

## PROTO-INDO-EUROPEAN TONES?

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1. Classical Indo-Europeanists assumed the existence of a distinction between acute and circumflex long vowels in the proto-language on the basis of evidence from Indo-Iranian, Greek, Balto-Slavic, and Germanic (e.g., Hirt 1929). It will be argued that the attested differences arose in the separate branches after the dissolution of the proto-language.

1.1. The Indo-Iranian evidence for a circumflex tone is based on the disyllabic reading of certain long vowels in Vedic and Gathic, e.g. Vedic *bhās-*, *bhāās-* 'light', *préṣṭha-*, *práyīṣṭha-* 'dearest', acc.sg. *pánthām*, *pánthaam* 'path', Gathic acc.sg. *páθaam* 'path', *mazdaam* 'God', gen.pl. *-aam*, subj. *-aa-*. The disyllabic reading is regular in Gathic and sporadic in Vedic. It can be shown that in Gathic it occurs whenever we expect an intervocalic laryngeal (cf. Monna 1978: 97-103). It follows that intervocalically the laryngeals yielded a glottal stop in Indo-Iranian and that this glottal stop was preserved as a hiatus in the separate languages. This eliminates the evidence for tonal distinctions in Indo-Iranian and, consequently, the Indo-Iranian evidence for a Proto-Indo-European circumflex.

1.2.. The Greek evidence for tonal distinctions is limited to the word-final syllable, where a long vowel or diphthong may be either rising = acute or falling = circumflex (cf. Risch 1975: 472). The same distinction on unstressed final diphthongs is reflected as the converse tonal distinction on a long vowel or diphthong in the preceding syllable. Since tonal distinctions on unstressed syllables are exceptional in a language with free stress, this suggests that the Greek tones are due to a secondary development.

If we eliminate the cases where the circumflex is the result of recent contractions or analogical patterning (cf. Bally 1945: 42), we find that endings are circumflex whenever they were disyllabic at an earlier stage whereas original long vowels are acute. The following instances are of particular interest:

1) Acute ending in nom.pl. *oĩkoi* < *-oy* 'houses' versus circumflex ending in loc.sg. *oĩkoi* < *-o-i* 'at home', cf. the dat.sg. ending of the consonant stems *-i*.

2) Circumflex 3rd sg. present ending in *keleúei* < *-e-i* 'orders', where *-i* was taken from the athematic flexion as a tense marker and added to the original thematic present ending *-e*.

3) Circumflex 3rd sg. optative ending in *keleúoi* < *-o-ĩ*, where the optative marker must be analogical because the original laryngeal was not vocalized. The distinction between acute and circumflex was lost in non-final syllables, cf. 1st pl. *keleúoimen*, 2nd pl. *dúnaisthe* 'be able', *ónaisthe* 'have profit'. The generalization of the root vowel before *-ĩ* yielded the accentuation of 1st pl. *didoimen* 'give', *histaimen* 'set up', *titheimen* 'put', 2nd pl. *histaisthe* 'stand', where the place of the stress points to *-oi-*, *-ai-*, *-ei-*.

I conclude that Greek offers no evidence for an inherited distinction between acute and circumflex tones. The attested distinction arose after the loss of the PIE. laryngeals. (1)

1.3. The tonal distinctions of Baltic and Slavic are extremely important for the reconstruction of Proto-Indo-European. They do not, however, represent a tonal distinction of the proto-language. As I have argued in detail elsewhere (1985a), the acute tone of Baltic and Slavic resulted from the phonetic merger of the PIE laryngeals with the glottalic feature of the unaspirated voiced stops into a glottal stop. It has been preserved unchanged in originally pretonic syllables in Latvian, e.g. *pēds* 'footstep', *nuōgs* 'naked', Vedic *padám*, *nagnás*, and under the stress in the Žemaitian dialects of Lithuanian. The original circumflex of Baltic and Slavic was simply the absence of a glottal stop. It is found in the following categories:

1) Long vowels from contractions, e.g. Lith. gen.sg. *algōs* 'salary', Gr. *alphēs*.

