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SOMMARIO

THE MYSTERY OF THE MYCENAEAN 'LABYRINTH': THE VALUE OF LINEAR B *PU*$_2$ AND RELATED SIGNS

Anna P. Judson

Summary

This article re-examines the evidence for the value of the Linear B sign *pu*$_2$, in particular its appearance in the term *da-pu*$_2$*-ri-to-* 'labyrinth', and demonstrates that it stands specifically for the value /p^{h}u/ (contrary to the usual assumption that it represents both /p^{h}u/ and /bu/). It then discusses the further implications of this conclusion, in particular for the interpretation of the undeciphered signs **56* and **22*, which are often assigned to the same series as *pu*$_2$, as well as any other similar signs which may exist. This discussion illustrates the crucial impact that establishing a single sign's value may have on the wider understanding of the Linear B script, as well as on its relationship with its parent script Linear A and even the possibility of reconstructing aspects of the Minoan language.

INTRODUCTION

The Linear B script, used for writing records on clay tablets in the administrative centres of Late Bronze Age Crete and Greece, was deciphered in 1952 by Michael Ventris, who showed it to represent an early dialect of Greek, now known as 'Mycenaean'; but over sixty years later, there still remain significant debates over the values of certain Linear B signs. In this article, I focus on one such sign, *pu*$_2$ 𐀩, whose appearance in the term *da-pu*$_2$*-ri-to-* 'labyrinth' is the chief source of controversy over its interpretation. I reanalyse the evidence for *pu*$_2$'s value(s), in particular its use in *da-pu*$_2$*-ri-to-*, and demonstrate that determining the value of this single sign does not just affect our ability to interpret terms in which it appears, but has wide-ranging implications for our understanding of the structure of the Linear B script; for the prospect of assigning sound-values to some of the remaining undeciphered Linear B signs; for analysing Linear B's relationship with its parent script Linear A; and even for the possibility of reconstructing aspects of the 'Minoan' language of the Linear A texts.

THE VALUE OF *PU*$_2$

The Linear B script contains two main groups of syllabic signs (fig. 1): in addition to the 'core' signs representing either a pure vowel (*e.g. a*) or a single consonant plus vowel (*e.g. da*), there is a group of 'extra' signs, which may replace the core signs in certain circumstances. 'Doublet' signs replace a single core sign to specify a more precise sound-value than is possible using the (often ambiguous) core signs (*e.g. a*$_2$ = /ha/, while *a* can = /a/ or /ha/), while 'complex' signs replace two core signs in order to represent certain sequences more concisely (*e.g.* /dwe/ may be spelt *de-we*, *du-we*, or with the single complex sign *dwe*). The undeciphered signs, whose values remain unknown or uncertain, are mostly likely to belong to the extra signs, simply because there are relatively few possible 'gaps' in the core syllabary which could be filled by these signs (for an in-depth discussion of this issue, see Judson 2016).

The subject of this article, *pu*$_2$, has been recognised as one of the extra signs, and specifically as a doublet of the core sign *pu* (𐀪), since soon after the decipherment of Linear B (Palmer 1954, 66-67). Because the Linear B script does not generally mark aspiration or voicing of consonants (although these are distinctive features in Mycenaean as in classical Greek), signs in the core *p*-series can, in principle, represent any of three different sound-values:

Core signs					Extra signs		
a	*e*	*i*	*o*	*u*	*a*$_2$ /ha/	*a*$_3$ /ai/	*au*
da	*de*	*di*	*do*	*du*	*dwe*	*dwo*	
ja	*je*		*jo*				
ka	*ke*	*ki*	*ko*	*ku*			
ma	*me*	*mi*	*mo*	*mu*			
na	*ne*	*ni*	*no*	*nu*	*nwa*		
pa	*pe*	*pi*	*po*	*pu*	*pu*$_2$ /p^{h}u/, /bu?/	*pte*	
qa	*qe*	*qi*	*qo*				
ra	*re*	*ri*	*ro*	*ru*	*ra*$_2$ /rya, lya/	*ro*$_2$ /ryo, lyo/	*ra*$_3$
sa	*se*	*si*	*so*	*su*			
ta	*te*	*ti*	*to*	*tu*	*ta*$_2$ /tya/	*twe*	*two*
wa	*we*	*wi*	*wo*				
za	*ze*		*zo*				
Undeciphered signs							
**18*	**19*	**22*	**34*	**47*	**49*	**56*	
**63*	**64*	**65*	**79*	**82*	**83*	**86*	

Fig. 1. The Linear B syllabary.

a voiceless labial stop (/p/), a voiceless aspirated labial (/p^h/), or a voiced labial (/b/). The sign *pu* can, therefore, represent any of /pu/, /p^{h}u/, or /bu/.

pu$_2$'s status as a doublet of *pu* is clearly shown by several examples of the same term being spelt with both *pu* and *pu*$_2$: for instance, the same man's name is spelt *pu-ke(-o)* (dative/genitive) and *pu*$_2$*-ke* (nominative) by different scribes in the **MY Ge**-series, which records allocations of various spices (*pu*$_2$*-ke*: **Ge 602**.2, **605**.2B, **608**.4B, Hand 57; *pu-ke*: **Ge 604**.5, Hand 58a; *pu-ke-o*: **Ge 603**.2, Hand 59); an ethnic adjective at Pylos appears as both *a-pu*$_2$*-ka(-ne)* (singular/plural: **An 656**.13.20, **657**.13, Hand 1) and *a-pu-ka* (singular: **Aq 218**.15, Hand 21); and the word generally interpreted as 'labyrinth' is found as both *da-pu*$_2$*-ri-to-jo* (genitive, **KN Gg(1) 702**.2, Hand 103; cf. *da-pu*$_2$*-ṛị*[*-to-jo*, **KN Oa 745**.2, -) and *da-pu-ri-ṭọ*[(**KN Xd 140**.1, Hand 124; these forms will be discussed further below).[1] As a doublet, however, *pu*$_2$ should not simply be an alternative to *pu* – there are no known examples in Linear B of two signs having exactly the same value or range of values – but should specify more exactly which of the various possible values of *pu* is intended.

Most commonly, *pu*$_2$ is said to represent both the voiceless aspirate /p^{h}u/ and the voiced /bu/ (*e.g. DMic s.v. da-pu*$_2$*-ri-to-jo*; Davis 2014, 214-220; Melena 2014, 71-73), although it has sometimes been argued to represent only /bu/ (Witczak 1993) or only /p^{h}u/ (*e.g.* Lejeune 1972b, 95-96; Thompson 2005). As I shall demonstrate, this last interpretation – that *pu*$_2$ specifies only the aspirated value /p^{h}u/ – is strongly to be preferred, based on both the

1 Unless otherwise specified, all readings are given according to the following corpora: Knossos: *CoMIK*; *KT*^{5}. Pylos: *PTT*. Mycenae: *TITHEMY*. Thebes: Aravantinos *et al.* 2001-2006; 2008. Inscribed stirrup jars: Sacconi 1974a; Hallager 2011. Linear A: *GORILA*. Interpretations of Linear B terms are given as in *DMic*.

Term	Word Type	Interpretation	References
a-pu$_2$-de	toponym (+ allative suffix)		PY Vn 20.7
a-pu$_2$-ja	toponym	/Ap^{h}uia/?	PY Jo 438.11
a-pu$_2$-ka(-ne)	ethnic adjective (masculine nominative singular/ plural)		KN Uf(1) 111.ạ KN *Xd* <331> PY An 656.13 PY An 656.20 PY An 657.13
a-pu$_2$-we	toponym (dative-locative)		PY An 427.1 PY Cn 608.7 PY Jn 693.5 PY Jn 829.8 PY Ma 124.1 PY Qa 1294
da-pu$_2$-ra-zo	man's name		EL Z 1.2
da-pu$_2$-ri-to-jo	noun (masculine genitive singular)	/daPurint^{h}oyo/ 'of the labyrinth'**	KN Gg(1) 702.2 KN Oa 745.[2]
du-pu$_2$-ra-zo	man's name		KN Da 1173 KN V(3) 479.1
du-pu$_2$-so	man's name?		KN Fh 343
e-pu$_2$-no			KN Ga(2) 427.2 KN X 8295
i-ja-pu$_2$-we	toponym		KN Lc 646.C
]ja-pu$_2$-wi-ja	ethnic adjective (feminine nominative plural)		KN G 820.[2] KN Lc(1) 541.B
]ka-pu$_2$-ṣạ-jo			KN X 1018
ke-pu$_2$-jẹ-u	man's name		KN Vc(1) 7575
ki-pu$_2$-ri-ta-de*	toponym? (+ allative suffix)		TH Of 27.1
]pu$_2$-te-me-no	medio-passive participle	/[pe]p^{h}utēmenon/ 'planted, cultivated'	PY Er 880.2
pu$_2$-ke	man's name		MY Ge 602.2 MY Ge 605.2B MY Ge 608.4B
pu$_2$-ke-qi-ri(-ne)	man's name (or title?) (nominative/dative)	/P^{h}ugeg^{w}rīns, -nei/**	PY Ta 711.1 TH Gp 119.1
pu$_2$-ke-qi-ri-ne-ja	adjective (feminine nominative plural)	/P^{h}ugeg^{w}rineyai/**	TH Of 27.3
pu$_2$-ra$_2$-a-ke-re-u	toponym	/P^{h}ullāhagreus/?	PY Nn 228.3
pu$_2$-ra$_2$-a-ki-ri-jo	toponym	/P^{h}ullāhagrion/?	PY Na 425
pu$_2$-ra-ne-jo	man's name		KN B(5) 799.6
pu$_2$-re-wa	man's name		KN Sc 243 TH Of 26.1
pu$_2$-ru-da-ro	man's name?	/P^{h}ludaros/	KN Uf 432.3
pu$_2$-ṣi-ja-ko	man's name		PY Jn 310.17

