



Linear A *301

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Abstract

The Linear A sign *301 appears about a hundred times in Minoan inscriptions, but unlike other signs with a low frequency, such as e.g. ME and PU, no similar syllable is known from Linear B. Therefore, the meaning of the symbol must be guessed from the Linear A context. Combination of the information from two occurrences suggests the value DY0=DYAU and this value is tested against the remaining context provided by the Linear A corpus.

Introduction

In the past century, various authors reported evidence for a link between the Harappan and Vedic civilizations of the Indus Valley and the Minoan culture of Crete (L.C. Fabri 1935; H. Mode 1944; S. Alexiou; R. Kamm 1967). In 1999, V. Sarianidi provided a plausible explanation for these observations by reconstructing a migration route of Near Eastern Aryans into the Indian subcontinent. The present authors noted that Sarianidi's theory implies the possibility that the Minoan language is close to Vedic and they tested this hypothesis on the two best documented Linear A words of the Minoan language: KU-LO and PO-TO. It was found that both words are indeed meaningful and grammatically correct Vedic in their Minoan context. Subsequent analysis of the Minoan libation formulas (van den Kerkhof and Rem) suggested that the sign *301, for which no similar sign is known from Linear B, may end on -U.

Sign *301

Linear A has several dozens of symbols that cannot be linked to any sign of Linear B, and so the values of these symbols must be guessed by other means. Fortunately, many of these symbols are rare. Not so sign *301 (Figure 1). In a recent count, it was found in 15 libation formulas, on 16 clay tablets, about 50 seals and 14 roundels, and on a few other inscribed objects: about a hundred times in total. The fact that *301 often appears between syllable signs, and in widely varying contexts, suggest that it represents a syllable in at least part of the cases. On the other hand, the use of *301 as an isolated sign on seals and tablets shows that it was also used as an ideogram, and possibly a religious one, since the scenes on Minoan seals are often associated with religion.

A first clue to the value of *301 as a syllable comes from a comparison of three, almost identical parts of libation formulas:

(PS Za 2) TA-NA-I-*301-TI

(IO Za 6) TA-NA-I-*301-U-TI-NU

(IO Za 2) TA-NA-RA-TE-U-TI-NU



Figure 1: The Linear A sign *301.

Comparison of the first two fragments with the third one, TA-NA-RA-TE-U-TI-NU, shows that TA-NA and U-TI-NU are separate words. It follows then that (IO Za 6) has a word I-*301 in the middle. Yet this creates a problem with (PS Za 2), since TI is not a word. One may conjecture that TI is a suffix and I-*301-TI should be read as a single word, most likely then a derivative of I-*301 found in (IO Za 6). However, another intriguing possibility is that *301 ends on –U, in which case –TI should be read as U-TI. The explanation then is that the writer of (IO Za 6) chose to repeat the U for the start of the next word U-TI-NU, while the writer of (PS Za 2) combined the final –U of *301 with the initial U- of U-TI. The latter possibility leads to a straightforward and consistent interpretation of all three fragments in Vedic (Vedic *ūti* is very likely at the basis of, and synonymous with, Minoan *ūtīnu*).

If indeed *301 ends on –U, then some of its inflections would show endings on –WA, –WE, –WI or the like. Such forms are in fact found in the Minoan corpus. For example:

(PK Za 11) ?-TA-I-*301-WA-E

(TL Za 1) A-TA-I-*301-WA-JA

The conjecture that *301 ends on –U is therefore taken as the starting point for the present analysis.

Vedic distinguishes between stems ending on –*u*, on –*ū* and on –*au* or –*āu*. In order to see the implications of this, the table below gives some inflections of such stems:

Stem	vāyu	bhū	gau
Dat. sing.	vāyave	bhuve, bhuvāi	gave
Nom. plur.	vāyavas	bhuvas	gāvas
Derivative	vāyavya	bhavya	gavya

If we write *301 as XU (X being the unknown part of the syllable), the form found in (TL Za 1) becomes XU-WA-JA, which is not compatible with the regular inflection of Vedic u-stems, which would give XA-WA-JA. The search therefore narrows down to syllables of the form XŪ, XAU or XĀU. Since we also expect *301 to be monosyllabic, this observation leaves less than two dozen candidates of stems that are found in the Rig Veda. Most of these can be dismissed safely because they raise at least two of the following three objections:

- There is another Linear A syllable that can express this value (assuming of course that the Linear A values agree with the values of similar Linear B syllables);
- The meaning of the stem is incompatible with its frequent use as an ideogram on a Minoan seal;
- The meaning of the stem seems a priori unlikely to be used in the opening line of libation formulas.

