

Autosegmental phonology and word-internal -h- in Mycenaean Greek

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1. Background

The decipherment of Linear B provided evidence that a characteristic sound change of Greek, namely the disappearance of inherited *s in initial and intervocalic position, had already taken place in the 14th-13th centuries BC. The evidence for this development takes two forms:

a) the absence of s in places where it is historically reconstructible: *e-me* (instr.) < **sem-* ‘one’, etc.¹

b) the presence of sign 25, a ‘doublet’ sign for *a* which is conventionally transcribed *a*₂. This sign is generally found where *ha* < **sa* is expected: *pa-we-a*₂ [p^harwe^ha] < **p^harwes-a*, neut. plur. of *p^harwos* (φᾶρος) ‘garment, cloak’. However, writing systems are notoriously conservative, and the use *a*₂ by Mycenaean scribes could be an example of this. Furthermore, a property of the doublet signs is that their use is ‘facultative’ (Lejeune 1966: 137), or optional: they can be replaced or spelled out by the ‘fundamental’ signs (although *a*₂ is different from other doublets insofar as *ha* cannot be spelled out using other signs).

The phonetic status of the [h] implied by *a*₂ was not questioned in the years following the decipherment, while more important problems of the orthography and phonology were being worked out. But in the late 1960s different views were argued: Ruijgh

¹ Generally transcribed [h^hemei], but see Hajnal’s arguments for [h^heme:] (1995: 245).

(1967) and Lejeune (1965*a*, 1966) accepted the possibility that intervocalic *-h-* existed in Mycenaean, though with some reservations; Lejeune added in his *Phonétique historique*, 'il est tentant de supposer que l' «aspiration» intervocalique était débile à date mycénienne' (1972: 90). Szemerényi, however, wrote an important survey article on the decipherment, in which he argued that *-h-* had already disappeared by the time of the tablets (1968: 719).

The evidence from the tablets is complicated by a number of factors: in particular, the unmarked sign *a* is sometimes employed where *a₂* might be expected on historical grounds. The significance of this has to be weighed against the fact that – even when we exclude the psilotic dialects – there is startling variation in aspiration in the dialects of Classical Greek, including variation within conventionally-delineated dialects.² In the following discussion of words in which *-h-* might be reconstructed on historical grounds we shall examine both the phonological and the morphological environment, and try to determine the categories in which an aspirated pronunciation (word-medial) is probable at the time of the tablets. Scepticism about the existence of *-h-* is partly due to the impression that the data are chaotic, especially in the following cases: i) variation *a₂ ~ a*, ii) variation *VV ~ VjV*. Two approaches are helpful: sorting the words into categories based on criteria such as morphology and provenance makes the spelling appear less random; and contextualizing the problem in the wider framework of the historical Greek dialects (in which the aspirate does not follow all the rules of a regular phoneme, but is subject to irregular processes which are best viewed as trends rather than 'laws') makes the Mycenaean situation appear less exotic. A premise of the argument will be that the aspirate has different properties from other elements in the phonemic inventory of Greek, and a different place in the phonological structure.

² See Dubois (1988: i. 47–53) on the wide variation across a relatively small territory such as Arcadia.

2. *s in medial cluster following a resonant

2.1 Syllable-initial *s in medial cluster (VRhV-, where R = any resonant)

a) *a-ni-a* 'reins' (PY and KN: never spelled with a_2): initial aspirate in Attic ἤνία. However, the word was not uniformly aspirated in alphabetic Greek: cf. ἀνιοχίδων nine times in *IG V/1. 213*, a text in which both initial and intervocalic <H> are consistently noted.³ Whatever the etymology of the word (see *Diccionario micénico* s.v.), if we accept the prevailing view that its immediate predecessor was **ansia* (rather than **ānsia*),⁴ there are a number of possible realizations underlying the Mycenaean writing:

1. [a^hniai]/[a^hniai]: $s > h$, but monophthongization and compensatory lengthening have not yet occurred (this account of CL is offered by Lejeune, Kiparsky 1967, Anderson-De Chene 1979; these authors do not necessarily commit themselves to a pre- or post-Mycenaean date for the process)
2. [a^hniai]/[a^hniai]: $s > h$, and resyllabification with CL has occurred (Steriade 1982)
3. [a:niai]: $s > h$, and (with *a* lengthened by whatever process) $h > \emptyset$
4. [^ha:niai]: $s > h$, and (with *a* lengthened by whatever process) *h* has become associated with the onset of the previous (initial) syllable. In this case *a* would stand for a_2 .

Since, following Steriade, I find, it difficult to believe that [s] (a segment in Greek) could have been replaced by [h] (an auto-segment)⁵ without resyllabification and CL, I assume that [2] is the most likely outcome in Mycenaean. See also [16] below.

³ Buck no. 71, Schwyzler no. 12; Laconia, fifth century BC.

⁴ Morpurgo [Davies] (1960: 324 n. 12, 334 n. 40) with references.