pu_2-te-re	noun (masculine nominative plural)	/p^{h}utēres/ 'planters'	KN V(2) 159.4 PY Na 520.B
pu_2-ti-ja	man's name	/P^{h}ut^{h}iās/?	PY An 656.13 PY Jn 601.3
pu_2-to	man's name	/P^{h}ut^{h}os/?	KN Uf 1522.2
]pu_2-*34-[.]	adjective?		PY Wr 1374.γ
]-$ṗu_2$-[			KN X 9899.1
]$ṗu_2$-we-e-a_2[*			PY Un 853.11
re-u-ko-ro-o-pu_2-ru	man's name	/Leuk(r)ŏp^{h}rūs/?	PY Jn 415.2
si-ja-pu_2-ro	man's name		KN As(2) 1516.11 KN Xf [4492]
si-pu_2	man's name		KN As(2) 1516.4
su-ko-pu_2-te-e	title (or man's name?)	/sūkop^{h}utehe(i)/ 'fig-planter'**	TH Uq 434.7
ze-pu_2-ra_3/ ze-pu_2-ra-o	ethnic adjective (feminine nominative/genitive plural)	/Dzep^{h}urrai, -āhōn/ 'women from Zephuria'	PY Aa 61 PY Ad 664
ze-pu_2-ro	man's name	/Dzep^{h}uros/	PY Ea 56
[.]-$ṗu_2$-ta*			MY Oi 701.6

Table 1. *Corpus* of attestations of pu_2.
* Notes on readings:]$ṗu_2$-we-e-a_2 = possible reading for]-we-e-a_2 (*PTT*: **Xn 878**.2; now joined to **Un 853**: see *PoN*IV); $ḳi$-$ṗu_2$-ri-ta-de = possible reading for [. .]-ri-ta-de (*TITHEMY*; Aravantinos *et al.* 2001-2006); [.]-$ṗu_2$-ta = combination of readings in Sacconi 1974b ($ṇo$-pu_2-ta) and *TITHEMY* ([. .]-ta).
** See discussions of these terms' interpretations below. In the case of /daPurint^{h}oyo/, P = a labial consonant whose precise value is not specified.

evidence of this sign's attestations, given in Table 1, and wider considerations relating to the structure and development of the Linear B script.

It can be seen that there are several terms which, taken together, provide strong evidence that pu_2 can represent /p^{h}u/: these are discussed here in approximate descending order of the security of their interpretation.

pu_2-te-re and]*pu_2-te-me-no*: the only certain vocabulary words in which this sign is attested, apart from *da-pu_2-ri-to-jo* (which will be discussed below), both appearing in contexts relating to cultivation. *pu_2-te-re* is followed on **PY Na 520** (a tablet recording flax) by the verb *ki-ti-je-si* /ktiensi/ 'they bring into cultivation, plant' (cf. classical κτίζω, usually 'found, build, settle', but also 'plant': *LSJ*, from which all alphabetic Greek interpretations are taken unless otherwise specified), and]*pu_2-te-me-no* occurs on a tablet recording landholdings (**PY Er 880**), so that the interpretations /p^{h}utēres/ 'planters' and /[pe]p^{h}utēmenon/ 'cultivated, planted' are contextually extremely plausible. Although the latter interpretation requires the restoration of *pe-*]*pu_2-te-me-no*, this seems relatively secure since *-me-no* is clearly the medio-passive participle ending /-meno-/.

su-ko-pu_2-te-e: either a man's name (Aravantinos *et al.* 2008, 26) or a title, in the dative or instrumental (Thompson 2014, 164-165). Given the existence of a group of people at Pylos designated as *o-pi-su-ko* /opi-sūkoi/ 'superintendents of figs' (cited as a parallel by both Aravantinos *et al.* and Thompson), a title seems more probable; but even if it is a name, the length of the term and the fact that both elements of the compound are already attested in Mycenaean Greek make the interpretation /sūko-p^{h}utehe(i)/ 'fig-planter' a compelling one.

Etymological interpretations of personal or place-names are usually much less secure than this, since it is generally not possible to confirm any possible interpretation contextually. Some of the interpretations given

above seem plausible enough: for instance, *pu$_2$-ke-qi-ri(-ne)* (which is probably a name, rather than a title as stated by *DMic*) is commonly interpreted as /P^{h}uge-g^{w}rīns, -nei/ (and the related adjective *pu$_2$-ke-qi-ri-ne-ja* as /P^{h}uge-g^{w}rineyai/ 'women belonging to/working for P.'), with the initial element related to φ(ε)υγ- 'flee' and the second to βρῖ, βριθύς 'heavy' (Lejeune 1972c, 152, n.63; García Ramón 2009); *ze-pu$_2$-ra$_3$*/*ze-pu$_2$-ra-o* is interpreted as an ethnic adjective referring to women from Zephyria (an older name for Halikarnassos) – although this is far from certain, it seems a reasonable possibility given the presence of other groups in the **PY A-**series who appear to originate from the east coast of Anatolia and other places around the Aegean.[2] Some degree of uncertainty, however, must always remain in interpreting names, place-names, and ethnic adjectives.

Nonetheless, the evidence of *pu$_2$-te-re*, *pe-*]*pu$_2$-te-me-no*, and *su-ko-pu$_2$-te-e*, at least, clearly demonstrates that *pu$_2$* can represent the value /p^{h}u/[3] – and it is noticeable that the vast majority of other possible interpretations, whether plausible or speculative, likewise involve *pu$_2$* representing this aspirated value. In fact, the *only* generally accepted interpretation of a term involving *pu$_2$* representing /bu/ is *da-pu$_2$-ri-to-jo* = /daburint^{h}oyo/ 'of the labyrinth': hence the crucial status of this term, alluded to in the title of this article, for understanding the function of *pu$_2$*.

The Mycenaean 'labyrinth'

The term interpreted as 'labyrinth' is attested on three tablets at Knossos, whose texts read as follows:

KN Gg(1) 702 (Hand 103)
.1 pa-si-te-o-i / me-ri **209*^{VAS} 1
.2 da-pu$_2$-ri-to-jo, / po-ti-ni-ja 'me-ri' **209*^{VAS} 1

KN Oa 745 (-)
.1 a-ka-[ ]-jo-jo , me-ṇọ[
.2 da-pu$_2$-ṛị[-to-jo]po-ti-ni-jạ *ri*166+WE* 2̲2̲[

KN Xd 140 (Hand 124)
.1 da-pu-ri-ṭọ[
.2a pa-ze-qe , ke-wo[
.2b **47*-ta-qo[
.3 **47*-[
.4 *inf. mut.*

Although the context of **Xd 140** is unclear due to the fragmentary nature of the tablet, the others clearly record religious offerings. **Gg(1) 702** lists offerings of honey (*me-ri* /meli/) to 'all the gods' (*pa-si-te-o-i* /pansi t^{h}eoihi/) and to the 'Lady/Mistress' (*po-ti-ni-ja* /Potnia/) of the *da-pu$_2$-ri-to-jo*, and **Oa 745** lists an offering of **166+WE* (probably a type of cloth: Melena 2014, 144) to the same deity. Although the latter tablet is broken, comparison with **Gg(1) 702** makes the restoration of *da-pu$_2$-ṛị*[*-to-jo* virtually certain (it is not, however, certain whether *da-pu-ri-ṭọ*[on **Xd 140** should also be restored as the genitive; if complete, *da-pu-ri-ṭọ* could be, *e.g.*, nominative or dative-locative).

da-pu$_2$-ri-to- has been linked to classical Greek λαβύρινθος 'labyrinth' since soon after the identification of *pu$_2$* as a doublet of *pu* (L.R. Palmer 1955, 40-41), and its attestation in a clearly religious context at the site which in later myth was the home of the famous Labyrinth makes this association hard to reject (though we do not know what the Mycenaean 'Labyrinth' would actually have been – as Duhoux [2008, 263] points out, this

2 *E.g. mi-ra-ti-ja* = /Milātiai/ 'women from Miletus'?, *ki-ni-di-ja* = /Knidiai/ 'women from Knidos'?, *ra-mi-ni-ja* = /Lāmniai/ 'women from Lemnos'?, *ki-si-wi-ja* = /Kswiai/ 'women from Chios'?: see Chadwick 1988, 78-84, 91-92.

3 The argument of Witczak 1993 that this sign represents only /bu/ is based mainly on an argument relating to the undeciphered sign **22*, and will therefore be discussed below at n.31.

could, for instance, be a place-name in origin, rather than necessarily denoting a maze at this period).[4] There are, however, two difficulties with interpreting *da-pu$_2$-ri-to-* straightforwardly as the Mycenaean equivalent of λαβύρινθος: firstly, and most obviously, the fact that it begins with a *d*-series sign, which cannot denote any value other than a voiced dental /d/ (/la-/ would be represented by the sign conventionally transcribed *ra*, since the Linear B '*r*-series' in fact represents both /r/ and /l/). This is generally explained as an example of the /d/ ~ /l/ alternation seen in some loanwords in Greek, *e.g.* Ὀδυσσεύς/Ὀλυσσεύς 'Odysseus', δάφνη/λάφνη 'laurel' (see, *e.g.*, Beekes 2010, xxviii), presumably arising from the existence in one or more non-Greek languages of (a) phoneme(s) interpretable in Greek as either /d/ or /l/, and/or the transmission of these words to Greek via different routes. The same is quite plausibly true of *da-pu$_2$-ri-to-*/λαβύρινθος, whose suffix /-nt^{h}os/ is characteristic of non-Greek words (see Beekes 2010, xxxiii-iv),[5] even though there is no evidence for a synchronic alternation between /d/ and /l/ in this term (there are no examples of classical *δαβύρινθος, nor of Mycenaean **ra-pu$_2$-ri-to-*).

