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ON THE GREEK REFLEXES OF THE PROTO-INDO-EUROPEAN LABIOVELARS

ABSTRACT: The present article investigates the problem of the reflexes of the Proto-Indo-European labiovelars in Ancient Greek. There have been numerous discussions of the issue, both concerning the origin of such a set of changes and also about the precise formulation of its outcomes and possible analogical changes. The data is drawn from a variety of Greek dialects which reflect the different outcomes of the prehistoric labiovelars. It is discussed at length whether the hypothesis proposed in 1881 that the outcome of the voiced labiovelar */g^w/ in Greek was /d/ before the front vowels (both /i/ and /e/) is supported by the attested data. It is concluded that such a view would require too many analogical changes and, therefore, that it is better to assume different outcomes before /i/ and /e/ respectively. Furthermore, it is pointed out that the overall picture of the development of labiovelars in Greek requires a new and thorough investigation of the complete material presented in the particular dialects.

KEY WORDS: Indo-European linguistics, Ancient Greek, labiovelars

1. INTRODUCTION

The basic phonological developments of the Proto-Indo-European labiovelars in Greek have long been established in the history of Indo-European linguistics (cf. Brugmann 1913, Rix 1976: 85–88). Descriptively,

the outcome of this development seems generally clear – the labiovelars become labials, dentals or velars depending on the context and the quality of the labiovelar itself. It has been postulated that they continued to exist in Proto-Greek – this reconstruction is confirmed by the Mycenaean data, which preserves the labiovelars as a set of sounds denoted by a distinct set of signs, in which they are transliterated as <q->. However, the labiovelars have different reflexes in the different dialects of Greek and there is no consensus on what would have been the exact formulation of the phonological developments that led to these differences. Some scholars would like to postulate that the labiovelars change into labials before /i/ and dentals before /e/, rather than universally changing into dentals before front vowels (cf. the contrasting formulations in the standard handbooks by by Meier-Brügger 2003: 135 and by Fortson 2010: 253).

In this paper, I examine the development of the Proto-Indo-European labiovelars in Proto-Greek through Mycenaean and into Ancient Greek dialects. By the analysis of the attested material I will try to decide whether a sound law produced different reflexes in the contexts of /i/ and /e/ or whether differences in outcomes were merely the effect of analogy.

2. MYCENAEAN GREEK

What is clear about the development of the labiovelars is the approximate chronology of their change. There are three labiovelars reconstructed for Proto-Indo-European: */k^w/, */g^w/ and */g^{wh}/ which are preserved in Proto-Greek as */k^w/, */g^w/ and */k^{wh}/ . In Mycenaean, the earliest attestation of Greek, they are still most probably preserved as follows (cf. Bartoněk 2003: 138, 447):

a) /k^w/ written as <q->

<a-pi-qo-ro> /amphik^woloi/ (nom. pl.) ‘servants’ :: Attic *amphípolos*

<a-to-ro-qo> /anthrōk^wōi/ (dat. sg.) ‘man’ :: Attic *ant^rrōpōi*

<-qe> /k^we/ ‘and’ (encl.) :: Attic *te*

<e-qe-ta> /hek^wētās/ ‘follower’ :: *hepētās* (Pindar)

b) /g^w/ written as <q>

<qa-si-re-u> /g^wasileus/ ‘leader, king’ :: Attic *basileús*

<qo-u-ko-ro> /g^woukolos/ ‘cowherd’ :: Attic *boukólos*

- c) /k^{wh}/ written as <q>
 <to-ro-qa> /trok^{wh}ā/ ‘nutrition’ :: Attic *trép^hō* ‘feed’, *trop^hē*
 <-qo-ta> /k^{wh}ontās/ ‘killing’ :: Attic *-p^hontēs*

The basis for the assumption that those signs represent labiovelars in Mycenaean Greek is the fact that they are written with separate signs compared to the other occlusives.

It is clear that the labiovelar lost its labial element when adjacent to */u/, as already can be observed in Mycenaean <qo-u-ko-ro> /g^wou-kolos/ ‘cowherd’ from *g^wou-k^wolos (Attic *boukólos*), in contrast to Attic *ai-pólos* ‘goatherd’ from *ai(ǵ)-k^wolos (Fortson 2010: 70).