⁵ An autonomous segment which is associated with a full segment occupying a regular 'skeletal' position in the syllabic structure of a word, rather than occupying such a position itself (Goldsmith 1979; Steriade 1982: 154ff. for application in a Greek context).

b) *o-wo* 'ear, handle'. Attested only in compound adjectives: PY *a-no-we* 'with no handles', *o-wo-we* 'with one handle', *ti-ri-jo-we-ti-ri-o-we-e* (three), *qe-to-ro-we* (four); KN *a-no-wo-to* 'with no handles'. Szemerényi (1967) demonstrated that the Greek forms derive from **ousos*, gen. **ousesos* (later **ou-atos*). We can extract from the above the Myc. word for 'ear' in the form *o-wo*. None of the alphabetic Greek forms of this word is attested with aspiration (Attic οὐς, ὠτός), though ἦνίαι should warn us that this may be an accident. The *a*-vocalism attested in other IE languages is found in the word for 'cheek': Attic παρεά, Lesb. παραύα < **parausā* : a Myc. form *pa-ra-wa* presumably lies behind *pa-ra-wa-jo* 'cheek-pieces' (dual).⁶

Szemerényi (1968: 719) used *o-wo* and *pa-ra-wa* as evidence that intervocalic *h* had disappeared in Mycenaean: he argued that – with intervocalic *h* still extant – 'ear' should have been [ouhos], and spelled *o-u-o* (and similarly that *pa-ra-wa-* cannot represent [parauha-]). This argument, however, depends on the following reconstruction of the realization of Myc. *o-wo*:

5. [owos] < *[ouhos] < *[ousos]

**ouhos* is an odd form: notation of the glide with *u* almost suggests a pronunciation [u:] as in French *route* rather than [ow]. We could instead (in line with the analysis of *a-ni-a*) twitch the notation and suppose the following:

6. [ɔ:w^hos]/[ɔ:h^hwos] < *[owsos]⁷

and similarly for *pa-ra-wa*

7. [para:w^ha:]/[para:h^hwa:] < *[parawsa:]⁸

As for *me-no*, the gen. sg. of 'month' (Attic μηνός < **mēns-os*), it

⁶ Szemerényi (1967: 63). For the vowel difference see also Beekes (1972: 124).

⁷ One could also imagine [oww^hos], given the likely existence of [RR] alongside or in place of [R] in Arcado-Cypriot: examples and discussion by Wyatt (1973: 41-45). And *mut. mut.* for all examples given here. So also Ruy Pérez (1971), though he argues that for *o-wo* etc. 'les données mycénien-nes apportent un témoignage précieux pour l'absence de l'aspiration'.

⁸ According to Szemerényi (1967: 64) there was no CL when **ousos* > **owos*; the long *a* in **parāwā* comes from **para+aus-*.

is perfectly easy to imagine *[me:nsos] > Myc. [me:n^hos] or even [me:nos], rather than the [me:nhos] which, according to Szemerényi, would be syllabified *mēn.hos* and written **me-o*.

c) *a-wo-i-jo* (man's name, PY and KN). This is plausibly identified as an adjective derived from the word 'dawn'; if so, it would be useful evidence for another word with a syllabic structure very similar to the word for 'ear' (there are plenty of onomastic parallels for 'dawn',⁹ though the adj. could also mean 'eastern'). The word is not spelled with initial *a*₂, in spite of the aspirate in Attic.¹⁰ We could hypothesize the following development (see Kiparsky 1967: 624 for IE **awsōs* rather than Lejeune's **āwsōs*):

8. [a:w^ho:s] written *a-wo* < **aws-ōs*

This would give an adjective *a-wo-i-jo* :

9. [a:w^ho^hios] < **awsos-yos*.¹¹ For the Myc. realization, cf. Ruijgh's 'ΑΦῶιος (1967: 57, 207).

2.2 Syllable-initial **s* between resonants (VR*h*RV-, where R = any resonant)

a-mo 'wheel' (PY and KN, never spelled with *a*₂). Initial aspirate in classical ἄρμα (usually plur.) 'chariot'. The regular derivation of Greek ἄρμα is **ar-smḡ*, but absence of *a*₂ led Lejeune to posit **ar-mḡ* instead.¹² However, the case is very similar to the preceding and (following Ruijgh) an analogous reading is possible:¹³

⁹ Compare also the name *a-e-ri(-qe)* PY Jn 832.11, [a:w^heris] vel. sim. < **awseri* (loc. of **aws-ēr* 'dawn, morning', Kiparsky 1967: 625). Differently Frisk *GEW* s.v. ἤρι.

¹⁰ Although Ruijgh (1977: 260) argues that West Greek ἄ(F)ῶς owes loss of aspiration to the influence of ἄμῆρα 'day'.

¹¹ Cf. αἰδοῖος < **aidosyos*, and Kiparsky (1967: 633).

¹² Lejeune (1960: 17, n. 44), repeated in his *Phonétique historique* (1972: 138).

¹³ Ruijgh (1967: 61) proposes a series of aspirated resonants (*n^h*, *m^h*, *r^h*, *l^h*, *w^h*) in Mycenaean, but his phonological reading /ar^hm^ho/ recognises the auto-segmental nature of the aspiration.