No secure etymology from any language has yet been established for *da-pu$_2$-ri-to-*/λαβύρινθος: the traditional comparison to the supposed Lydian word λάβρυς 'axe' (glossed by Plutarch, *Moralia* 302a) and the Carian toponym *Labraunda* (site of a temple of Zeus Labra(u)ndos, an epithet which is said by Plutarch to derive from λάβρυς; see Chantraine 1968; Beekes 2010 *s.v.* λαβύρινθος) is highly doubtful (see, *e.g.*, Yakubovich 2002, 106-108). A different hypothesis connects both *da-pu$_2$-ri-to-*/λαβύρινθος and *Labraunda* to a group of Anatolian words relating to kingship, *e.g.* Hittite *tabarna-*/*labarna-*, a royal title; Luwian *tapar-* 'to rule'; and a Lycian personal name *Dapara*/Λαπαρας (Yakubovich 2002, who reconstructs a South Anatolian verb */ðaBar-/ 'rule' as the origin of all these terms; see also Valério 2007, 3-8). A dental fricative /ð/ is certainly one possibility for a non-Greek sound which might be interpreted alternately as /d/ or /l/ in Greek (cf. the suggestion that this could have been the value of the Linear A *D*-series: Davis 2014, 204-214; see also n. 12 below). However, although an Anatolian origin for *da-pu$_2$-ri-to-*/λαβύρινθος cannot be ruled out, it is very far from being proven.[6]

An alternative is suggested by the possibility that *da-pu$_2$-ri-to-* may be related to the personal names *da-pu$_2$-ra-zo* (found on an inscribed stirrup jar originating from Crete, **EL Z 1**) and *du-pu$_2$-ra-zo* (**KN Da 1173**, **V(3) 479**.1), both of non-Greek and so plausibly of Minoan origin (Lejeune 1972b, 95-96),[7] and/or to the Linear A sequence -AB51-29-27, which is -DU-PU$_2$-RE if transliterated with the corresponding Linear B sign-values.[8] This appears two or three times as the second part of a word-sequence, apparently a compound or juxtaposition: PA-TA-DA-DU-PU$_2$-RE[(**HT Zb 160**); JA-DI-KI-TE-TE-ḌU-PU$_2$-RE[(**PK Za 15**); JA-[.]-KI-TE-TE-DU-P̣U$_2$-RE

4 The Mycenaean drawing of a labyrinth (as depicted on the front cover of this journal) suggests, tantalisingly, that some labyrinth-related story may have existed at this period – although the drawing itself is on a tablet from Pylos (**PY Cn 1287** *v.*), not Knossos. Likewise, **KN Fp(1) 1**.3 records an offering of olive oil being sent *da-da-re-jo-de* /Daidaleion-de/ 'to the sanctuary of Daidalos', but it remains unknown how this Mycenaean Daidalos related to the Daidalos of later myth.

5 Attempts to relate this term etymologically to various Greek words, including λᾶας 'stone', λαύρα 'narrow passage', or even θάπτω 'bury', are therefore unconvincing (see Chantraine 1968; Beekes 2010 *s.v.* λαβύρινθος), as is an attempt to relate it to Hebrew *deḇîr* 'inner sanctum of the Temple' (Aspesi 1996a).

6 It has also been suggested that an original /d-/, whatever its source, could have been transmitted to classical Greek as /l-/ via an Anatolian language (such as Lydian) which lacked initial /d-/ (Valério 2015, 332, n.6): although this is speculative, it shows that an Anatolian origin for the *d-*/λ- alternation need not necessarily mean that the term itself derived from an Anatolian language.

7 For the purposes of this article, although it is probable that multiple non-Greek languages existed on Crete, 'Minoan' refers only to the language of the Linear A texts (which are probably all in the same language: Duhoux 1978, 103-105; 1989, 92; Davis 2014, 179-181).

8 It is probable that, for the most part, Linear A signs had approximately similar values to their Linear B counterparts (where these exist): for discussion of this see, *e.g.*, Packard 1974; Olivier 1975; Godart 1984; Duhoux 1989, 65-71; Steele, Meißner 2017. Of course, transliterating -AB51-29-27 as -DU-PU$_2$-RE is not meant to imply that the first two syllables of this would have been phonetically identical to a (hypothetical) Linear B term **du-pu$_2$-re*. For other possible examples of alternation between Linear A -U- and Linear B *-a-*, see Valério 2007, 7-8; Davis 2014, 242-243.

(**PK Za 8**.a);[9] whatever this term's meaning,[10] note that at least two of these examples are in a religious context, appearing as part of the 'libation formula' on stone vases found in or near the Petsofas peak sanctuary (**PK Za 8** and **15**: see Davis 2014, 17-28. The purpose of **HT Zb 160**, inscribed on a pithos, is less clear). *da-pu$_2$-ra-zo*/*du-pu$_2$-ra-zo* and -DU-PU$_2$-RE have similarly been argued to relate to the Anatolian kingship words discussed above, but as shown by Valério (2015) it is not necessary to accept this in order to regard any or all of them as related to *da-pu$_2$-ri-to-*; and a Minoan origin is in any case very plausible for a term used in a religious context at Knossos. Without firmer evidence for an Anatolian (or any other) etymology, it seems safest for the moment to regard *da-pu$_2$-ri-to-* simply as a word which entered Mycenaean Greek via Minoan; while it would still be possible for Minoan to have borrowed this series of terms from elsewhere, *e.g.* Anatolia, it seems at least equally likely that they originated on Crete. The possibility mentioned above that *da-pu$_2$-ri-to-* is in origin a place-name – which, like many Cretan place-names, would be of non-Greek and perhaps specifically Minoan origin – should not be forgotten.

Although the alternation between initial *d-* and λ- is therefore not fully understood, the connection of *da-pu$_2$-ri-to-* to λαβύρινθος remains a highly plausible one, albeit perhaps not quite as secure as is often assumed. The second difficulty, however, is in the apparent equation of *-pu$_2$-* and -βυ-. From the point of view of interpreting these two terms, the simplest explanation would seem to be that *da-pu$_2$-ri-to-* = /daburint^{h}o-/, corresponding to the classical form in all respects except for the problematic initial consonant, and indeed, as stated above, this is the interpretation that is most commonly given. However, this involves assuming that *pu$_2$* can represent two different values, /p^{h}u/ and /bu/ – *i.e.* that it has a function of specifying two different phonetic features of labial stops, [+aspiration] *and* [+voicing]. Such a dual function for a single sign is completely unparalled in the rest of the Linear B script – although some core signs can represent a relatively wide range of values (such as the *p*-series representing /p/, /p^h/, or /b/), the function of the doublet signs is to offer a means of decreasing the potential ambiguity by specifying one particular feature. Thus, while the core sign *a* may in principle represent any of /a/, /ha/, /ai/, or /hai/ (since aspiration of vowels is not systematically marked, and diphthongs in *-i* are not required to be spelt out in full), the doublets *a$_2$* and *a$_3$* specify aspiration and the *-i* diphthong respectively (so that *a$_2$* could be /**h**a/ or /**h**ai/, *a$_3$* /a**i**/ or /ha**i**/: *a$_2$* does not specify as to the presence or absence of /-i/, nor *a$_3$* as to aspiration). Having a doublet sign which specified two different phonetic features in the way proposed for *pu$_2$* is not only contrary to the structure of the Linear B script as we know it, but would also be of doubtful practical use – a sign representing either /p^h/ or /b/ is not a great improvement in terms of eliminating ambiguity over one representing /p/, /p^h/, or /b/.

Two main arguments have been made which suggest that *pu$_2$* could have had such a unique status due to specific linguistic circumstances, the first within Greek, the second relating to *pu$_2$*'s Linear A equivalent, AB29 𐘩. The first hypothesis suggests that at the point of Linear B's creation, the Indo-European voiced aspirate series had not yet undergone their Greek devoicing, so that the *p*-series would have represented any of /p/, */b^h/, or /b/: *pu$_2$* would then have had the single function of specifying [+voicing], and so representing either */b^h/ or /b/, in opposition to the voiceless /p/. Once the devoicing of the aspirates occurred (*e.g.* */b^h/ > /p^h/), *pu$_2$* would have remained in use to spell terms containing original */b^h/, with the result that it would come to represent contemporary /p^h/ as well as /b/ (Melena 1987, 227-230). It is, however, clear that the devoicing of the dental aspirates occurred before the creation of Linear B, since the *t*-series, and not the *d*-series, is consistently used to represent /t^h/ (Lejeune 1972d, 30-31): for instance, *te-ke* = /t^{h}ēke/ 'he made' (~ τίθημι), *ta-ra-nu* = /t^{h}rānus/ 'footstool' (~ θρῆνυς/θρᾶνος). Since the *d*-series is the only one in Linear B which specifies voicing, there is no direct proof that the same is true of the other consonant series; Hajnal (1993, 126-127) therefore argues that the devoicing of the aspirates could have taken place as two separate developments, with */b^h/ being preserved for longer (and therefore still existing during the early stages of Linear B)

9 Texts according to *GORILA*, except that the second sign of the term on **PK Za 8**.a is given as [.], since this is variously read -NA- (*e.g. GORILA*) and -DI- (*e.g.* Valério 2007, 8-9). Two further examples which are often cited are very doubtful: A-DI-KI-TE-TE-[. .]-DA (**PK Za 11**.a-b), for which Valério 2007, 8, n.11 proposes A-DI-KI-TE-TE-[DU-PU]-RE, and DU-314-RE (**KO Za 1**.b; on the interpretation of sign 314 as PU$_3$ see, *e.g.*, Aspesi 1996b, 141; Younger *s.v.* '9. Language').

