voiced and voiceless can be documented intervocalically. The writing system does not document the contrast word-initially or finally. There is no indication that Anatolian languages still had any kind of emphatic or glottalized phonemes. The cuneiform sign *Qa* appears in words transcribed with -g- in Ugaritic. The only issue is to know if there is any synchronic trace of initial voice in Anatolian languages. It can be noted that this table is also relevant for Hurrian, which Bomhard and I have determined to be a close relative of PIE. Cf. Fournet-Bomhard 2010.

The probable situation can be depicted in the following table (Cf. Hoffner-Melchert 2008):

Std	dheg	tek, teg	degh	dhegh	
New	ṭek	tek	ṭek	teḱ	t-H
Anatolian	teg	tek, teg	teg	teg	t-ḥ

Type III (Anatolian)

9. *The internal structure of the IE family*

According to the different scenarios and types, the internal structure of the family is:

	=> Type III		Anatolian IE
(Pre-)PIE	=> Type III	centum satem	=> Celtic => Balto-Slavic, Albanese
	=> Type II	centum centum	=> Italic => Greek
	=> Type I	satem evolved satem evolved centum	=> Indo-Iranian => Armenian (type IV) => Germanic (type V)
	=> unclear type (II ?)		=> Tocharian

10. *Conclusion*

In the reanalysis I propose for Deep Pre-PIE the initial state has therefore very little to do with the initial state proposed in the framework of traditional PIE or glottalic PIE. The apparent complexity of PIE and the impression of a simplification or fusion of series are artefacts generated by a rigid and inadequate application of the comparative method. This rigid application may provide an illusion of rigor. The raw output of the comparative method must be constantly rearranged in order to produce *simple* synchronic stages. The comparative method structurally entails a natural spiraling into exponential complexity of the apparent Initial State. This exponential increase of complexity must be planed out by the discovery of phonological processes that account for divergent developments in the daughter languages. The voiceless aspirates did not exist in PIE: most result from C-H contacts; the contrast between velars and palatals did not exist in PIE: the split results from vocalic contamination or transfer of features; the three-way contrast was still in the making in PIE: voice used to be allophonic of the two phonemic features: voiceless and glottalized. All the features and complexity supposedly existing in the traditional version of PIE are illusions and artefacts created by an inadequate application of the comparative method and an insufficient understanding of the processes involved in reconstruction. There is little doubt that Indo-European languages have been constantly evolving toward more complexity.

A consequence of the radical system I propose for Deep Pre-PIE is also that this system with a contrast between glottalized and voiceless phonemes should logically be the reference system for macro-comparative works on Nostratic.

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