2) Lengthened grade vowels in the nom.sg. form of stems in a resonant, e.g. Lith. *akmuō* 'stone', *duktē* 'daughter', Latvian *ābuōls* 'apple', Serbo-Croat *žērāv* 'crane', Czech *žerāv*.

3) Sigmatic aorist, e.g. SCr. 1st sg. *dōnījeh* next to *donēsoh* 'brought', *ūmriījeh* 'died', *zaklēh* 'swore'.

4) Long vowel preterit, e.g. Lith. *žėmė* 'took', *bėrė* 'strewed', *lėkė* 'flew'. The acute of *gėrė* 'drank' reflects the root-final

(1) Thus, I assume the following relative chronology:

1) Loss of the PIE. laryngeals, e.g. *anēr* 'man' < *\*H<sub>2</sub>nēr*, *\*mēns* 'month' < *\*meH<sub>1</sub>ns*. The new long vowels merged with the original lengthened grade vowels. Intervocally, a lost laryngeal left a hiatus, e.g. *\*po'imēn* 'shepherd'.

2) Analogical developments, e.g. *keleuei* < *\*-e'i*, *keleúoi* < *\*-o'ĩ*.

3) Loss of hiatus in non-final syllables.

4) Loss of hiatus and rise of the circumflex in final syllables.

laryngeal, not the lengthened grade root vowel.

5) Lith. 3rd person future forms, e.g. *duõs* 'will give', *kalbẽs* 'will speak'. Since the long vowel is not shortened in polysyllabic stems, the metatony must be older than Leskien's law. Assuming that the PIE. laryngeals were lost after lengthened grade vowels, I connect the metatony in this category with the lengthened grade in the 2nd and 3rd sg. active forms of the Vedic sigmatic aorist injunctive (cf. 1985b).

6) The tonal alternation between SCr. 1st sg. *dàh* and 3rd sg. *dâ* 'gave' is the same as between Lith. *dũosiu* and *duõs* 'will give'. I think that it reflects the loss of the laryngeal after a lengthened grade vowel in the aorist injunctive.

7) Lengthened grade vowels in original root nouns, e.g. Lith. *gèlà* 'pain', *žolė* 'grass', *mèsà* 'meat', SCr. *rjèc* 'word', *çar* 'magic', *sâm* 'alone'.

8) Latvian nom. sg. *sàls* 'salt' and *guovs* 'cow', cf. Latin *sàl*, Vedic *gâus*. Here again, I assume that the laryngeal was lost after a lengthened grade vowel. The expected acute reflex of the laryngeal is found in Lith. *sólymas* 'brine'.

9) Lith. nom.sg. *-ė*. In my view, this ending originated from the loss of the laryngeal after a lengthened grade vowel in the nom.sg. form of the root noun which is represented in *arklìdė* 'stable', *avìdė* 'sheepfold', *alùdė* 'pub', *pelùdė* 'chaff store', also *žvaigždė* 'star', Vedic *-dhā*, Latin *-dēs*.

Thus, the Balto-Slavic circumflex is the normal reflex of any long vowel of non-laryngeal and non-glottalic origin. It provides no evidence for a Proto-Indo-European tonal distinction.

1.4. The Germanic evidence for tonal distinctions is limited to originally final syllables, where original long vowels and diphthongs have a short and a long reflex. In my view, the long reflex is regular before original word-final obstruents and analogical in the gen.pl. ending, while the short reflex is regular word-finally and before word-final nasals. The following categories are of major importance:

1) Gothic *undarō* 'under' < *\*-ōt*, cf. Vedic *adharāt* 'below', and other adverbs in *-ō*, e.g. Go. *þiubjō* 'secretly', *þapbrō* 'thence', *galeikō* 'similarly', OHG. *gilihho*, OE. *gelice*, as opposed to the word-final reflex of the same vowel in Go. *giba* 'gift', ON. *giǫf*, OE. *giefu*, etc.