10 The suggestion that this means 'master', and JA-DI-KI-TE-TE-DU-PU$_2$-RE means 'master of Mt. Dikte' (Valério 2007), depends chiefly on accepting the connection with Anatolian */ðaBar-/; cf. Valério 2015.

than the other voiced aspirates (*/d^h/ > /t^h/, */g^h/ > /k^h/, */g^{wh}/ > /k^{wh}/). No explanation is, however, offered as to why this single sound change should have affected different consonants at such different times. A comparandum for this kind of process is offered by the changes affecting original labiovelars in Greek: these were still largely preserved in Mycenaean (and represented by the Linear B *q*-series), with the exception of those adjacent to /u/, which had already delabialized to give plain velars (*/k^w/, */k^{wh}/, */g^w/ > /k/, /k^h/, /g/: *e.g. qo-u-ko-ro* /g^woukolo-/ 'cowherd' < */g^wou-k^wol-/). The developments affecting labiovelars in other environments, which took place in the post-Mycenaean period, show varying outcomes in different classical dialects: although these generally produced labials (π, φ, β) before back vowels and consonants, and dentals (τ, θ, δ) before front vowels, Aeolic dialects often have labials even before front vowels (*e.g.* πέμπε = πέντε); the Arcado-Cypriot group have sibilants in this environment (*e.g.* Cypriot *si-se* /sis/ and σις = τις); and both Aeolic and Ionic have κ- instead of π- in certain forms, *e.g.* Thessalian κις = τις; Ionic κῶς = πῶς (see Buck 1955, 61-63; Lejeune 1972d, 43-53). By contrast, the voiced aspirates all have identical outcomes in all dialects, with no apparent differences between the process undergone by */b^h/ and by the other aspirates; it is therefore clear that this devoicing must have taken place as a single process, affecting all the voiced aspirates simultaneously, at some point prior to the creation of Linear B (cf. Thompson 2005, 112-113).

The alternative explanation (Davis 2014, 214-220) is that the Linear A sign AB29, which Davis suggests represented a Minoan bilabial fricative, had both voiced and unvoiced allophones ([β] and [ɸ]): hence, when this sign was inherited as Linear B *pu*$_2$, it acquired the ability to represent both /p^h/ (the closest Greek phoneme to [ɸ]) and /b/ (the closest to [β]: Greek speakers would have perceived the difference between these two sounds as a phonemic one). Explaining a Linear B feature by means of any reconstructed Minoan feature is, of course, methodologically problematic, but to some extent this is unavoidable: since our main potential source of knowledge of Linear A sound-values or Minoan phonology is the Linear B script itself, many of whose features must of course be due in some way to its parent script and the processes involved in adapting this to create a new script, we often have little choice but to attempt this kind of (somewhat circular) argument, in the full awareness of its potential pitfalls. For instance, the most plausible explanation for Linear B's lack of systematic distinction of the aspiration or voicing of stops, despite these being important features in Greek, is that the Linear A script lacked this distinction – although whether that is evidence for aspiration and voicing being non-phonemic in the Minoan language is another question.[11] Note also that this implies that AB29 is unlikely to have had the value /p^hu/ in Linear A. The suggestion of a value (similar to) [φ] and/or [β] for AB29 is actually an attractive one, since it would neatly explain the existence of *pu*$_2$ despite Linear B's general lack of signs specifying aspiration or voicing;[12] however, reconstructing Minoan *allophones* when little is even known for certain about this language's phonemic inventory adds an extra layer of methodological difficulty. It is entirely possible that Minoan had allophonic voicing, but there is currently no way that this can be securely reconstructed.

There is, however, a much simpler way of both interpreting *pu*$_2$ and explaining the spelling *da-pu*$_2$*-ri-to-*, namely that, in accordance with the function of other Linear B doublets and the majority of evidence for this sign's value, *pu*$_2$ represents only the voiceless aspirate value /p^hu/. Davis' suggestion of a bilabial fricative value for AB29 is perfectly compatible with this explanation – a value similar to /φ/ could easily have been reinterpreted or adapted in a Greek context as an aspirated labial stop, this being the nearest equivalent value which was phonemic in Mycenaean Greek, without necessarily needing to assume the existence of allophonic voiced and voiceless variants

11 It cannot be assumed that any particular feature of a writing system necessarily reflects a linguistic feature of the language it was used to write, even for writing systems which were specifically designed to write that particular language (and we have no way of knowing whether this was the case for Linear A and Minoan).

12 The chief exception to this, the *d*-series, is (like *pu*$_2$) an inherited feature rather than an innovation, but is unlikely to have represented a voiced dental in Linear A: suggestions for sounds which could have been interpreted as /d/ in Greek include a lateral or a dental fricative, though neither of these is unproblematic (see Lejeune 1958, 327-328; Palaima, Sikkenga 1999, 601-602; Davis 2014, 204-214; Steele 2014). Arguments for *pu*$_2$ representing /bu/ which rely on the supposed need for structural balance within the writing system, citing the existence of the *d*-series (*e.g.* Witczak 1993, 166), ignore the fact that the *d*-series is highly unusual: Linear B has no voiced velar or labiovelar series, and the Cypriot Syllabary does not distinguish voicing in *any* consonant series.

(although these remain a possibility). Other values for AB29 are of course also possible – for instance, after the devoicing of the voiced aspirates, the closest Greek equivalent to a non-Greek /b^h/ would likewise be /p^h/ (Thompson 2005); other suggestions involving various forms of secondary articulation, such as palatalisation, glottalisation, or prenasalisation, are, however, not particularly plausible ones.[13] Although in our current state of knowledge the Minoan value of AB29 cannot be certainly determined, it is possible both to identify some plausible possibilities (/φ/, /b^h/) and to explain this sign's development into Linear B *pu$_2$*: a Minoan phoneme which shared some (but probably not all) of its phonetic features with Greek /p^h/ was reinterpreted as such during the adaptation of Linear A to Linear B to produce a sign representing specifically /p^{h}u/.

It should also be noted that /b/ is likely to have been at best a fairly rare phoneme in Mycenaean Greek, if it existed at all: Proto-Indo-European */b/ is "virtually unreconstructable" (Sihler 1995, 146-147), and most classical Greek examples of /b/ originate from labiovelars before back vowels (which, as previously stated, were still preserved in Mycenaean: *e.g. qa-si-re-u* /g^{w}asileus/ ~ βασιλεύς) or from epenthesis of */(-)mRV-/ > /(-m)bRV-/ (where R = /r/ or /l/: *e.g. *m̥rtos* > βροτός 'mortal', with word-initial */mr-/ > /br-/, and **n̥-m̥rtos* > ἄμβροτος 'immortal', with intervocalic */-mr-/ > /-mbr-/: see Thompson 2005, 107-8). The latter may have taken place already in Mycenaean, but this is unclear – there are no secure examples of terms which would contain either of these sequences, although the similar epenthesis of */-nrV-/ > /-ndrV-/ is shown to have already taken place by terms such as *a-di-ri-ja-pi* /andriamp^{h}i/ < */an̥-/ (Thompson 2005, 108-109). The only suggested possible examples of *p*-series signs standing for /b/ are in personal names (*e.g. pa-pa-ro* = /Barbaros/?) or loanwords (on the common interpretation of *pa-ra-ku-* and *pa-ra-ku-ja* as /baraku-/, /barakuya/, see below; see also Hajnal 1993, 110-112; Thompson 2005, 109-111). Even a non-Greek sound which was, in terms of shared phonetic features, equally close to /p^h/ or /b/ (such as /b^h/, which shares the feature of aspiration but not of voicing with /p^h/, and that of voicing but not aspiration with /b/) would therefore be far more likely in a Mycenaean context to be interpreted as /p^h/ – whether this process of interpretation was unconscious (the 'foreign' sound may simply have been perceived as approximately the same as the familiar sound) or deliberate (the creator(s) of Linear B may have perceived the difference between the Minoan and Greek phonemes but nonetheless have chosen to use a sign based on AB29 to represent a similar sound in Greek).

Assuming, then, that *pu$_2$* represents only /p^{h}u/, how can the term *da-pu$_2$-ri-to-* be interpreted? Two alternatives are available:

1) *da-pu$_2$-ri-to-* = /dap^{h}urint^{h}o-/, *i.e.* this term was pronounced with a /p^h/ by Mycenaean Greek speakers (whatever the value of the corresponding segment in the originating language);

2) *da-pu$_2$-ri-to-* was pronounced by Mycenaean Greek speakers with its original, non-Greek pronunciation, but spelt with *pu$_2$* = /p^{h}u/ as the closest available orthographic option for representing this non-Greek sound.[14]

Ultimately, this comes down to the unanswerable question of how a Mycenaean Greek speaker would have in fact perceived and pronounced this word, but the effect is the same in orthographic terms: an original non-Greek phoneme with some phonetic features similar to /p^h/ is therefore being represented by a Linear B sign with the value /p^h/, whatever the precise intermediate stages of interpretation.