11. [ar^hmo]. The aspiration could equally well be associated with either the *r* or the *m*: bidirectional spreading is characteristic of autosegmental features, and is in any case anticipated by the tendency of *s* in Greek to spread across syllables.¹⁴

3. Intervocalic **s* (VhV-): onset of the second syllable

a) *i-je-re-u* 'priest' PY (normal spelling: so also *i-je-re-ja* 'priestess' PY, KN; *i-je-ro* 'sacred' PY, KN); *i-e-re-u* twice, PY.¹⁵ Initial aspirate in Attic ἱερεύς etc. (though unexpected variation in the dialects); the parallel in Skt. *iṣirá-* suggests proto-Greek **isero-*. Since the writing of the glide is standard in Mycenaean it is difficult to believe that the alternation *i-je-* ~ *i-e-* could be purely graphic: scholars are right to see the older form behind *i-e-re-u*:

12. [ihereus]: *s* > *h*

The normal spelling *i-je-re-u* is open to different interpretations:

13. [hi^vereus]: *s* > *h*, *h* has moved to initial position leaving a potential hiatus, which is filled instead by the glide.

However, the lack of *h*-movement implied by the spellings of *a-ni-a* and *a-wo-i-jo* makes the following reconstruction more attractive:

14. [iy^hereus]: *s* is deleted, the aspirate combines with the glide inherent in the preceding semivowel to form a new onset.¹⁶ In this case, although we accept the reasoning behind [12], the two spellings *i-je-* ~ *i-e-* are now less distinct: both attempt to

¹⁴ Epigraphic ἀριστοῦς etc., see Lejeune (1972: 286). Autosegmental spread described in Goldsmith (1979: 50).

¹⁵ *i-e-re-u* PY En 74.16 and En 659.4 by the same scribe as *i-je-re-u* Ep 539.13

¹⁶ More or less equivalent to the 'progressive assimilation' suggested by Ruijgh (1967: 56), who however considers that *h* 'avait en mycénien la valeur d'une consonne normale', except that after a long *u*-diphthong (**āusōs*) 'h intervocalique (< *s*) semble avoir perdu la valeur d'une véritable consonne' (Ruijgh 1967: 53, 57).

represent the phonology of [14] (and since the onset of the second syllable was composed of a slippery mixture of glide and aspirate, there may indeed have been some fluidity). A parallel explanation could be offered for *ko-ri-a₂-da-na* ~ *ko-ri-ja-da-na* ‘coriander’ (MY, same tablet).

b) *we-a₂-no-i* ‘robes’ (PY, twice), dat. plur. of **wesanos*. Later (epic) ἔανός shows initial aspirate, but no metrical trace of digamma. The morphology is obscure (noun and adj. in Homer have short and long *a* respectively): if from **wes-a-* we could speculate that intervocalic *h* was maintained under the influence of related forms such as *[we:^hma], putative Myc. ancestor of εἶμα (Skt. *vasman-*), and the associated verb (cf. *Iliad* 23. 67 τοῖα περὶ χροῖ εἶματα ἔστο, ‘in such garments was he clad’):

15. [we:^hanos]

Indeed, we need to keep the *-h-* until the post-Mycenaean but pre-Homeric shift to [w^he.anos] has occurred, if we want to maintain a development parallel to that of ἱερεύς in 3(a) above.

4. Initial *s → intervocalic *s in compounds

A special case of intervocalic *h* < **s* arises in compounds in which the second member began with *h-*. These cases are complicated by imperfect understanding of the ‘rules’ of composition in the Mycenaean period, and aggravated by ambiguities in the orthography. Analogy of the *simplex* and its relatives will clearly have played a role.

a) *a-ni-o-ko* ‘charioteer’ (hapax, KN: the third sign is damaged). If we assume that Grassman’s Law (the dissimilation of aspirates) was not post-Mycenaean, we start with a *nomen agentis* [ok^hos] rather than [h^hok^hos]:

16. [a:^hni.ok^hos]

A difficulty remains, however, in the use of the sign *-o-* instead of the glide *-jo-*. The noun is always written *a-ni-ja*, and cf. PY *e-pi-ja-ta* [ep^hialta:s] < *[epi^halta:s] (PY An 115, man’s name).

Palmer uses this word as support for the earlier operation of Grassman, arguing that ‘the elision of the final vowel of $\acute{\alpha}\nu\tau\alpha-$ or $\acute{\alpha}\nu\tau\iota\omicron-$ is difficult to understand if the second element of the compound still began with the aspirate’.¹⁷ There is a parallel in the alternation *ti-ri-jo-we* (plur.) ~ *ti-ri-o-we-e* (dual), and an attractive solution is to follow Ruijgh in assuming that the use of the glide was irregular between elements of a compound; this would presumably correspond to some phonic reality, but finds an orthographic parallel in the irregular use of the word divider (so *ke-re-si-jo we-ke* ‘ΚρησιοΦεργής’).¹⁸ In this case the medial *-o-* belongs with the second member of the compound (*-o-ko*) rather than the first: we could assume elision (hyphaeresis) of the previous vowel, for which compare the names *wa-tu-wa-o-ko* [wastuwa:ok^hos] (PY An 519) and *wa-tu-o-ko* (PY Ea 136).¹⁹

This element is also found in *ko-to-no-o-ko*, ‘holder of a κτοίνᾱ [lease]’ (PY, over 20 instances): support for the notion that compounds in *-οχος* were subject at this period to semantic analysis (into constituent elements) comes from PY Aq 64.12, where the participial phrase *ko-to-na e-ko-te* ‘κτοίναντες ἔχοντες’ is followed by a list of personnel and is functionally equivalent to (nom. plur.) *ko-to-no-o-ko*. We interpret this word as

¹⁷ Palmer (1980: 232). Ruijgh (1967: 44-6) had argued that Grassman was post-Mycenaean, which of course entails separate operation of the sound-change in all dialects, including West Greek and Pamphylian; against this Janko (1977). Ruijgh’s suggestion (1967: 106) that *a-ni-o-ko* could be derived from **ansi-* (a stem formed to **ans-*) is not impossible.