The remaining options are *dū* (gift), *bhū* (world), *nāu* (ship), *gau* (cow), *dyau* (heaven, *dyāvā* meaning heaven and earth) and, less likely, *çū* (grow strong) and *stu* (praise). Considering that I-*301 (with or without the final –U) in (IO Za 6) must be a Minoan noun or adjective, only three possibilities are left:

*301	A-TA-I-*301-WA-JA (TL Za 1)	TA-NA-I-*301-U-TI-NU (IO Za 6)
dû	ātai duva-?	tanā id? Utinu
dyau	ātai dyāvā-yâ	tanā īdyā ūtinu
nāu	ātai nāvya	tanā inā ūtinu

Although the –WA-JA ending of (TL Za 1) may be interpreted in different ways (from *deva* is made *devya*: divine power; *deva-yâ*: going to the gods; *deva-jâ*: born of the gods), it is difficult to see how the stems *dû* and *nāu* can fit into the opening line of the libation formulas. The stem *dyau* fits nicely, however. Dyau is an important Indo-European god and therefore his ideogram does not come unexpected (the European Tiu has his own ideogram, †, and so has Jupiter). The presence of an ideogram of Dyau on the seals of officials dealing with law or religion is also quite logical. Finally, the stem fits well to (TL Za 1): *at the gate is the one going to heaven and earth* (cf. Od. XII, 381) and to (IO Za 6): *everlasting, praiseworthy libation* (noting that Vedic *īdya* is used as an adjective for divinities, libations and water).

Tests of the DYAU conjecture

Successive elimination of options is a procedure that is prone to errors and therefore the conjecture that *301=DYAU should be tested against independent evidence. A relatively objective test is to compare the statistics of *301 and *dyau* in Vedic and Minoan texts. The most straightforward procedure is to compare directly the frequency of *301 in Minoan texts with the frequency of *dyau* (*dyo*) in the Rig Veda. Since Minoan will write *dyo* where Vedic writes *dya(s)*, *dyo*, or *dyāu*, and the latter syllables occur about 600 times among the 400,000 syllables of the Rig Veda, the frequency of a DYAU-syllable in a sufficiently large Minoan text, if it exists, should be about 1.5 ‰. This estimate has still to be corrected for the fact that Linear A has significantly fewer syllables than the *devanāgarī* script: the 500 most frequent syllables of the *devanāgarī* script account for 95% of the text of the Rig Veda, whereas less than 60 of the most frequent Linear A syllables account for 95% of the Minoan Linear A corpus. A Minoan writer faced with a complex syllable that is available in the *devanāgarī* script but not in Linear A has the options of either approximating the syllable by simpler ones, or of rephrasing the message. Either choice has the effect to increase the frequency of the Linear A syllables above the frequency of their counterparts in the *devanāgarī* script. The maximum likely increase in frequency for the DYAU syllable is estimated at 60%, since DYAU can be used to write *dyā* in some cases, as for example in (TL Za 1), and *dyā* occurs about 400 times in the Rig Veda. The test is therefore whether Linear A *301 has a frequency of 1.5-2.5 ‰.

The three bodies of regular Minoan text, i.e., the regular text on administrative tablets, the libation formulas, and the inscriptions on objects, give estimated frequencies for *301 in Linear A of 3 ± 1 ‰, 34 ± 9 ‰ and 5 ± 4 ‰, respectively. The large statistical errors reflect the limited size of the Minoan corpus and this is also the reason why the result for the relatively large body of administrative texts is statistically the most significant. Remarkably, the conjecture *301=DYAU passes this most critical test. The result for the libation formulas is an outlier, and it is not difficult to see why it is not representative for the Minoan language as a whole: the reason is that the libation formulas repeat some very popular text elements and one of these happens to contain *301. The conjecture also passes the test of the inscriptions but this result has little statistical significance compared to the test of the administrative texts. A second, less objective test, is to select from the Linear A corpus words that contain the syllable *301 and check whether such words with *301 replaced by *dyau* are known to Vedic. Since it is difficult, in general, to recognize word boundaries in Linear A without interpreting the meaning of the text, a more feasible alternative is to consider only combinations X-*301,

where X is a single syllable starting a Linear A term and check whether this combination occurs in the Rig Veda. The known combinations of this type are:

X	*301=DYAU	*301=ME	*301=PU
A	adyas, adya	amena	apupa
I	idya	im	-
DI	didyo	-	-
SA	sadyas	sam	-
ZU	?	?	?

In order to get a feeling for the significance of this test, the results are compared with the results that would be obtained if *301 would be replaced by two randomly chosen syllables with about the same frequency as *301 in regular text. Obviously, the prefix A- is so abundant that it combines with virtually any syllable to form the start of a Vedic word. On the other hand, words starting with DI- are relatively rare and so the combination DI-*301 provides a critical test. Of course, DYAU satisfies this test because DI- is the reduplication prefix of DYAU.