3. ANCIENT GREEK DIALECTS

What is not so clear is the development of the labiovelars in the Greek dialects after the Mycenaean period. The development of the labiovelars before /j/ is uncontroversial, as all of them lose their labial co-articulation and change into /ss/ and /zd/ respectively (cf. Rix 1976: 86). Consecutively *k^w becomes /t/ before front vowels, /p/ before non-front vowels (excluding /u/) and consonants, and /k/ when adjacent to /u/ in the non-Aeolic dialects as in, for example (Rix 1976: 86):

- *k^wis ‘who’ > Attic *tís*
 *k^wetw₃- > Attic *téttares*
 *k^wo-d^he ‘whence’ > Attic *póthēn*
 *k^wek^wlos ‘wheel’ > Attic *kúklos* (possibly through *k^wek^w > *k^wok^w)

The probable phonetic development here is [k^we] > [k^{wy}e] > [k^ye] > [k^se] > [t^se] > [te] (as postulated by Rix 1976: 87).

However, in the Arcado-Cyprian dialects the usual reflex of this labiovelar is a sort of a sibilant (cf. Buck 1955: 62) as in, for example, Cyprian *sis* :: Attic *tis*, Arcadian *śis* (written with a special sign) :: Attic *tis*. This is a peculiar feature of Arcado-Cyprian dialects and has been described in detail by Dubois 1986: 65–70 and Egetmeyer 2010: 205–213.

In the Aeolic dialects, the normal reflex before /e/ is a labial, for example (Buck 1955: 62):

Thessalian, Lesbian *pémpe-* :: Attic *pénte* ‘five’
 Boeotian *Belp^hoí* :: Attic *Delp^hoí*
 Boeotian *péttares* :: Thessalian *petro-* :: Attic *téttares*

In some cases, however, in contrast with the typical Aeolic labial reflex, there are also cases in which the outcome is a dental, for example, in Aeolic *te*, *tis* or *tíma*, which some scholars would like to explain as analogically reshaped forms (Meillet 1894) or dialectal borrowings (as Rix 1976: 87 tentatively suggests).

It is clear that analogical leveling took place within paradigms after the change of the labiovelars. Irregularities in verbal paradigms were created by the different outcomes of the labiovelars depending on the context:

1sg. **-k^wo-* > **po*
 2sg. **-k^we-* > **te*
 3sg. **-k^we-* > **te*
 1pl. **-k^wo-* > **po*
 2pl. **-k^we-* > **te*
 3pl. **-k^wo-* > **po*

After these irregularities are produced, the dental reflexes are usually leveled to the labials (3sg. and 3pl., as most salient forms, are used as a model for analogical modification), for example:

1sg. **sek^womai* ‘I follow’ > *hépomai*
 3sg. **sek^wetai* ‘he follows’ > **hétetai* >> *hépetai*
 3pl. **sek^wontai* ‘they follow’ > *hépontai*

The development of the voiced labiovelar **g^w* presents more difficulties, though in some contexts it develops as expected. Parallel to the development of **k^w*, **g^w* becomes /*g*/ when adjacent to /*u*/, and becomes /*b*/ before /*a*/, /*o*/ and consonants, as in, for example:

**h₁su-g^wih₃-s* (or **h₂yu-g^wih₃-s*, cf. Weiss 1994) > Attic *hugiés* ‘healthy’
 **g^wōus* > Attic *boũs* ‘cow’

Its reflex before /e/ is also fully predictable and gives /d/ as in, for example:

*g^welb^hus > Attic *delp^hús* ‘womb’

*sm̥-g^welb^hes-os > Homeric *adelp^heós* ‘brother’

*ŋg^wen > Attic *adén* ‘gland’

*g^weyH- > *deomai >> through analogy, Homeric *béomai* ‘I shall live’ (Homeric subjunctive used as future, /b/ restored analogically after the aorist *ebíōn* or an Aeolic form in Homer)

However, before /i/, the attested material has /b/ instead of /d/, as would be expected in parallel to the development of *k^w, for example:

*g^wih₃-os > *bíos* ‘life’ (contrary to expected *dios, so Meier-Brügger 2003: 135)