Likewise, the explanation for the different pronunciation/spelling seen in classical λαβύρινθος is the same in both cases: as is presumed to have happened with the initial *d-*/λ-, a non-Greek phoneme was differently perceived by different speakers or at different times or places. Greek alternations between voiceless and aspirated stops (or between either of these and voiced stops) in fact appear to be relatively common in words of probable non-Greek/non-Indo-European origin (for a list of alternations between voiceless, voiced, and aspirated stops in possible 'pre-

13 The suggestion of a palatalised value is based on a comparison with *ra$_2$* /rya, lya/ and *ta$_2$* /tya/ (Palmer 1955, 42), but these palatalised signs show a completely different use and distribution in Linear B; the suggestion of glottalisation is based purely on typological grounds, with no supporting Linear A or Linear B evidence (Stephens, Justeson 1978, 281); since the prenasalisation hypothesis is based primarily on an analysis of the undeciphered signs **22* and **56* (Melena 1987), this will be discussed in more detail below.

14 Note that this is not the same as saying that *pu$_2$* systematically had multiple different values, as the argument for it representing both /p^{h}u/ and /bu/ does; *any* Linear B sign could in principle stand for any number of similar non-Greek sounds in non-Greek names or loanwords.

Greek' words in classical Greek, see Furnée 1972, 115-200; cf. Jiménez Delgado 2008, 78). An alternation between classical -β- = /b/ and Mycenaean *pu*$_2$ = /p^{h}u/ in a non-Greek loanword is therefore not, in principle, especially problematic. This process of (phonemic and/or orthographic) reinterpretation of the non-Greek word underlying *da-pu*$_2$*-ri-to-*/λαβύρινθος is, evidently, a similar process to that seen in the adaptation of AB29 to *pu*$_2$: as argued above, the rarity of /b/ in the Mycenaean period could easily have led even a voiced labial of some kind (whether, *e.g.*, a fricative or an aspirated stop, and whether this voicing was phonemic or allophonic) to have been interpreted as closest to /p^h/ at this time (at least for orthographic purposes, if not also phonetically), while in the classical period the more widespread existence of the phoneme /b/ and grapheme <β> would have made this a more logical pronunciation and spelling. In addition, if the Linear A term -DU-PU$_2$-RE is related to *da-pu*$_2$*-ri-to-* (see above), then the spelling with *-pu*$_2$*-* could have been inherited from Linear A along with the word, however it was actually pronounced in Mycenaean, and both issues – the value of AB29 and the original pronunciation of *da-pu*$_2$*-ri-to-* – would be one and the same question.

Ultimately, without a decipherment of Linear A and a much fuller understanding of the Minoan language, this is not a question that can currently be answered; but complete certainty about the value of AB29 is not necessary for the purpose of understanding the value of *pu*$_2$ within Linear B. Although assuming this sign to represent only /p^{h}u/ renders the history of the (already problematic) term *da-pu*$_2$*-ri-to-*/λαβύρινθος somewhat more complicated, there are plausible explanations for this use of *pu*$_2$, as /p^{h}u/, which require far less implausible assumptions than any of those which have to be made in order to explain how *pu*$_2$ could have the value /bu/ in this single word. It is, therefore, not only unnecessary to assume that *pu*$_2$ can represent /bu/, but it is also more economical and more in accordance with what is otherwise known about the Linear B script to interpret it as standing only for /p^{h}u/.

OTHER *P^H*-SIGNS?

Regardless of the actual sound-value of AB29, there seems every reason to think that there would have been a complete series of five similar signs, with this consonantal value but different vowels, in Linear A,[15] and that these would have been similarly interpreted in Linear B as representing /p^h/. There might, therefore, be up to four further signs with this value amongst the group of currently undeciphered signs (see Table 1 above) – although of course, even if there were originally five of these signs, it is possible that not all of these were frequent enough to be attested in the Linear B tablets that we have. Even if they are attested, at least some may be sufficiently infrequent to make the chances of identifying them fairly low: with a maximum of 58 examples, *pu*$_2$ itself is not an especially frequent sign, and our ability to establish its sound-value is due to the chance attestation of several spelling alternations, in addition to the fact that this sign happens to be useful in representing a relatively common Greek root. However, it seems a reasonably strong probability that at least some of the values /p^{h}a/, /p^{h}e/, /p^{h}i/, and /p^{h}o/ are to be found amongst the undeciphered signs. The remainder of this article will therefore discuss the two signs which are most commonly suggested to belong to the same series as *pu*$_2$ (a more detailed discussion of these signs and other possible candidates for these values is given in Judson 2016).

*Sign *56* 𐀵

This sign, which, like *pu*$_2$, was inherited from Linear A (AB56 𐁅), is one of the most frequently-attested undeciphered signs (with up to 100 examples from Knossos, Khania, Pylos, Thebes, and on inscribed stirrup jars). Its

15 It is frequently assumed that Minoan had only three vocalic phonemes (/a/, /i/, and /u/), based on the absence of Linear A correspondences for some of the Linear B *e-* and *o*-signs (*e.g.* Packard 1974, 112-115; Palaima, Sikkenga 1999, 603-604; Beekes 2007, 14). However, it seems more probable that Linear A did have five series of vowels (whatever the precise relationship between these signs and the vocalic phonemes of Minoan), and that chances of attestation are responsible for the lack of some *E-* and *O*-signs from Linear A (Meißner, Steele forthcoming; see also Duhoux 1989, 72; Beekes 2010, xix-xx; Davis 2014, 240-241).

identification as having the same consonantal value as *pu*$_2$, with a value designated *pa*$_3$,[16] was first put forward by Palmer (1955) and has since been fairly widely accepted (see, *e.g.*, *Docs*^{2}, 386; Lejeune 1972b; Consani 1981; Melena 1987; Kyriakidis 2007). A more recent alternative proposal of *ko*$_2$ (Aravantinos *et al.* 1995, 829-833; Lejeune, Godart 1997; Aravantinos *et al.* 2001, 359-360) has not met with widespread acceptance (see, *e.g.*, Melena forthcoming [2000], 27-31; Palaima 2006; Kyriakidis 2007); it is worth briefly examining the reasons for this, before looking at the evidence for the value *pa*$_3$.

The suggestion that **56* = *ko*$_2$ (for which no specific phonetic value has been proposed) is based on the identification of two terms, **56-ru-we* (name in the dative) and *ko-ru(-we*) (name in the nominative/dative) as referring to the same individual at Thebes.[17] The argument in favour of this identification is that the two terms are in complementary distribution, with each spelling used by a different group of scribes: **56-ru-we* appears in texts by Hands 306, 308, and 309 (mainly as a recipient of wine in the **Gp**-series),[18] while *ko-ru(-we)* appears in Hands 304 and 305 (mainly as a recipient of grain – either barley or wheat – in the **Fq-**series).[19] Since the two terms also appear alongside some of the same other recipients (*ke-re-na-i*, *mo-ne-we*, *to-pa-po-ro-i*, and *a-ko-da-mo*/*a-ko-ro-da-mo*) they are argued to be different spellings of the same name referring to the same individual (Aravantinos *et al.* 2001, 207-208, 359). A closer examination of the contexts in which these recipients are attested, however, offers little support for this identification: *ke-re-na-i*, *mo-ne-we*, and *to-pa-po-ro-i* each appear once on the same tablet as *ko-ru(-we)* and once on the same tablet as **56-ru-we*, without necessarily giving any indication of a particularly close relationship. The link via *a-ko-da-mo*/*a-ko-ro-da-mo* depends on assuming that these two names are likewise different spellings of the same name referring to the same individual (Aravantinos *et al.* 1995, 838; 2001, 169-70), which is contextually unproven (the first appears in the **Av**- personnel series and the **Fq**-series receiving grain, the second in the **Gp**-series receving wine) and orthographically unlikely;[20] it is much more probable that *a-ko-da-mo* and *a-ko-ro-da-mo* are in fact different names (*e.g.* /Ark^{h}odāmos/ and /Akrodāmos/: García Ramón 2006, 48-50). There are therefore only three recipients securely attested as appearing on the same tablet as both **56-ru-we* and *ko-ru(-we)* – compared to at least 51 different recipients attested on the same tablet as either one of these names. Given the frequent recurrence of recipients and the very high rate of variability in the composition and ordering of groups of recipients which characterise the **Fq-** and **Gp**-series, this seems to be more of an argument for the *lack* of any especially close relationship between **56-ru-we* and *ko-ru(-we)*, rather than one in favour of identifying the two as alternate spellings (cf. Kyriakidis 2007, 218-223). Since the two scribes who write these terms repeatedly (Hands 305 and 306) have each only certainly contributed to a single tablet series (**Fq-** and **Gp-**, respectively),[21]

16 NB: this transcription is used because *pa*$_2$ was the transcription originally assigned to the sign now transcribed *qa*; using *pa*$_3$ thus avoids potential confusion.

17 Aravantinos *et al.* (2001, 392, 398) classify these as 'anthroponym or theonym'; I follow Palaima (2006) and Killen (2006) in regarding the majority of the recipients in the Thebes **Fq-** and **Gp**-series as humans rather than deities, even if (as persuasively argued by Killen) the context may well be religious.

18 **Gp 110**.[2], **112**.2, **158**.2, **164**.2, **184**.2, **345** (Hand 306); **Gp [165]**, **176**.a, **186**.[2], **188**.b (Hand 306?); ***Fq* 205**.4 (Hand 307); **Gp 119**.[2] (Hand 308); **Gp 157**.1 (Hand 309); **Gp 170**.2 (-). I exclude **Gp 114** (Hand 306) as it reads only]*ṛụ-we*. I do not regard the series attribution of ***Fq* 205**.4 (the only possible instance of this recipient appearing outside the **Gp**-series) as secure due to the lack of preserved ideograms (apart from the metrograms V and Z, which could refer to either dry or liquid commodities).