¹⁸ Ruijgh (1967: 46, fn. 10), comparing *wa-tu-o-ko*, *Φαστυ-οχος* (PY Ea 136), on which see below. TH Fq 278.3 *ku-su-a₂[-pa]* would be an analogous example of the alteration of normal spelling rules in a compound form; the editors of *TFC* i compare *ku-su-pa* and worry about the syllabification ξύ(v)-*haxav*. There is, however, no need to regard the *-n* as a non-original part of the preposition.

¹⁹ Leukart (1994: 69, n. 70) also derives [h^ha:niok^hos] < *[h^ha:nia:ok^hos] by hyphaeresis, though starting from *[an^hia:^hok^hos] with loss of the second aspirate by haplology. He identifies [wastuwa:] as an old collective, like *[an^hia:] ‘reins’ (1994: 155).

17. [ktoino.ok^hos]

and note that the common transliteration κτοινοῦχόχος would entail an *h* in the transliteration of *e-ke* 's/he has', etc.²⁰

b) a-u-po-no: personal name (KN U 4478.4), widely interpreted as [a+hupnos] 'sleepless'.²¹ The privative *a-* rather than *an-* indicates that the following *u* is to some degree aspirated (*hupnos* < **sup-*). In this case the maintenance of the aspirate will have been supported by the simplex and related forms:

18. [a^hupnos]

c) o-pi-a₂-ra 'coastal regions', neut. plur. (PY An 657.1). Identified by Ventris and Chadwick (1956, no. 56) as a compound of ὀπί + ἄλς 'sea'.

19. [opi^hala]

Compare the name *a-pi-a₂-ro*, later Ἀμφιάλος (PY, half a dozen instances). In these two cases also we assume that semantic and morphological transparency helped maintain the intervocalic aspirate.

5. Intervocalic *-s + a at the boundary of an inflectional ending (-Vh+V-)

Since this is the best-known category in the discussion of intervocalic aspiration all the instances which have a reasonably secure interpretation are given.

²⁰ The final vowel of [ktoina:] has apparently been replaced by the 'liaison vowel' of composition, normal in *a*-stems: so Lejeune (1965*b*: 16-17), who compares Hom. ὕλο-τόμος. But Leukart (1994: 315) sees in [ktoino-] '[ein] morphologisch fixiertes Zeugnis der ursprünglich in solchen Fällen normalen Eintretens der bloßen Stammform (hier auf *-o-), da -ā/-aH₂ zu jener Zeit noch Flexions-, nicht Ableitungs- bzw. Stammbildungsmorphem war'.

²¹ So already Ventris-Chadwick (1956: 97), followed by Lejeune (1958).

a) *s*-stem nouns and adjectives, neuter plural

*a-ke-a*₂ (PY Vn 130.2): suggested **anges-a* (class. ἄγγος) 'vessels'

e-ke-a (KN R 1815): **enk^hes-a* (class. ἔγχος) 'swords'

ka-ka-re-a (KN R 1815): **k^halkāres-a* (Hom. χαλκήρης) 'bronze',²²

ke-ra-a (KN K 872.1): **keras-a* (class. κέρας) 'horn'

*ke-re-a*₂ (PY Ta 641.1a): **skeles-a* (class. σκέλος 'leg')

*no-pe-re-a*₂ (PY 3×): **nōp^heles-a* (cf. class. ἀνωφελής), 'useless'

*pa-we-a*₂ (KN 3×, MY 2×) **p^harwes-a* (class. φᾶρος), 'pieces of cloth'

~ *pa-we-a* (KN 27×)²³

tu-we-a (PY Un 267.3): **t^huwes-a* (class. θύος), 'aromatics'

*we-je-ke-a*₂ (PY 3×): adj., meaning uncertain

~ [we-]je-ke-a (PY Wa 1148.2)

we-we-e-a (KN 2×): **werwes-eya* (cf. class. εἶρος), 'woollen'

In this case all examples from Pylos have *-a*₂ except Un 267 *tu-we-a*; and all examples from Knossos have *-a* except for one scribe's *pa-we-a*₂.

b) Perfect participles in **-wos-*, neut. plur.

a-ra-ru-wo-a (KN 9×): **ararwos-a* (cf. Hom. ἀρηρότα), 'fitted (with)'

*te-tu-ko-wo-a*₂ (PY Sa 682): **tetuk^hwos-a* (class. τεύχω) 'finished'

~ *te-tu-ko-wo-a* (KN L 871b)

The distribution of *-a*₂ ~ *-a* is similar to (a) above. In spite of the writing *-wo-a* at Knossos, the absence of remodelling with *-t-* (λελυκότα) points to perceived presence of *-h-*.²⁴

²² See Ruijgh (1983: 395).