A final, most critical but also subjective test is to check how *301=DYAU fits the context of the Linear A documents in which it occurs. Since the conjecture was derived on the basis of its occurrence in libation formulas, we will focus on the tablets and inscriptions on objects.

Administrative records

The administrative records on tablets provide four occurrences of *301 in completely surviving terms:

(**ARKH 2**) ZU-*301-SE-DE-QIf-*118
 (**ZA 11**) SA-*301-RI
 (**HT 8, HT 98**) PARO-*301

The first two cases seem to be ordinary records of wine, wheat and olives that do not provide a useful context. A further problem with the first record is that it is not clear how ZU should be rendered into a Vedic syllable. It is also not clear whether the term contains words or names or both. Concerning the second record, on the heavily damaged tablet ZA 11, the word SA-*301-RI may be part of the title and so it probably is a word. If we read *dyo* for *301, we get *sadyo-ri* (quickly release), comparable to the Vedic construction *sadyo-jū*. Again, there is insufficient context to test this interpretation.

The tablets HT 8 and HT 98 can be interpreted into Vedic if the sign preceding *301 is read as a ligature of PA and RO. The result, *paro-dyau*, means *distant heaven*. Vedic *para* and its superlative *parama* are used to refer to heaven in this way in the Rig Veda. It would seem then that HT 8 and HT 98 record oil and possibly wine used in religious ceremonies. This conjecture is confirmed by the some of the other entries on the two tablets:

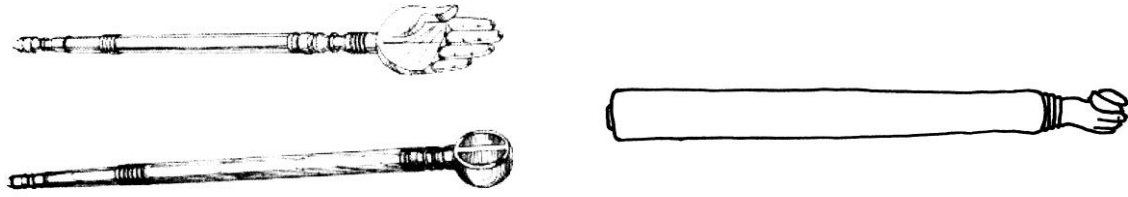


Figure 2: Examples of the *sruc* used in modern Hindu sacrifices (left, Rivault and Sordon 2004) and a Cypro-Minoan arm-shaped votive implement, with the hand grasping the cup (right, Buchholz and Karageorghis 1973). Note also the description of the Vedic *sruc* (H. Grassmann, *Wörterbuch zum Rig-Veda: armslang mit handgrossem Kopfe*).

JE-DI		HT 8	TA-NA-TI	HT 98
PA ₃ -KA-RA-TI	Bhaga-Rati	HT 8	DI-RE-DI-NA	HT 98
QA-*310-I		HT 8	RO-KE	Roka HT 98
SI-KI-RA		HT 8	KA-RI-*310-I	HT 98
KI-RE-TA-NA	Kīrtana	HT 8		
SU-PU2-*188		HT 8		
PA ₃ -*188		HT 8		
KA-PA	Kappa?	HT 8		
PA-JA-RE		HT 8		

KI-RE-TA-NA (*kīrtana*: praising) is still an important religious celebration in today's Hindu communities (Ph. Rivault and L. Sordon 2004, p.10). PA₃-KA-RA-TI may be Bhaga-Rati, divinities of luck and sexual desire, also occurring in this combination in the Rig Veda. It is tempting to read the crescent-shaped *310 sign (see Figure 2) as *moon (candra)*. This admittedly speculative interpretation would turn two of the terms into *gva-candrai* (at coming moon) and *cari-candrai* (at changing/wandering moon: another surviving Hindu ritual). Strange though it might seem that the names of ceremonies remain unaltered for such long times, it is clear from the archaeological record that some of the paraphernalia of the Minoan rituals are also still in use in modern Hindu rites with very much the same details (Figure 2).

Inscriptions on objects

The sign *301 appears in two inscriptions: one on a gold ring from Knossos and the other on a large pithos from Zakros. Consani reads the inscription on the gold ring as:

(KN Zf 13) A-RE-NE-SI / DI-*301-PI-KE / PA-JA-TA-RI-SE / TE-RI-MU / A-JA-KU

Setting *301=DYAU, the term DI-*301-PI-KE can be either a nom. or a voc. of *didyo-piç* (*didyo*: shining, intensive of *dyo*; *piç*: ornament, decoration):

didyo-pik shining piece of jewellery

(cf. *çukra-piç çrīs*: a bright-coloured decoration, RV X 110,6). The first term A-RE-NE-SI seems to be related to the Vedic *ar* (set into motion, excite, cast), which has the target object in the locative or accusative (*arnvāsi*: may you excite). Then PA-JA is its object (*pājas*: shimmering light). TA-RI-SE could be the locative to *ar* (*tarisa*: a beautiful shape). A tentative translation of this line is then:

May you excite, shining piece, a shimmering light onto a beautiful shape ...?