*g^wih₃-eto > *bíotos* ‘life’

*g^wih₃-eh₂ > *bía* ‘force’

*g^wiH-ós > *biós* ‘bow’

One of the examples of the ‘regular’ *g^we > /de/ development is attested in the Heracllean dialectal form *enediōkōta* (standard *embeiōkōta*, cf. Buck 1955: 61). Other examples are more dubious and listed by Lejeune 1972: 50 and Schwyzler 1939: 300–301: *Antídios*, *ídios*, *aídios*. The often cited Attic form *bibrōskō* ‘I devour’ (from the zero grade of the root *g^werh₃ → *g^wṛh₃) is not evidence for the change *g^w > /b/, because its reduplicated syllable is analogically remodeled on the root syllable, where /b/ is the regular outcome of *g^w before a consonant. We know that this change preceded the Attic change of ā > ē because we have the Attic aorist form *ébē* ‘he went’ from *e-g^weh₂-t.

A similar problem with the inconsistency of the development of labiovelars before front vowels arises with the reflexes of the Proto-Greek *k^{wh} from Proto-Indo-European *g^{wh} which becomes /t^h/ before /e/ but /p^h/ before /i/, /a/, /o/ and consonants and /k^h/ when adjacent to /u/:

*g^{wh}en-yo > Attic *t^heinō* ‘kill’

*h₃eg^{wh}is > Attic *óp^his* ‘snake’ (contrary to the expected *ot^his)

*h₁ŋg^{wh}us > Attic *elak^hús* ‘small’

4. THE PROBLEM AND POSSIBLE SOLUTIONS

As Buck has rightly observed: “there is no satisfactory explanation for this divergence from the development $q^w > t$ before i ” (Buck 1933: 129). Many scholars have tried to solve that problem and there have been many theories to explain the inconsistency.

The most obvious and logical solution would probably be to postulate that all the labiovelars change into dentals before the front vowels /e/ and /i/. The question is whether this explanation is consistent with the attested material. This hypothesis has in fact been postulated as early as in 1881, in an article by Schmidt, who proposed that Greek once had the forms *deiomai and *boios, corresponding to Sanskrit *jayati* and *gaya-*, and that the bilabial was generalized from these. The problem is that these Greek forms are not actually attested. Furthermore, they only account for *bíos* ‘life’, leaving both *biós* ‘bow’ and *óphis* ‘snake’ unexplained (cf. Stephens-Woodard 1986: 134). Schwyzer (1939: 300), on the other hand, mentioned that all the examples of /bi/ from *g^wi in Attic can be explained either analogically or as Aeolisms. This is problematic because no such Aeolic forms are attested and because it is based only on the fact that Aeolic usually has labial reflexes of the labiovelars. Therefore, unless we want to postulate complex and overwhelming analogical changes from unattested roots to advance the *ad hoc* assumption that all labiovelars before front vowels ought to become dentals, this hypothesis should be abandoned.

Another approach to this problem was championed by Meillet (1894) who sought to explain the dentals as the reflexes of labiovelars before /e/ and bilabials as the reflexes before /i/. Meillet believed that *k^wi regularly gives /pi/ in Greek as in such cases as *h₃ek^w-i > *ópis* or k^wetures > *písures* (a supposedly Aeolic form in Homeric Greek). According to him, *tis* and *ti* were generalized from the oblique cases (*teo* etc.). Meillet asserted that palatalization occurred because Greek /e/ was actually /^he/; this has chronological implications for the whole palatalization process – namely, it requires a series of changes in a critically short period of time and therefore strains the whole hypothesis (cf. Stephens-Woodard 1986: 137). Sheets (1975) put forward a similar approach, which also has certain weaknesses.