²³ KN *pa-we-a*₂ is exclusively by scribe 114 (tentatively assigned L 870 and L 871 also by CMIK: although these tablets contain the forms *we-we-e-a* and *te-tu-ko-wo-a*).

²⁴ See Brixhe (1991: 258-9) on whether this is a significant morphological 'archaism'.

c) Comparative adjectives in *-yos-, neut. plur

a-ro₂-a (KN 6x): **aryos-a* (cf. class. ἀρείων), 'better'

me-u-jo-a₂ (PY 11x): **mew(i)yos-a* (cf. class. μείων), 'lesser'

me-zo-a₂ (PY 11x): **megyos-a* (cf. class. μείζων), 'greater'

The distribution of -a₂ ~ -a is similar to (a) and (b) above.

In (a) to (c) above scribes at Pylos write -a₂ with great consistency. This, combined with the morphological pressure that is likely to have existed in these categories, leads us to conclude that the intervocalic aspiration was still a reality:

20. [p^harwe^ha], [tetuk^hwo^ha], [mewyo^ha]

There are two possible explanations for the Cretan data: i) phonological change had deleted the intervocalic -h-, or was in the process of doing so, ii) there was a different spelling convention on Crete.²⁵ The situation is muddled by arguments over the date of the Knossos tablets: if they are indeed earlier than the mainland caches, then one could suppose that a spelling development that was *in statu nascenti* on Crete had become the norm some two centuries later on the mainland.²⁶ If the dates are irrelevant, then use of this extra sign for an isolated aspirate may have been less widespread among Cretan scribes; or (assuming the Minoan language still survived on Crete) the local scribes may have avoided sign *25 because they were aware of the sound (for example, a pharyngeal) that it had been originally used for. The reason that ii) seems preferable is that the figures of Duhoux (1990: 361) show that the development of intervocalic [j] > [h] is more advanced at Knossos than at Pylos; in this case it is difficult to argue that intervocalic aspiration was also disappearing. It would be possible to make a case for [j] > zero, but the disappearance from the dialect of both [h] and [j], important intervocalic glides, seems implausible.

²⁵ In the terminology of Duhoux (1990: 362), it was not at Knossos one of the 'règles orthographiques contraignantes'.

²⁶ Palmer's suggestion (1963: 3) that the difference (which he interprets as phonological) is evidence for the later dating of the Knossos tablets is rightly dismissed by Ruijgh (1967: 55).

6. Intervocalic **-s* in inflectional endings: followed by *e, i, o*
(-Vh+V-)

In this category the syllabary has no way to signal aspirated vowels, if they were present. We are left to guess between hiatus and preservation of intervocalic aspiration. Considerations which encourage the view that the aspiration was present include:

- i) scribes (at Pylos and Thebes) use *-a₂* where possible
- ii) the fact that these are not isolates but participate in both a paradigm (other forms of the same word) and a morphological category (other words in the same case) will in many cases have provided analogical support for the presence of an *s*-allophone. The *s* was already restored in certain categories: the sigmatic aorist/future (*do-se* [do:sei] PY Un 718),²⁷ and the consonant-stem dat.-loc. (examples at §6.2*b* below)
- iii) forms such as *a-u-po-no* ([18] above) and TH Fq 254.1 *a-pi-e-qe* (cf. ἀμφιέπω) provide evidence that intervocalic aspiration was a phonological possibility.

6.1 Intervocalic **-s* at the boundary of an inflectional ending
(-Vh+V-)

- a) *s*-stem nouns and adjectives: e.g. *we-te-i* (PY): dat. sg. **wetes-i*,
'year'
21. [wete^hi]
- b) Comparative adjectives: e.g. *a-ro₂-e* (KN): nom. pl. **aryos-es*,
'better'
22. [aryo^hes]
- c) Verbal endings: e.g. *e-e-si* (KN): 3 pl. **es-enti* 'be'
23. [e^hensi]

²⁷ But not Resonant-stems: *de-me-o-te* [deme^hontes] PY An 35. and *da-ma-o-te* [dama^hontes] KN X 1051. See Risch (1982: 331).

6.2 Intervocalic *-s within inflectional endings (+VhV-)

a) Intervocalic *s in a-stem gen. plur. **ā-sōm*24. fem. *ko-to-na-o* (PY) [ktoina:^ho:n] 'plots of land'25. masc. *e-re-ta-o* (PY) [ereta:^ho:n] 'rowers'²⁸b) Intervocalic *s in dat.-loc. plur. *-*oisi* (thematic declension), *-*a(i)si* (a-stems)