2) Go. *hidrē* 'hither', OE. *hider*, cf. Latin *citro*. This category apparently adopted the original ablative ending. The instrumental in *\*-ē* was preserved in dat.sg. *daga* 'day', *imma* 'to him',

*hindaṇa* '(from) behind', OE. *hindan*.

3) Go. 3rd sg. weak preterit *nasida* 'saved' reflects the original final vowel \*-ē, not \*-ēt, and can be identified with the Lithuanian preterit in -ė, as I have argued elsewhere (1985c). The other languages adjusted the preterit endings of the weak verbs to those of the verb 'to do'.

4) The Go. gen.pl. endings -ō and -ē must be derived from Proto-Germanic \*-ōan and \*-eian, as I have argued in detail elsewhere (1978: 291-293).

5) The nom.sg. ending of the *n*-stems is phonetically regular in Go. *guma* 'man', OE. *tunge* 'tongue', *ēage* 'eye', OHG. *zunga*, *ouga*, and analogical in Go. *tuggō*, *augō*, ON. *tunga*, *auga*, OE. *guma*, OHG. *gomo* (ibidem). The ending of ON. *gumi* was taken from the *ion*-stems (cf. Lid 1952).

6) Since final \*-ai yielded -a in Go. *bairada* 'he is borne', *bairanda* 'they are borne', *faura* 'before', cf. Gr. *parai* 'beside', the preservation of the diphthong in the optative *bairai* 'he may bear' must be attributed to the original final \*-t. The pronominal nom.pl. ending of the adjective, e.g. *blindai* 'blind' was taken from the monosyllabic demonstrative pronoun *pai* at a recent stage. Long final diphthongs had been preserved in Proto-Germanic, e.g. Go. *ahtau* 'eight', dat.sg. *gibai* 'gift', *anstai* 'favour'.

I conclude that the Germanic material is fully explained in terms of segmental features and offers no evidence for an inherited tonal distinction.

2. Though the distinction between acute and circumflex long vowels cannot be attributed to Proto-Indo-European, it does not follow that the proto-language had no distinctive tone. There are several indications that point to the existence of a tonal distinction at a stage in the development of Proto-Indo-European. (2)

2.1. The Old Indic accentual system is tonal in the sense that the feature which distinguishes stressed from unstressed syllables is inherent in the syllabic nucleus and independent of contiguous syllables. As a consequence, we find such sequences as RV I 1.6 *tāvét tát satyám* on one hand and X 75.5 *imám me gaṅge yamune sarasvati sútudri* on the other. (3) The Indian

(2) On the morphological nature of the tone cf. the literature cited under 2.3 below.

(3) In principle, the number of high tones in a phrase may vary between one and the number of syllables, though it is never larger than the number of independent morphemes.

grammarians leave no doubt about the tonal character of the accent (cf. Allen 1953: 87-91). Like its Japanese counterpart, which is comparable from a typological point of view, the Vedic accentual system can be derived from a system with a two-way level tone distinction on each syllable (cf. McCawley 1978: 301). The attested system may have developed through the loss of high tones following a high tone in the same syntactic unit and subsequent grammaticalization of the resulting tone alternations.

2.2. The accentual system of Greek can be derived from that of Vedic, but not conversely. It is characterized by a number of innovations, among which are the following:

1) Limitation of the place of the stress to the last three syllables of the word, and to the last two syllables if the final syllable contains a long vowel or diphthong. This implies a shift of the stress from the antepenult to the penult before a long ultima.

2) Wheeler's law: retraction of the stress from a short ultima to a short penult after a long antepenult, e.g. *poikílos* 'spotted', *boukólos* 'cowherd'.

These stress shifts have in common that a long syllable attracts the stress not onto itself, but onto the intervening syllable. They are best explained by the assumption that unstressed long vowels or diphthongs received a rising or falling tone movement in the neighborhood of a high tone vowel, even if there was an intervening syllable, which in that case adopted the high tone of its environment. The assumption of a tonal assimilation which yielded (sub-phonemic) rising and falling tone movements on unstressed long vowels and diphthongs also provides a basis for understanding two more accentual developments in Attic:

3) Stressed long vowels and diphthongs in the penultimate syllable are falling before short and rising before long final syllables, e.g. gen.sg. *sōtēros* 'saviour', gen.pl. *sōtērōn*. This is understandable if the short ultima was low whereas the long ultima was falling.