Yet another approach was envisioned by Pedersen (1933), and also later by Allen (1957), who claimed that there was an asymmetry in the phonological development of the labiovelars, namely that all labiovelars have dental reflexes before /e/, but only /k^w/ has a dental reflex before /i/. Pedersen suggested that all labiovelars were palatalized before front vowels but that before the loss of labialization, a “Rückverwandlung” took place before /i/ in the case of *g^w and *k^{wh}, but not *k^w (cf. Stephens-Woodard 1986: 134). The same authors rightly criticize Pedersen for postulating a replacement of “an asymmetrical palatalization process with a symmetrical one followed by an asymmetrical ‘Rückverwandlung’” (Stephens-Woodard 1986: 135). Allen (1957), on the other hand, tried to use a structural explanation to account for the discrepancy between the developments of the labiovelars. He claimed that “before a fully palatal vowel (i), palatalization of the preceding labiovelar would not be expected; the ‘half-palatal’ vowel /e/, on the other hand, would be sufficiently palatal to palatalize the preceding consonant, without qualifying phonologically as a carrier of palatality” (Allen 1957: 121). Thus, in his opinion, *k^w becomes a dental before /i/ as a result of structural pressure of a ‘drag-chain’; the hole in the system created by the change of /s/ > /h/ caused the assibilation /ti/ > /si/, and this causes the phonetically unexpected palatalization of *k^wi > /ti/. I find this hypothesis too dependent on the assumption that there is a strong pressure to preserve the structural integrity of a language’s phonological system (cf. also the criticism made by Stephens-Woodard 1986: 135).

A more recent approach to the problem has been proposed by Stephens and Woodard. They have reviewed the earlier hypotheses and approached the problem from a typological perspective. Having observed that palatalization can be triggered by not only the following vowel (a typical anticipatory assimilation), but also by the preceding vowel (the perseveratory assimilation, but not in Yakut as they state) and building on an idea proposed by Hamp (1960: 196), they managed to solve the problem of certain irregularities within the labiovelar development. In 1960, Hamp first came to the conclusion that the previously mentioned forms, such as *antídios*, *ídios*, *aídios*, if derived from the etymon of *bía* and *bíos*, respectively (Schwyzer 1939: 300), would have /d/ regularly because the original labiovelar is not only followed by /i/, but also preceded by it. This fact has now been confirmed typologically

by Stephens and Woodard and expanded to the formulation: *g^w > d / [V –back] _ i (Stephens-Woodard 1986: 146). This formulation would account for the aberrant Heracleean *endediōkóta* form, tracing it back to *eng^weg^wi- (the standard *embebiōkóta* found in Theophrast would then result from generalization of the bilabial), unless the analogical solution posited by Francis (1973) is adopted instead. The only problem here is that Stephens and Woodard extend the sound law postulated by Hamp based on only one example, which is inherently risky. Therefore, I am not sure if such a reformulation should be accepted or whether Francis' analogical solution is ultimately preferable. After all, Heracleean is known for such aberrant phonetics. Creating proposals based on only a single example will inevitably lead hypotheses that cannot be tested. Therefore, for example, Greek *óp^his* (the only example of *g^{wh}i > /p^hi/ instead of /t^hi/) could be analyzed as having been actually *ot^his, influenced by perseveratory assimilation of the preceding rounded vowel. Furthermore, Stephens and Woodard seek to explain the development of the labiovelars with a wave-model of the spread of the change through the dialects in the different regions of Greece. This would explain, in their opinion, the unexpected dental reflexes in Aeolic, treated by other scholars as borrowings from other dialects or as special clitic development of *k^we > *te* in Aeolic (this could also be explained by the irregular sound change due to frequency of occurrence, cf. Mańczak 1988). They believe that the “palatalization of the labiovelars in Greek was such a process of phonetically and chronologically gradual generalization.” They propose that “it was a wave, progressively attenuated in its spread from non-Aeolic into Aeolic dialects. The change commenced first in the typologically most conducive environment before high front vowels and only later extended into the environment before mid front vowels” (Stephens-Woodard 1986: 151). This would, in their opinion, account for the problems of inconsistency in the development of labiovelars and different reflexes in the Aeolic dialects. However, I would like to draw attention to the fact emphasized recently by Sowa (2011), that the many forms found in glosses are in fact literary or Homeric, and that it was more a literary phenomenon that made the Lesbian forms popular in Greek, which started a tendency among grammarians to classify every form different from Ionic-Attic as Aeolic (Sowa 2011, cf. also the comments by Szemerényi 1966 on the Aeolic reflexes of labiovelars).