The thematic declension offers two endings in the category corresponding to the classical dative plural: *-o* and *-o-i*. Since [oi]/[o:i] diphthongs are usually written *-o* in Linear B, we interpret *-o-i* as a disyllabic ending, which continues *-*oisi* (later *-oισι*, with the *-σ-* analogically restored), and which maintains the original dat.-loc. function. The instrumental [-ois]/[-o:is] would on this view be represented by *-o* (this analysis has some support from the functional distribution in the tablets of forms from the *a*-stem, thematic, and consonant-stem declensions).²⁹ If this is right, the influence of the monosyllabic ending in [-ois]/[-o:is] will have contributed to maintaining intervocalic *h*; in consonant stems the intervocalic *-s-* was already restored at the time of the tablets (e.g. *ti-ri-si* PY Ub 1318.4, *ka-ke-u-si* PY 2x).³⁰ Compare also PY *pe-i*, now generally interpreted as [sp^he^hi] in the light of Arcadian σφεσι.³¹

Similar considerations apply to *a*-stem endings in *-a-i*, which could stand for inherited [-a:^hi] or later (contaminated) [-ai:^hi] (the monosyllabic ending denoted by *-a* is less securely attested; a

²⁸ The masculine gen. sing. is graphically identical: *su-ḡo-ta-o*. It is difficult to know how to interpret this form: it may be built like the Arcadian gen. sg. in *-av*, with *-o* added to the stem.

²⁹ So Risch (1982: 331 with n. 40), against Ruijgh (1967: 76–8), Kiparsky (1967: 123). Basic data in Lejeune (1969: §70), overview of the arguments by Morpurgo Davies (1985: 98–100).

³⁰ No doubt on the analogy of *ze-u-ke-si* < *-*es-si* etc. Forms such as TH (x7) *ka-si* 'geese' may represent [k^ha:nsi], [k^hä:si] or [k^ha:si]. Cf. Risch (1982: 331).

³¹ Mantinea, IV c. BC (*SEG* 37, 1987, 340.15). So Dubois (1988: i. 123), Hajnal (1995: 331, n. 411).

possible example of the instr. in *qe-qi-no-me-na* at PY Ta 707.2, 708.2).

Selected examples:

26. *o*-stems, dat. plur.

e-pe-to-i (TH Gp series) [h^herpetoi^hi] 'serpents'

te-o-i (KN 15x, PY 2x) [t^he^hoi^hi] 'gods'

27. *a*-stems, dat. plur.

a-ke-ti-ri-ja-i (PY Fn 187.15) [aske:tria:^hi] 'decorators' (Killen 1979: 165)

ku-na-ke-ta-i (PY Na 248, TH) [kuna:geta:^hi] 'hunters'³²

28. *a*-stems, loc. plur.

te-qa-i (TH Ft 140.1) [t^heg^wa:^hi] 'Thebes'

c) Infinitive ending in **-sen*, **-esen*

29. *te-re-ja-e* (PY x4) [teleia:^hen], *a-na-ke-e* (PY Aq 218) [anage^hen]

7. Inherited **s*

There are also of course words with inherited intervocalic **-s-* in Mycenaean, such as *zo-a* < **yos-ā*, an abstract noun 'boiling' (KN 9x), and *te-o*, 'god'. Such words are likely to lack morphological but may have analogical support (from related lexemes) for the presence of an intervocalic *s*-allophone.

8. Evidence for *h* < **y*

It is probable that the phonological development **y- > *h-* was in process at the time of the tablets³³ (**y-* to *z-* has already taken

³² Not [kun^ha:geta:^hi]. For the derivation from ἄγω rather than ἰγγέομαι see Leukart (1994: 70f.).

³³ So Duhoux (1987) and (1990), on the basis of detailed study of the data. Brixhe (1989) and (1996: 83-4) has argued that [j] > [h] after the adoption of the script but before the date of the tablets.

place, though the phonetic nature of the Myc. *z*-series can only be guessed). Initial *a*₂- generally indicates the aspirate from **s*-, but in some instances may continue inherited **ya*-.³⁴ More common are internal doublets with *ja* ~ *a*₂ or (in the case of the other vowels), *jV* ~ *V*: thus in the adjective

*qe-te-a*₂ (PY, TH) ~ *qe-te-a* (KN)

qe-te-jo (PY, TH) ~ *qe-te-o* (KN, TH)

(The etymology is disputed, but the ending in *-eios* seems secure.) It has been argued that the *j*-series of Linear B can represent [h]; Palmer (1980: 42) claimed that 'intervocalically there is supporting evidence 1, that *-j-* may stand for the aspirate and 2, that *-a*₂- may be used instead of the glide *-j-*.' For the first statement the evidence quoted is *we-a-re-pe* (PY ×2) ~ *we-ja-re-pe* (PY ×4), but the derivation of the first element from **wes* ('clothe') is very dubious (compare the obscure first element of PY *we-je-ke-*), and the value of the sign *we* is disputed. Palmer's second statement is also doubtful: that Linear B *j* alternates with *a*₂ and zero does not prove that the *j*-series can denote [h] or that *a*₂ can denote [y]. It may equally well reflect phonological fluctuation (*j* > *h*); and the higher proportion of *j* writings in suffixes would be explicable in terms of morpho-semantic pressure.