19 **Av 101**.5 (Hand 304); **Fq 117**.2, **126**.3, **214**.3, **254**.4, **284**.2, **331**.2 (Hand 305); I exclude **Fq 169**.3, **241**.3, and **309**.3 (Hand 305) from discussion as these read only]*ṛụ-we*. The ideogram used in the **Fq**-series, HORD, was originally identified as representing barley but is now regarded by some scholars as representing wheat: on this debate see Palmer 1992; 2008; Halstead 1995; Killen 2004.

20 There is no plausible reason why a name /Agorodāmos/ (the interpretation of Aravantinos *et al.* [2001]) would be spelt *a-ko-da-mo* in the majority of its attestations. Although it is possible that one of these terms could be a metathesised form of the other (*e.g. a-ko-ro-da-mo* /Akrodāmos/ ~ *a-ko-da-mo* /Akordāmos/: García Ramón 2006, 50), a sporadic process such as metathesis (on which see Thompson 2002-2003, 355-362) is hardly a secure basis for prosopographic identification.

21 **Gf 134**.2, **Gp 129**, and **Gp 144** are attributed to Hand 305?, and ***Fq* 200** to Hand 306?. However, the series attribution of **200** is insecure since neither its formatting nor its entries match other tablets in this series (cf. James 2002-2003, 399 n. 9), while the first three tablets' scribal attributions must all be extremely tentative due to the small number of signs involved.

the attested distribution of the terms **56-ru-we* and *ko-ru(-we)* seems to be simply the result of the existence of two individuals, of whom one regularly receives barley and the other wine.[22]

The proposal that **56* = *pa*$_3$ is similarly based on a spelling alternation of two terms found at Knossos, *pa-ra-ku-ja* and **56-ra-ku-ja*:[23] each of these is attested only once, as given below.

KN Ld(1) 575 (Hand 116)

.a ẹ-qẹ-si-ja
.b pa-we-a , / pa-ra-ku-ja TELA^2 30 **158* 1

KN Ld(1) 587 (Hand 116)

.1 to-sa , po-ki-ro-nu-ka TELA^2 24 re-u-ko-nu-ka TELA^2 372
.2 ko-ro-ta$_2$ TELA^2 14 **56*-ra-ku-ja TELA^x 42 po-ri-wa TELA^2 1
lat. inf. *vac.* [ ]to-ṣạ TELA 149

Both *pa-ra-ku-ja* and **56-ra-ku-ja* are clearly neuter plural adjectives describing textiles (denoted by the term *pa-we-a* = /p^{h}arweha/ ~ φᾶρος and/or the ideogram TELA); moreover, both probably refer specifically to the textiles' colour or decoration. *pa-ra-ku-ja* appears to be derived from the noun *pa-ra-ku-* (attested in the dative or instrumental singular, *pa-ra-ku-we*/ *pa-ra-ke-we*), a material recorded as decorating furniture in the **PY Ta**-series (**Ta 642**.1, **714**.1.3, **715**.3, all Hand 2). Since this is listed alongside *ku-wa-no* /kuwanos/ 'lapis lazuli' and/or 'blue glass' (~ κύανος; see Bennet 2008) and *ku-ru-so* /k^{h}rusos/ 'gold'(~ χρυσός), *pa-ra-ku-* may therefore be a precious stone or coloured glass (Hughes-Brock 2011, 102; Piquero 2015, 119-120); in either case, *pa-ra-ku-ja* most plausibly means 'of *pa-ra-ku-* colour', although 'decorated with *pa-ra-ku-* [*e.g.* in the form of beads]' is also a possibility.[24] At least three of the other adjectives found alongside **56-ra-ku-ja* on **Ld(1) 587** similarly refer to colour or decoration (see Melena 1987, 211-212): *po-ki-ro-nu-ka* = /poikil-ŏnuk^{h}a/ ('with multi-coloured *o-nu-ka*' [= threads, or decorative elements? See Bernabé, Luján 2008, 218]); *re-u-ko-nu-ka* = /leuk-ŏnuk^{h}a/ ('with white *o-nu-ka*', cf. preceding); *po-ri-wa* = /poliwa/, 'grey'; *ko-ro-ta*$_2$ probably = /k^{h}rōstia/, '(cloth) for dyeing' (Lejeune 1972a, 48). Even stronger contextual evidence is given by the relationship between the various different **Ld(1)**-series tablets, which can be broken down into two groups: a set of store records, of which **Ld(1) 575** is one, and a set of delivery records (represented by a single delivery tablet, **Ld(1) 598**, and by the totalling tablet **Ld(1) 587**: *to-sa* /to(s)sa/ = 'total'). The similarities between these sets in the number of cloths recorded and the descriptions and ratios of different types of cloth strongly suggest that they are recording the same cloth at two different stages of the administrative process (Killen, Olivier 1968, 119; Killen 1979, 151-152); the only types of cloth found on the totalling tablet **Ld(1) 587** but not in the store records are *po-ri-wa* (clearly a rare type since there is only one listed on **587**) and **56-ra-ku-ja*, whose 42 cloths are roughly comparable to the 30 *pa-ra-ku-ja* cloths on **Ld(1) 575** (Kyriakidis 2007, 225-226). Overall, there is therefore strong contextual support for identifying the **56-ra-ku-ja* and the *pa-ra-ku-ja* cloths as the same items, and the two terms as variant spellings of the same adjective.

The only potential difficulty with this alternation is that both spellings are attributed to the same scribe, Hand 116,[25] and it is unclear how common it is for a single scribe to use two different spellings of the same term.

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22 /-us/ is a common ending for men's names in Mycenaean, and there are several other disyllabic names in *-ru* in the corpus, so it is not implausible that there should be two different disyllabic names in *-ru* at Thebes (Kyriakidis 2007, 222-223).

23 Despite **56*'s relatively high frequency, this is one of only two vocabulary words in which it is found. The other, *ku-ru-su-*56* (**KN *K(1)* 740**.4) is a type of vessel but its precise interpretation remains obscure.

24 Melena 1987, 212; Barber 1991, 313, n.2; Hughes-Brock 2011, 102. The suggestion that *pa-ra-ku(-ja)* refers to cloth decorated with very fine wool (Kyriakidis 2007, 227) is based on a very uncertain reading of *pạ-ṛạ-ku* on **KN Od 667**.B, which in any case could also be interpreted as a colour term (Firth, Nosch 2002-2003, 137).

25 Although Olivier (1967, 58-60) raises the possibility that the tablets attributed to 'Hand 116' may be more than one scribe, this is apparently not certain enough to assign them formally to different hands, and even under Olivier's tentative division of these tablets, **Ld(1) 575** and **587** are both placed into the same group.

In a preliminary survey, I have found a small number of examples of a scribe alternating between a core sign and an extra one in this way – for instance, at Pylos, Hand 1 uses two different spellings of the term *o-ka-ra$_3$*/*o-ka-ra* (a plural noun referring to a group of soldiers, precise interpretation uncertain) on the same tablet (**PY An 657**.4 and .13), while Hand 2 uses two spellings, *we-a$_2$-re-jo* (**PY Ta 714**.1) and *we-a-re-ja* (**PY Ta 642**.1), for the adjective /wehaleyos, -a/ ('decorated with glass/crystal' ~ ὑάλεος). However, a definitive answer to how frequent such orthographic variation is within a single scribal hand, and therefore whether the fact that both **56-ra-ku-ja* and *pa-ra-ku-ja* are attributed to the same scribe is really problematic for this identification, awaits a systematic study of this phenomenon. Nonetheless, the identification of **56* as *pa$_3$* still appears highly probable.[26]

Although this identification does not, in principle, require a precise interpretation of **56-ra-ku-ja*/*pa-ra-ku-ja*, as long as the contextual evidence for the identification is strong enough, it would still ideally also be possible to identify this term's etymology and meaning. One interpretation in particular is frequently put forward: that *pa-ra-ku-* and **56-ra-ku-ja*/*pa-ra-ku-ja* are related to alphabetic (σ)μάραγδος, 'emerald, blue turquoise', which is itself usually compared to Akkadian *barrāqtu* and Hebrew *bāreqet* (generally derived from **brq*, 'shine' [*e.g.* Beekes 2010 *s.v.* σμάραγδος], although Piquero 2015, 118-120 suggests an alternative derivation from **wrq*, 'be green/yellow-coloured'). The term βαρακίς, glossed by Hesychius as γλαύκινον ἱμάτιον 'a blue-grey/blue-green piece of clothing', is also compared as a further possible Greek derivative of these Semitic terms (*e.g. Docs*^{2}, 340; Melena 1987). *pa-ra-ku-* is therefore interpreted as /baraku-/, the material emerald/turquoise (or blue-green coloured glass), and **56-ra-ku-ja*/*pa-ra-ku-ja* as /barakuya/, 'blue-green coloured' (or 'decorated with emerald/blue-green glass beads', see above).

This interpretation clearly depends on the assumption that *pu$_2$* and any similar signs could stand for /b-/ as well as /p^h-/; but since this has already been demonstrated to be highly unlikely in the case of *pu$_2$*, if **56* is *pa$_3$* it should similarly stand only for /p^{h}a/. Unfortunately, no good alphabetic Greek parallels beginning with φ- are available for *pa-ra-ku-* and **56-ra-ku-ja*/*pa-ra-ku-ja* – but it is entirely plausible that this is a non-Greek word, whether borrowed from Minoan, a Near Eastern Semitic language, or another source, which is unattested in alphabetic Greek.[27] The hypothesis that *pa-ra-ku-* and **56-ra-ku-ja*/*pa-ra-ku-ja* are related to σμάραγδος *et al.* cannot be used as evidence that doublets of the *p*-series could in fact stand for /b-/ as well as /p^h-/, for two main reasons. First of all, it is methodologically problematic to use the interpretation of an undeciphered sign – whose value as *pa$_3$* is probable, but not yet certain – against the evidence provided by the only deciphered sign in this series, which, as has already been demonstrated, provides no good evidence for the value /b-/: any analysis of undeciphered signs which may belong to the same series must start from the evidence of *pu$_2$*. Secondly, the posited relationship between the various alphabetic Greek and Semitic terms cited above is also problematic given the difference in initial consonants or consonant clusters: there is no Semitic equivalent to the initial σ- of σμάραγδος (which is attested earlier than the alternative form μάραγδος),[28] and in addition this involves an alternation between /m/ in (σ)μάραγδος and /b/ in Semitic, the Mycenaean terms, and βαρακίς.