4) Vendryes' law: a short antepenult receives the stress from a long penult before a short ultima, e.g. *égōge* 'I at least', cf. *egō* 'I'. The stressed vowel had become falling as a result of the previous development and lost the stress to a preceding short syllable, which had apparently become high as a result of tonal

assimilation, but not to a preceding long syllable, which had only become rising.

The tonal assimilation surmised for Greek was probably posterior to and perhaps evoked by the loss of the PIE laryngeals, which gave rise to a large number of new long vowels. It presupposes the earlier existence of a level tone system.

2.3. It has recently been argued that the accentuation of Baltic and Slavic derivatives can be explained on the basis of inherent accentual properties of the constituent morphemes (cf. Dybo 1968, 1973, Garde 1976). If the separate morphemes are assigned "high" or "low" tone according to their accentual properties, the Balto-Slavic place of the stress can be identified with the leftmost high tone of a word form. The stress patterns can therefore be explained if we assume that late Proto-Indo-European possessed a tonal distinction between "high" and "low" morphemes.

2.4. The reconstructed Indo-European proto-language has a remarkable root structure constraint: a PIE root may not contain a voiced aspirate and a voiceless stop simultaneously, as in *\*\*bheut-* or *\*\*teubh-*, unless it is preceded by *\*s-*, as in *\*steigh-* 'mount' (e.g., Meillet 1937: 174). If we assume progressive voice assimilation after initial *\*s-*, the distinction between voiceless stops and voiced aspirates was apparently a prosodic feature of the root as a whole. It can therefore be compared with the proposed tone distinction. If this is a meaningful comparison, we expect a correlation between voiceless stops and high tone on the one hand, and between voiced aspirates and low tone on the other.<sup>(4)</sup> This hypothesis is investigated in a forthcoming study by Alexander Lubotsky. The PIE obstruent harmony has a typological parallel in the Austronesian language Jabêm, where obstruent voicing is actually correlated with a level tone distinction (cf. Bradshaw 1979).

2.5. It has long been recognized that the traditional reconstruction of the PIE obstruent system is typologically deviant in view of the double marking of the voiced aspirates. It must be noted that both voicing and aspiration are often accompanied by a low tone on the following vowel. We must therefore consider the possibility that voicing, aspiration and low

(4) It follows that the incompatibility of voiceless stops and voiced aspirates in a PIE root is a corollary of the incompatibility of high and low tone on the same root. The actual state of affairs is complicated by the influence of the PIE laryngeals on the tonal patterns, as Lubotsky points out.

tone all originated from a single phonological feature, e.g. "lax". Though it is generally assumed that "consonant types affect tone but tone does not affect consonant types" (Hyman 1975: 229), this does not account for the rise of distinctive tone in syllables which do not contain obstruents. It is therefore probable that the proposed PIE tones were older than the distinction between voiceless stops and voiced aspirates. The latter distinction may have arisen at the same time as zero grade vocalism, which points to a period of strong dynamic stress. It is remarkable that distinctive tone was apparently not eliminated at that stage but survived into the attested languages. The theory advanced here now suggests an explanation for the alternation of voiceless stops and voiced aspirates in root enlargements, where the original distribution may have depended on the accentual properties of the root.

3. It will be clear that the indications of a PIE level tone system listed above require further investigation. The point I want to stress here is their compatibility and mutual reinforcement. Indeed, it seems difficult to account in a principled way for the peculiarities of the Vedic accentual system, the Greek accent shifts, the accentuation of Baltic and Slavic derivatives, the PIE root structure constraint, and the markedness of the voiced aspirates in relation to the voiceless stops without the assumption of a PIE level tone system. The proposed tonal distinction has nothing to do with the traditional difference between acute and circumflex, which arose in the separate languages after the dissolution of Proto-Indo-European.

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