There is a similar explanation for the so-called Aeolisms in Homer, although this problem is too complicated to be discussed in a short article. Traditionally, the Aeolisms were taken as archaic remnants of the earlier Aeolic phase of the Greek epic poetry, but the hypothesis which has recently been gaining support states that the “Ionic epic tradition existed side by side with an Aeolic epic tradition and the «Aeolisms» are a result of borrowing and diffusion” (so Nikolaev 2010: 230). Unquestionably, interrelationships between the Greek dialects exist; many dialects have forms which were probably borrowed from others. It is therefore impossible to speak of a uniform Greek language.

Fairly recently, two novel approaches to the explanation of the divergent development of labiovelars in Attic-Ionic have emerged (Parker 2013, van Beek 2020). In 2013, Holt Parker, building on the earlier hypothesis postulated by Stephens and Woodard (1986), claimed that the process of the palatalization of labiovelars proceeded not necessarily in a wave model (Stephens-Woodard 1986: 150-151) but in the form of “a set of ordered rules within the dialects” (Parker 2013: 214). According to those rules, first the voiceless labiovelars underwent palatalization (a fact which would also explain the development of $*k^{w_e}$ into *te* in Aeolic) and only then the rest of the labiovelars were palatalized, changing the labial coarticulation into a labio-palatal feature (Parker 2013: 222-223). Parker’s solution, however, does not satisfactorily explain the fact that $*g^{w_i}$ changed into **bi* and not into **di* as would be normally expected (he claims that the labio-palatal did not delabialize before /i/ because of phonetic reasons, cf. Parker 2013: 223). The problem was recently addressed by van Beek (2020), including a very extensive discussion of the Homeric forms. He proposed that the “palatalization before any front vowel in Ionic-Attic was inhibited by a preceding rounded back vowel /o/” (van Beek 2020: 73) and that the sequence $*g^{w_i}$ had different outcomes word-internally (*di*) and word-initially (*bi*) (van Beek 2020: 72). However, the exact explanation of this strange divergence remains to be found.

To sum up, it seems that the development of labiovelars in Attic-Ionic proceeded in several stages of which the deletion of the labial coarticulation in the vicinity of $*/u/$ ($*k^w *g^w *g^{wh} > k g k^h / _u, u_$) can be traced back at least to the Mycenaean period and beyond, if not to Proto-Indo-European itself (cf. Fortson 2010: 253).

In the second stage, the remaining labiovelars $*k^w$, $*g^w$ $*k^{wh}$ developed depending on their position in the word and the context:

- 1) before a consonant, /a/ or /o/ into labials:
> p b p^h / _a, o
- 2) before /e/ into dentals (unless preceded by /o/ which made $*g^w$ change into /b/):
> t d t^h / _e
- 3) before /i/ into the following phonemes:
> t b p^h / _i (unless preceded by /i/ which made $*g^w$ change into /d/)

However, it should be borne in mind that as long as there is no comparative grammar of all the Ancient Greek dialects that takes into account the probable literary and standard dialects, borrowings and diffusion, any hypotheses explaining the exact development of labiovelars will be deemed incomplete because of *ad hoc* assumptions about the expected forms of Aeolic or Ionic, which we find in grammars and glosses rather than in the directly attested epigraphic material, which needs further phonological interpretation of its orthography.

REFERENCES

- Allen W. S., 1957, 'Some Problems of Palatalization in Greek', *Lingua* 7, pp. 113–133, [https://doi.org/10.1016/0024-3841\(57\)90078-5](https://doi.org/10.1016/0024-3841(57)90078-5).
- Bartoněk A., 2003, *Handbuch des mykenischen Griechisch*, Heidelberg.
- Beek L. van, 2020, 'Greek ἀΐδιος, μινονθάδιος, ῥηΐδιος: Etymology, Phraseology, and Labiovelar Palatalization', *Glotta* 96, pp. 38–74, <https://doi.org/10.13109/glot.2020.96.1.38>.
- Beekes R. S. P., 2010, *Etymological Dictionary of Greek*, Leiden.
- Brugmann K., 1913, *Griechische Grammatik*, München.
- Buck C. D., 1933, *Comparative Grammar of Greek and Latin*, Chicago.
- Buck C. D., 1955, *The Greek Dialects*, Chicago.
- Chantraine P., 1968, *Dictionnaire étymologique de la langue grecque*, Paris.
- Dubois L., 1986, *Recherches sur le dialecte arcadien I. Grammaire*, Louvain-la-Neuve.
- Egetmeyer M., 2010, *Le dialecte grec ancien de Chypre I. Grammaire*, Berlin–New York, <https://doi.org/10.1515/9783110217520>.