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26 Various other possible alternations of **56* ~ *pa* have been proposed in support of this identification (see, *e.g.*, Palmer 1954, 67; Melena 1987, 212-218) but most involve terms which are very short, lacking in contextual evidence to link them together, and/or insecurely attested (cf. Kyriakidis 2007, 213-214). The only other reasonably good alternation is *ka-ra-*56-so* ~ *ka-ra-pa-so*, since these are both men's names at Pylos and may refer to the same individual. *ka-ra-*56-so* is a landholder on **Eo 269** *l*.s., Hand 41, and probably **En 659**.19, Hand 1; *ka-ra-pa-so* is a bronze-smith on **Jn 389**.5, Hand 2, but since there is a significant overlap between individuals appearing in the **Jn-** and **E-**series, this is therefore a possible identification (Nakassis 2013, 100-102).

27 The only proposed interpretation I am aware of which uses the value /p^{h}a/ for **56* is the suggestion that *pa-ra-ku-* is a compound /*p^{h}al-argu-/ ~ φαλός, φαλίος 'white' and ἀργός 'white; swift' or ἄργυρος 'silver' (Gallavotti 1957, 16-17). Such a compound, however, consisting of two adjectival members with very similar meanings, does not fit into normal Greek patterns of composition (on which see Meißner, Tribulato 2002, 292-301): when ἀργός appears as the second member of a compound it has a nominal first member and remains an *o*-stem rather than a *u*-stem, *e.g.* πόδαργος 'swift-footed' (Chantraine 1968 *s.v.* ἀργός).

28 *LSJ q.v.*: σμάραγδος is, for example, found in Herodotus (2.44; 3.41), while the earliest cited example of μάραγδος is Menander (fr.373). Analogical influence from σμαραγέω 'crash', as suggested by Beekes 2010, is hardly plausible on etymological grounds (cf. Chantraine 1968 *s.v.* σμάραγδος).

It has been suggested that this alternation is due to different renditions of a non-Greek prenasalised phoneme /^{m}b/, which in Greek might be interpreted as closest to either /b/ or /m/ (Melena 1987, 224-230; 2014, 71; forthcoming [2000], 8-10); as support for this hypothesis, Melena identifies possible alternations within Linear B between **56* and *ma* (Melena 1987, 209-218), as well as those with *pa* discussed above, which would imply that /^{m}b-/ was the Linear A value of AB56 (as well as of AB29 = *pu$_2$*, and any other signs in the same series). None of these possible alternations, however, approaches the level of contextual evidence for identification seen in the case of *pa-ra-ku-ja* and **56-ra-ku-ja*, or even the possible identification of *ka-ra-pa-so* and *ka-ra-*56-so* at Pylos. The best possibility, since the terms involved are at least relatively long, is *tu-ma-da-ro* ~ *tu-*56-da-ro*, but these are the names of 'shepherds' located at different places in Crete (*tu-ma-da-ro*: at *da-wo*, **KN Db 1368**.B, Hand 117; *tu-*56-da-ro*: at *e-ṛạ*, **KN Dv 1370**.b, Hand 117). There is therefore no evidence to suggest these two names refer to the same person, and the same goes for a third name cited by Melena as a possible shortened form, *tu-da-ra* (another 'shepherd', location unknown, **KN Do 924**.B, Hand 106; this spelling is suggested to result from the interpretation of /^{m}b/ as /m/, which in this shortened form is syllable-final before a following stop and therefore not written). It is far more probable that these are simply different names, and the same goes for the only other suggested alternation involving two complete terms, *a-*56-no* ~ *a-ma-no*, both names on **KN As(2) 1520** (.13 and *v*.2, Hand 105).

It is important to note that **56* provides the main evidence for the reconstruction of a Minoan phoneme /^{m}b/, since this is the only sign for which possible alternations with both *p-* and *m-* have been identified. Sign **22*, which also forms part of this argument, will be discussed below, but the statement above that hypotheses should be based on the evidence of the deciphered Linear B signs before the undeciphered ones applies equally here: there are several instances in which *pu$_2$* alternates with *pu*, as discussed above, but none in which it may alternate with *mu*. Moreover, even reconstructing a Minoan phoneme /^{m}b/ could not in itself explain the differences between the Mycenaean, alphabetic Greek, and Semitic terms discussed above: it is not inherently implausible that a Semitic word should have been borrowed into Mycenaean Greek via Minoan, but it is highly improbable that a Semitic word beginning with /b-/ should have acquired initial /^{m}b-/ on being borrowed into Minoan, and equally so that a Linear A sign representing /^{m}b-/ should have given rise to a Linear B sign representing /p^{h}-/. It is not currently possible to prove or disprove whether Minoan had prenasalised phonemes of this type; but it is possible to show that it is at best highly unlikely that AB29 = *pu$_2$* had this value, and that the same therefore applies to **56* (if this is *pa$_3$*) and to any other similar signs. The hypothesis that these signs originally represented /^{m}b-/, and that they were therefore retained in Linear B primarily to represent this unusual, non-Greek sound (cf. Palaima, Sikkenga 1999, 602-603), should therefore be rejected. These signs may, of course, have been used to represent (a) non-Greek value(s) in the many non-Greek terms in which they appear; but *pu$_2$*'s clear use in several Greek vocabulary items and names demonstrates that in Linear B its principal value was the entirely Greek one of /p^{h}u/.

To return to (σ)μάραγδος *et al.*, it is, ultimately, not impossible to overcome the difficulties in relating all of these Greek and Semitic terms, even under the assumption that *pa-ra-ku-* and **56-ra-ku-ja*/*pa-ra-ku-ja* begin with /p^{h}-/ rather than /b-/; for instance, Davis (2014, 216) suggests that, since Akkadian unemphatic stops had fricativised allophones, *barrāqtu* could have been pronounced with an initial fricative [β]; if borrowed into Mycenaean Greek via Minoan, this could have been spelt with AB56- in Linear A (if this represented a fricative, as Davis argues for AB29, see above) and this would have given rise to the Linear B spelling with **56-*. The number of (currently) unproveable assumptions involved in such an argument is, however, very large. Unless more evidence emerges, the suggested Semitic derivation of (σ)μάραγδος, βαρακίς and/or *pa-ra-ku-* etc. should be regarded as a possibility rather than a certainty; it certainly does not provide sufficient evidence to assign a phonetic value of /ba/ to **56*. If this sign is *pa$_3$* – which seems highly likely, though subject to the caveat that we have only a single relatively secure alternation, whose appearance in the same scribal hand is currently unexplained – the value which any interpretations of the terms in which it appears should therefore be based on is /p^{h}a/.

*Sign *22* 𐄁

Like **56*, **22* was inherited from Linear A (AB22 𐄁), and is relatively frequently attested in Linear B (up to 74 examples, not counting instances of the morphologically identical ideogram CAP 'goat'), although it is found in its syllabographic use only at Knossos, Thebes, and on Cretan inscribed stirrup jars (the ideogram is also found at Pylos). Some evidence as to this sign's possible value is provided by its distribution, as it very frequently appears adjacent to *-i* or *j-* (Palmer 1963, 22-23). The list below gives all the different terms in which **22* is certainly or probably attested (excluding very dubious and/or isolated examples): these are mostly personal names, apart from the toponym *da-*22-to* and the associated adjective *da-*22-ti-jo/ja*.

Preceding *-j-:*
*ko-du-*22-je* (**TH Fq**-series, *passim*)
22-ja-ro* (KN Xf 4486**)
]**22-je-ṃị*[(**KN Xf 8835**)
]-**22-jo* (**KN Xd 7808**)

Following *-i-*:
]*a-di-*22-sa* (**KN F(2) 841**.2)
*ta-di-*22-so* (**KN De 5032**.B)

Preceding *-Ci*:
*o-*22-di* (**KN As(2) 1520**.11)
22-ri-ta-ro* (KN Dv 1216**.B)
*da-*22-ti-jo/ja* (**KN**, *passim*)

Other/unknown:
*da-*22-to* (**KN**, *passim*)
*ta-*22-de-so* (**TH Z [870]**, **871**, **[872]**, **876**; **KH Z [5]**, **[39]**)
]**22* (**KN Da 2027**)
22-ḳạ-ne* (TH Uq 434**.10)

22* therefore either precedes *-j-* or appears in a syllable adjacent to one in *-i* in c.70-75% of the different terms in which it appears, which is a reasonably strong indication that its vocalic value may be *-i*. *j*-series signs frequently follow this vowel, since they are used to write the glide arising between /i/ and a following vowel; the significance of the sign's frequency adjacent to *-Ci-* is due to the practice of writing consonant clusters using 'dummy vowels', which, in a script whose signs all represent open syllables, have to be used in order to indicate the first consonant in a cluster. Since dummy vowels are generally the same as the actual vowel contained in the relevant syllable (*e.g.* /tri-/ is spelt *ti-ri-*), a sign frequently attested immediately following or preceding a sign in *-i* may well be involved in writing clusters of this type. In addition, *ko-du-*22-je* – likely, from its context as a recipient of grain in the **TH Fq-series, to be a dative – is quite plausibly formed from an *i*-stem **ko-du-*22* (cf. *ma-di-je*, *i*-stem dative on **TH Av 101**.5, whose nominative *ma-di* is found on **KN As 603**.2 and **Db 1168**.B: Killen 1999, 217; Aravantinos *et al.* 2001, 359). Two caveats are important at this point: firstly, that this is a fairly small sample of terms, so that we cannot be sure how significant these numbers are; and secondly, that of course we do not know whether terms such as **22-ri-ta-ro* or *ta-di-*22-so* do in fact contain consonant clusters (and one of the examples given above, *da-*22-ti-jo/ja*, certainly does not, since in the toponym *da-*22-to* this sign is followed by a different vowel). Nonetheless, a value in *-i* seems a reasonably probable one, and has generally been assumed by most decipherment proposals for this sign.