9. Conclusion

Allowing for the generally peculiar status of the aspirate in Greek, there is every reason to believe that intervocalic [h] was a regular part of the phonology of Mycenaean Greek at the time of the tablets. A large majority of cases of intervocalic *h*- < **s* occurs in productive morphological patterns or in compounds, and this may

³⁴ IE **ya*- is not common in Mycenaean: in certain proper names built with **yag*- (classical ἄγιος, Skt. *Yaj*-): e.g. a toponym *a*₂-*ki-ja* 'Hagia' (see Ruijgh 1967: 168). Ruijgh (1967: 65) and Heubeck (1979: 241) offer *a*₂-*ke-te-re* (hapax, KN) < **iakestēres* (cf. ἄκος): vs. *ja-ke-te-re* (PY Mn 11.2).

have motivated the retention of underlying intervocalic /s/ and aspiration as a morphophonemic rule.

There is no evidence that this aspirate was affected by Grassman's Law, although initial *h-* < **s-* was affected. That *h-* < **s-* had started by the time of the adaptation of the Linear B script is implied by the employment of *a*₂ for [ha], and the completion of the sound change by the time of the earliest tablets (perhaps much earlier) is indicated by the presence of *s-* in imported words such as *sa-sa-ma* (class. *σησάμη*), and of non-Greek words such as *sukon* 'fig' and *sihalos* 'type of domestic pig'.³⁵ Since the adaptation of the syllabary is generally assigned to the emergence of Mycenaean palatial civilization at the beginning of the Late Bronze period (sixteenth century BC), this would give us an absolute *terminus ante quem* for the evolution of [s] into autosegmental [h].

The aspirate 'anticipation' which resulted in Classical forms such as εὔω < **ewhō* and ἱερέυς (3*a* above) is a tendency rather than a sound rule. The absence of initial aspirate in words such as Attic οὖς [o:s] 'ear' as against ἔως [h^heo:s] 'dawn' needs no particular explanation: so also for Myc. *a-ni-a* 'reins' and *a-mo* 'wheel'. Even Grassman's Law defies strict definition: as Collinge observes (comparing the number of times Themistokles is over-aspirated on ostraka), 'the ordinary Greek probably had imperfect *h*-control anyway'.³⁶ This appeal to autosegmental incontinence, plus careful analysis of the categories into which the data can be separated, provides a more persuasive account of the Mycenaean

³⁵ The number of cases of initial and intervocalic *s* 'enable us to make the suggestion that the *s* > *h* change did not occur at a point in time close to the writing down of Mycenaean in Linear B', Bartoněk (1987: 46). Ruijgh (1985: 157f.) argues that the formula Διὶ μῆτιν ἀτάλαντος (**diwei mētim smtalantos*) owes the spondaic scansion of μῆτιν to a following 'strong' *h-*, which would in effect give a *terminus ante quem* to the formula. But our premise at 2.1(*a*) above that [s] was replaced by an autosegment [h] with resyllabification is at odds with this explanation: see Watkins (1987) for a better explanation (but similar chronology).

³⁶ Collinge (1985: 53).

forms than a simple denial of intervocalic aspiration and appeal to orthographic conservatism.

References

- CMIK: Corpus of Mycenaean Inscriptions from Knossos*, ed. J. Chadwick et al. (Cambridge-Rome 1986-90).
- TFC: Thèbes. Fouilles de la Cadmée. I. Les tablettes de la Odos Pelopidou*, ed. V. Aravantinos, L. Godart, A. Sacconi (Pisa-Rome 2001).
- Anderson, S. R. / Chene, B. de (1979): 'Compensatory lengthening', *Language* 55, 505-35.
- Bartoněk, A. (1987): 'On the sources of juxtavocalic *s* in Mycenaean', in P. H. Ilievski and L. Crepajac (eds.), *Tractata Mycenaea. Proceedings of the 8th International Colloquium on Mycenaean Studies, Ohrid 1985* (Skopje), 41-8.
- Beekes, R.S.P. (1972): 'H₂o', *Die Sprache* 18, 117-31.
- Brixhe, C. (1989): 'Morphologie ou morphographémie?', *BSL* 84, 21-54.
- (1991): 'Du mycénien aux dialectes du I^{er} millénaire. Quelques aspects de la problématique', in D. Musti et al. (eds.), *La Transizione dal Miceneo all'alto arcaismo: dal palazzo alla città. Atti del convegno internazionale, Rome 1988* (CNR: Rome), 251-71.
- (1996): *Phonétique et phonologie du grec ancien, I. Quelques grandes questions* (Peeters: Louvain).
- Dubois, L. (1988). *Recherches sur le dialecte arcadien*, i-iii (Louvain-la-Neuve).
- Duhoux, Y. (1987): 'Linéaire B crétois et continental: éléments de comparaison', in P.H. Ilievski and L. Crepajac (eds.), *Tractata Mycenaea. Proceedings of the Eighth International Colloquium on Mycenaean Studies, Ohrid 1985* (Skopje), 105-28.
- (1990): 'La situation du yod en grec mycénien', *BSL* 85, 359-65.
- Frisk, H. (1954-1972): *Griechisches etymologisches Wörterbuch* (Heidelberg).
- Goldsmith, J. (1979): *Autosegmental Phonology* (Garland Press: New York).
- Hajnal, I. (1995): *Studien zum mykenischen Kasussystem* (Berlin & New York).
- Heubeck, A. (1979): 'Remarks on the sign-doublers *ro*₂, *ra*₂, *ta*₂', in E. Risch and H. Mühlestein (eds.), *Colloquium Mycenaicum 1975* (Geneva), 239-57.
- Janko, R. (1977): 'A Note on the Date of Grassman's Law in Greek', *Glotta* 55, 1-2.
- Killen, J. T. (1979): 'The Knossos Ld (1) tablets', in E. Risch and H. Mühlestein (eds.), *Colloquium Mycenaicum 1975* (Geneva), 151-81.
- Kiparsky, P. (1967): 'Sonorant clusters in Greek', *Language* 43, 619-35.