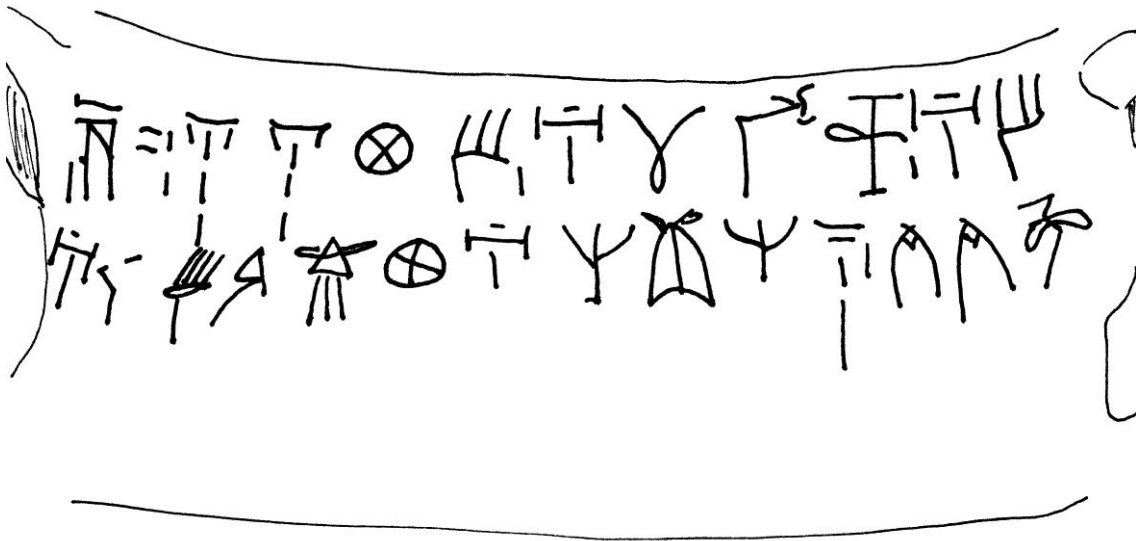


Figure 3: Inscription on the Large Pithos from Kato Zakro (N. Platanos 1975).

Notwithstanding the uncertainties of Consani's reading, and therefore also of the above interpretation, the important conclusion is that the term DI-DYO-PI-KE is consistent with the nature of the inscribed object, being a piece of jewellery.

The inscription (ZA Zb 3) on the Zakros pithos (Figure 3) is read differently by various authors:

A-TA-I-*301-DE-KA A-RE-PI-RE-NA TI-TI-KU (Consani 1999, Brice 1975)

A-PO-I-*301-DE-KA A-RE-PI-RE-NA TI-TI-KU (Platanos 1975)

From the Vedic perspective, only the transcription by N. Platanos makes sense. In fact, the transcriptions by Brice and Consani seem to be inspired by a superficial resemblance of (ZA Zb 3) with some libation formulas, and, as Chadwick (1987) already observed, there is actually no reason to expect a libation formula on this object. A Vedic interpretation of the line is:

Âpo îdyā udakā ariprena titikṣūs Praiseworthy waters, may you remain with a stainless flood

The combination Âpo îdyās, the result of the interpretation *301=DYAU, does not come unexpected since RV X 30,8 has ...ūrmim ... îdyam, ... āpo.... A close parallel of the entire line is Rig Veda VII 67,1: Âpo ... ūrmim ... a-ripram ... vanema: Waters, may we receive your stainless flood. Note that *ariprena* has the regular instrumentalis ending *-ena* of nouns on -a, whereas *udakā* has the normal instrumentalis ending *-ā* that is known for nouns on -a from the older Vedic texts (Whitney 1924, p.112).

Conclusion

The use of the Linear A sign *301 in the Minoan libation formulas suggests DYAU as the only possible value. This conjecture is confirmed by a comparison of the statistics of Vedic *dyau* and Minoan *301 and by the context of *301 in the remaining Minoan corpus.

The frequent use of *301 on seals documents the importance of Dyau in Minoan religion. This brings into mind the strong presence of the Minoan culture in 14th century Egypt and Littmann's theory concerning the Indo-European origin of Yahweh (as also the strange parallels of the legends of Minos and Moses).

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