The most frequently cited example of a spelling alternation which might enable this sign's consonantal value to be identified involves the names *ta-*22-de-so* and *ta-mi-de-so*.[29] The first is found on a series of Cretan inscribed stirrup jars (as listed above), and therefore refers to the producer of either the jars or their contents (another jar, **TH Z 869**, features the name *ta-de-so*, very probably referring to the same person; the different spelling is likely to be due to a simple omission of a sign);[30] *ta-mi-de-so* is a 'shepherd' located at *e-ra* on **KN Dl(1) 944**.B. However, not only is there no contextual evidence to link *ta-*22-de-so*/*ta-de-so* and *ta-mi-de-so*, but the fact that they are attested in such completely different contexts and locations (the jars all originate from West Crete: see Haskell *et al.* 2011, 92-99) means that this is extremely unlikely to be the case: the two could still be the same name, but without any proof of identification this is an extremely insecure basis for an argument. In addition, the obvious value to suggest on the basis of this supposed alternation, mi_2 (*e.g.* Sittig 1954, 68; Landau 1958, 13; Palmer 1963, 22-23; Janda 1986) would have no specific phonetic value to justify its existence: unlike the core series representing stops, the *m*-series represents only /m-/, and a doublet of this would therefore not be necessary.

The equation of *ta-*22-de-so* with *ta-mi-de-so* and *ta-de-so* has, however, also been used by Melena to support his argument, discussed above under sign **56*, that pu_2 and related signs originated in a Minoan pre-nasalised phoneme /^{m}b/:[31] these are cited as fluctuating spellings of non-Greek /^{m}b/ with signs representing /b/ or /m/, as well as with a shortened form *ta-de-so* (cf. above on *tu-da-ra*), but an alternation of **22* with *p-* to give the value pi_2 is noticeably lacking. Since, as has already been shown above, there is no other secure evidence for this hypothesis, a possible alternation of **22* with *mi*, in terms which are more probably different names, does not offer any support for this sign having the value pi_2. That is not to say that **22* is certainly not pi_2: this remains a highly plausible value for an inherited sign with a probable vocalic value of *-i*. However, other values are also possible – for instance, *zi* (to fill one of the few gaps in the core syllabary), or *nwi* (cf. the inherited sign *nwa*) – and in the absence of any secure spelling alternations or identifiable Greek terms containing this sign, it is not possible to prove which (if any) of these is in fact its value. **22* may well have the value pi_2 (= /p^{h}i/), but it cannot currently be shown to do so.

Other signs

Various other undeciphered signs have been suggested to have similar values such as pe_2 and po_2: for instance, the value po_2 is suggested (but rejected) for **18* by Melena (forthcoming [2000], 4) and for **49* by Owens (1991-1993, 265); **49* has also been suggested to be pe_2 (Melena forthcoming [2000], 25-26), as has **83* (Witczak 2002-2003, 125-126). However, no convincing evidence exists to demonstrate that any of these signs has one of these values, since they are all relatively infrequent and do not appear in any identifiable Greek words or secure spelling alternations. In principle, therefore, the values pe_2, po_2, and perhaps pi_2 remain possibilities for almost any undeciphered sign inherited from Linear A – as the majority of them probably were (only **63*, **64*, and **83* have no plausible Linear A equivalents at all).[32]

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29 Other proposed alternations involving this sign (Janda 1986, 46; Melena 1987, 223) are all insecure due to the terms' short length.

30 The palaeography of the *ta-*22-de-so*/*ta-de-so* inscriptions, particularly the unique form of *de*, implies that these inscriptions were all produced by the same painter or workshop, and therefore also refer to the same person; see Judson 2013, 76, 97-98. *ta-de-so* also appears several times at Knossos: **As(1) 604**.2: at *ra-su-to;* **De 1409**.B: 'shepherd' at *e-ko-so*; **Df 1285**.B: 'shepherd' at *ru-ki-to*; **V(3) 655**.3: at *ja-po*; **X 7758**: no context. It is uncertain whether any or all of these names may refer to the same individual (Landenius Enegren 2008, 86-87), but given that four different locations are mentioned, it seems most likely that these refer to more than one person, though not necessarily as many as four or five different people.

31 The argument that **22* = /bi/, and that therefore this whole series of signs stands only for /b-/ (Witczak 1993), is based chiefly on the assumption that this series should be parallel to the *d*-series (on which see n. 12 above) and on a derivation of **22* = /bi/ acrophonically from βίσων (which means 'bison', not 'goat', and is Germanic in origin, probably borrowed into Greek via Latin: Chantraine 1968; Beekes 2010 *q.v.*). This is not only highly doubtful as an origin of this sign, but also violates the principle outlined above that arguments of this type should be based primarily on the evidence provided by deciphered Linear B signs.

32 Further discussion of which signs might be the most likely candidates for these values is beyond the scope of this article; see further Judson 2016.

CONCLUSIONS

This article has demonstrated that, contrary to what is usually assumed, the Linear B doublet sign *pu*$_2$ does not represent the two different sound-values /p^{h}u/ and /bu/. Even this sign's appearance in the term *da-pu*$_2$*-ri-to-*, corresponding to classical Greek λαβύρινθος 'labyrinth', is better interpreted as /dap^{h}urint^{h}o-/ than /daburint^{h}o-/: whatever this word's origin (which remains unclear), it is far simpler to account for an alternation between Mycenaean /p^h/ and classical /b/ in a non-Greek word than it is to explain how *pu*$_2$ could have acquired two distinct sound-values. In the absence of a convincing explanation for this, the interpretation which is more in accordance with the general structure of the Linear B script and the less problematic attestations of *pu*$_2$ should be preferred, and *pu*$_2$ is therefore concluded to represent only /p^{h}u/.

This conclusion does not merely affect the interpretation of *da-pu*$_2$*-ri-to-*, but has further-reaching implications for the status of other signs in the same series as *pu*$_2$. The existence of up to four more such signs amongst the undeciphered signs is highly likely, very probably including **56* as *pa*$_3$ (and perhaps **22* as *pi*$_2$, though other values remain equally possible for this sign), and these signs should similarly stand for /p^h-/ rather than /b-/ – meaning that, for instance, the widely-accepted interpretation of the adjective **56-ra-ku-ja*/*pa-ra-ku-ja* as related to (σ)μάραγδος, *barrāqtu*, *et al.* is considerably more problematic than is usually assumed, as is the reconstruction of a Minoan phoneme /^{m}b/ on this basis.

More important than the interpretation of any single sign, however, is the methodological point raised by this discussion of the *p^h*-series, namely that discussion of any aspect of Linear B which is not yet fully understood – and particularly attempts to assign sound-values to any of the undeciphered signs – should be based first of all on a thorough analysis of what *is* already known about the script. The best chance of being able to fully decipher signs such as **56* and **22* – or to use features of the Linear B script to reconstruct aspects of Linear A and the Minoan language – lies in a detailed understanding of the functions, use, and development of deciphered signs such as *pu*$_2$.

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Abbreviations

CoMIK Chadwick J., Godart L., Killen J.T., Olivier J.-P., Sacconi A., Sakellarakis I.A. 1986-1998, *Corpus of Mycenaean Inscriptions from Knossos* I-IV (IG 88), Cambridge-Roma.

DMic Aura Jorro F. 1985-1993, *Diccionario micénico* I-II, Madrid.

Docs^2 Ventris M.G.F., Chadwick J. 1973, *Documents in Mycenaean Greek*, Cambridge.

GORILA Godart L., Olivier J.-P. 1976-1985, *Recueil des inscriptions en linéaire A* (ÉtCrét 21), Paris.

KT^5 Killen J.T., Olivier J.-P. 1989, *The Knossos Tablets* (Minos Suppl. 11), Salamanca.

LSJ Liddell H.G., Scott R., Jones H.S., McKenzie R., Glare P.G.W., Thompson A.A. 1996, *A Greek-English Lexicon*, Oxford.

PoN IV Bennett E.L., Melena J.L., Olivier J.-P., Palaima T.G., Palmer R. 2013 [unpublished], *The Palace of Nestor at Pylos in Western Messenia* IV*: The Inscribed Documents,* www.academia.edu/5788888/.

PTT Bennett E.L., Olivier J.-P. 1973, *The Pylos Tablets Transcribed* I-II (IG 51 & 59), Roma.

TITHEMY Melena J.L., Olivier J.-P. 1991, *TITHEMY: the Tablets and Nodules in Linear B from Tiryns, Thebes and Mycenae: a Revised Transliteration* (Minos Suppl. 12), Salamanca.

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Anna P. Judson
Gonville & Caius College
Cambridge CB2 1TA
U.K.
apj31@cam.ac.uk