- Fortson B., 2010, *Indo-European Language and Culture*, 2nd ed., Malden.
- Francis E. D., 1973, 'Heracl. *enediōkóta*,' *Indogermanische Forschungen* 78, pp. 100–105.
- Frisk H., 1960, *Griechisches etymologisches Wörterbuch*, Heidelberg.
- Hamp E. P., 1960, 'Notes on Early Greek Phonology,' *Glotta* 38, pp. 187–203.
- Lejeune M., 1972, *Phonétique historique du mycénien et du grec ancien*, Paris.
- LIV² = *Lexikon der indogermanischen Verben* = H. Rix et al. (ed.) *Lexikon der indogermanischen Verben*, 2001, Wiesbaden.
- LSJ = *A Greek-English Lexicon* = H. G. Liddell, R. Scott, 1996, *A Greek-English Lexicon*, 9th ed., Oxford.
- Mańczak W., 1988, 'O nieregularnym rozwoju fonetycznym spowodowanym frekwencją,' *Biuletyn Polskiego Towarzystwa Językoznawczego* 41, pp. 105–111.
- Meillet A., 1894, 'De quelques difficultés de la théorie des gutturales indoeuropéennes,' *Mémoires de la Société linguistique de Paris* 8, pp. 277–304.
- Meier-Brügger M., 2003, *Indo-European Linguistics*, Berlin–New York.
- Nikolaev A., 2010, 'A New Argument Against the Assumption of an 'Aeolic Phase' in the Development of Homeric Epic Diction,' [in:] *Indoeuropejskoje jazykoznanije i klassičeskaja filologija XIV*. Proceedings of the Tronsky Memorial Conference. 21–23 June 2010. St. Petersburg, pp. 229–245.
- NIL = *Nomina im Indogermanischen Lexikon* = D. S. Wodtko, B. Irslinger, C. Schneider (eds.), 2008, *Nomina im Indogermanischen Lexikon*, Heidelberg.
- Parker H., 2013, 'Palatalization of Labiovelars in Greek,' [in:] A. Cooper, J. Rau, M. Weiss (eds.), *Multi Nominis Grammaticus*, Ann Arbor, pp. 214–227.
- Pedersen H., 1939, 'Zur Theorie der altgriechischen Palatalisierung,' *Travaux du Cercle Linguistique de Prague* 8, pp. 289–291.
- Rix H., 1976, *Historische Grammatik des Griechischen*, Darmstadt.
- Schmidt J., 1881, 'Zwei arische a-Laute und die Palatalen,' *Kuhns Zeitschrift für vergleichende Sprachforschung* 25, pp. 1–179.
- Sheets G. A., 1975, 'Palatalization in Greek,' *Indogermanische Forschungen* 80, pp. 118–168.
- Sihler A., 1995, *New Comparative Grammar of Greek and Latin*, Oxford.
- Stephens L. D., Woodard R. D., 1986, 'The Palatalization of the Labiovelars in Greek: A Reassessment in Typological Perspective,' *Indogermanische Forschungen* 91, pp. 129–154.
- Sowa W., 2011, 'Griechische Dialekte, dialektale Glossen und die antike lexikographische Tradition,' *Glotta* 87, pp. 159–183, <https://doi.org/10.13109/lot.2011.87.14.159>.

- Szemerényi O., 1966, 'The Labiovelars in Mycenaean and Historical Greek,' *Studi Micenei ed Egeo-Anatolici* 1, pp. 29–52.
- Vaan M. De, 2008, *Etymological Dictionary of Latin and the Other Italic Languages*, Leiden.
- Weiss M., 1994, 'Life Everlasting,' *Münchener Studien zur Sprachwissenschaft* 55, pp. 131–56.