- Lejeune, M. (1958): 'Observations sur les composés privatifs', *Rev. Phil.* 32, 198-205. [*Mémoires de philologie mycénienne* 2, 37-45, Rome 1971.]
- (1960): 'Les dérivés en -ter-', *Rev. Phil.* 34, 9-30. [*Mémoires de philologie mycénienne* 2, 199-224, Rome 1971.]
 - (1965a): 'Restauration analogique de la sifflante intervocalique', *BSL* 60, 1-7. [*Mémoires de philologie mycénienne* 3, 155-62, Rome 1972.]
 - (1965b): 'La voyelle thématique dite de liaison', *BSL* 60, 12-17. [*Mémoires de philologie mycénienne* 3, 173-7, Rome 1972.]
 - (1966): 'Doublets et complexes', in L. R. Palmer and J. Chadwick (eds.), *Proceedings of the Cambridge Colloquium on Mycenaean Studies* (Cambridge), 135-49.
 - (1969): 'L'instrumental pluriel thématique', *Rev. Phil.* 42, 219-29. [*Mémoires de philologie mycénienne* 3, 255-66, Rome 1972.]
 - (1972): *Phonétique historique du mycénien et du grec ancien* (Paris).
- Leukart, A. (1994): *Die frühgriechischen Nomina auf -tas und -as: Untersuchungen zu ihrer Herkunft und Ausbreitung (unter Vergleich mit den Nomina auf -eús)* (Vienna).
- Morpurgo, A. (1960): 'L'esito delle nasali sonanti in Miceneo', *Rendiconti della Classe di Scienze morali, storiche e filologiche dell' Accademia dei Lincei* ser. 8, vol. 15, 321-36.
- Morpurgo Davies, A. (1985): 'Mycenaean and Greek Language', in A. Morpurgo Davies & Y. Duhoux (eds.), *Linear B: a 1984 Survey* (Louvain), 75-126.
- Palmer, L. R. (1963): 'The Find Places of the Knossos Tablets', in L. R. Palmer & J. Boardman, *On the Knossos tablets: two studies* (Oxford).
- (1980), *The Greek Language* (London).
- Risch, E. (1982): 'Ein Problem des griechischen Verbalparadigmas: Die verschiedenen Formen der 3. Person Plural', in J. Tischler (ed.), *Serta Indogermanica: Festschrift für Günter Neumann zum 60. Geburtstag* (Innsbruck), 321-34.
- Ruijgh, C. J. (1967): *Études sur la grammaire et le vocabulaire du grec mycénien* (Amsterdam).
- (1977): Review of M. Lejeune, *Phonétique historique du mycénien et du grec ancien*, *Lingua* 42, 249-65. [Repr. *Scripta minora* i, 522-38, Amsterdam 1991.]
 - (1983): 'Observations sur les neutres en -s/h-', in A. Heubeck and G. Neumann (eds.), *Res Mycenaee: Akten VII. Int. Myk. Coll.* (Göttingen), 392-407. [Repr. *Scripta minora* ii, 19-35, Amsterdam 1996.]
 - (1985): 'Le mycénien et Homère', *BCILL* 26, 143-190. [Repr. *Scripta minora* ii, 221-68, Amsterdam 1996.]

- Ruipérez, M. (1972): 'Le dialecte mycénien', in id. (ed.), *Acta Mycenaea I (Minos 11: Actes du Ve Colloque International des Etudes Mycéniennes, Salamanca)*, 136-69.
- Steriade, D. (1982): *Greek Prosodies and the Nature of Syllabification* (Diss. MIT).
- Szemerényi, O. (1967): 'The history of Attic οὐς and some of its compounds', *SMEA* 3, 47-88. [Repr. *Scripta Minora* iii, 1273-1314, Innsbruck 1987.]
- (1968): 'Mycenaean: a milestone between Indo-European and historical Greek', in *Atti e Memorie del I. Congr. Int. Mic. (Rome)*, 715-25. [Repr. *Scripta Minora* iii, 1315-25, Innsbruck 1987.]
- Ventris, M., and Chadwick, J. (1956), *Documents in Mycenaean Greek* (Cambridge).
- Watkins, C. (1987): 'Linguistic and archaeological light on some Homeric formulas', in S. Skomal and E. Polomé (eds.), *Proto-Indo-European: The Archaeology of a Linguistic Problem. Studies in Honor of Marija Gimbutas* (JIES Monograph), 286-98. [Repr. *Selected Writings* ii, 729-40, Innsbruck 1984.]
- Wyatt, W. F. (1973): 'The Aeolic Substrate in the Peloponnese', *AJP* 94, 37-46.