

## Multiple Sequence Alignment of Libation Formulae suggest Linear A is Mycenaean Greek

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### **Abstract**

Here, we align multiple texts of various Libation formulae in Linear A. The alignment delineates words, and highlights synonymous syllables, of the Libation formulae. Remarkably, two vessels and their contents are specified and verify the proto-Greek origin of Linear A. The two vessels are: (1) “receptacle of grain” SU-TE-DA-KE (σιτοδόκος) followed by its content “grains” SE-TO-I-JA (σιτος,-οο) and (2) “receptacle of oil” I-RAI-DE-KA (ελαιοδόκος) followed by its content “olive oil” A-RE-PI (ἄλειφαρ, oil) RE-NA (ἔλαιον, olive). We hypothesize that \*301 is pronounced RAI, and translate I-RAI-WA-E (ἐλαιόω) into “olive-oil”, and I-RAI-TI (ἀλείατα) into “wheat-meal”, both common in libation.

Furthermore, the multiple sequence alignment juxtaposes the Goddess, I-DA-A (θεά) and I-DA-MI (δαίμων) with JA-SA-SA-RA-ME, the Ashera poles (אשרים) and with JA-SA-RA-A-NA-NE, a luxuriant tree (רענן). Potentially, the alignment enables the decipherment of logogram \*321, shaped like a labrys, with the phonogram JA-SA-SA-RA-ME. In turn, the labrys inscription I-DA-MA-TE could refer to the God mother (θεά μήτηρ), Demeter (Δημήτηρ).

Finally, we hypothesize that KA-NA-SI is derived from the noun “empty” (κενός), and the verb “to pour” (Εγκανασσειν). Interestingly, KA-NA-SI is aligned with the proto-Semitic synonymous translation “I emptied” RU-KA-NA-TI (רוקנתי) and RU-KA-JA-SI (ריקיתי).

As such, we conclude Minoan is mainly a proto-Greek language, yet permeated with proto-Semitic influence.

### **Introduction**

Linear A was used to write the Minoan language spoken in Crete from approximately 1800 to 1450 BCE. Linear A has never been fully deciphered, except for numerals, and ideograms (see appendix). Despite several attempts to decipher Linear A, the Minoan language remains undeciphered to this date.

Linear B however, was deciphered by Michael Ventris and John Chadwick<sup>1</sup>. Linear B is a syllabic script and was used to write Mycenaean Greek, an early form of Greek. Presumably, Linear B evolved from Linear A, and they are likely to share related syllabaries.

Several decipherments of Linear A have been attempted. Notably, the blogger Brian Colless<sup>2</sup> has developed the notion of proto-Semitic origin, based on scholars such as Cyrus Gordon. These attempts, however lack validation beyond any reasonable doubt, and do not rely on substantiating evidence like the “Rosetta” stone famously used by Champollion to decipher the Egyptian hieroglyphs. In addition, earlier attempts have not been founded on side-by-side

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<sup>1</sup> Ventris, Michael, Chadwick, John (1953). "Evidence for Greek Dialect in the Mycenaean Archives". The Journal of Hellenic Studies. 73: 84–103.

<sup>2</sup> <http://cryptcracker.blogspot.com/2016/09/semitic-crete.html>

juxtaposition of ideograms and phonograms - “□” and “TI-RI-PO” (τρίπος) for tripod – notably used by Ventris and Chadwick to decipher Linear B.

In this study, we apply multiple sequence alignment, a tool often used in bioinformatics, to align the known libation formulae in Linear A. The alignment highlights synonymous inscriptions, and delineates individual words. Remarkably, Linear A and B share identical spelling of some words, such as “oil” A-RE-PI (αλειφαρ), and “olive” RE-NA (ἔλαιον). In addition, Linear A and B use different spellings for other words, such as “olive-oil” (ἐλαιόω), spelled I-RAI-WA and E-RA-WA respectively. Finally, the proximity of receptacles and their content also attest to our decipherment. For example, the “receptive of oil” I-RAI-DE-KA (ελαιοδόκος), precedes the content “olive oil” A-RE-PI RE-NA (αλειφαρ ἔλαιον). Likewise, the “receptive of grain” SU-TE-DA-KE (σιτοδόκος) precedes the content “of grains” SE-TO-I-JA (σιτος,-oo +JA plural suffix). As such, Minoan is mostly a proto-Greek language with some proto-Semitic influence.

## Methodology

*Sources.* All Linear A texts described in this article were downloaded from the website of John Younger (<http://www.people.ku.edu/~jyounger/LinearA/>). The transcribed texts are based on the texts presented in Recueil des inscriptions en Linéaire A (GORILA) by Jean-Pierre Olivier and Louis Godart. The Linear A text version used herein were downloaded throughout the Covid-19 pandemic, and correspond to the texts available between March 2020 and April 2021.

*Multiple sequence alignment.* To align multiple Libation formulae, the following transcriptions were used: IO Za 2, TL Za 1, IO Za 6, IO Za 8, PK Za 12, PK Za 11, KO Za 1, PK Za 8, SY Za 1, PK Za 18, PL Zf 1, PR Za 1, KN Za 10, SY Za 3, IO Za 9, PS Za 2.2, IO Za 7, AP Za 1, KN Zc 7, PK Za 15, AP Za 2, VRY Za 1, SY Za 4, SY Za 2, and ZA Zb 3. The alignment was performed manually based on the multiplicity of text is expected to facilitate sequence alignment. In turn, multiple sequence alignment delineates words and highlights synonyms.

## Results

The Libation Formulae appear on various inscribed objects, many dedicated at sanctuaries. The formulae follow a fairly strict sequence with some changes. Shown in Table 1, is the multiple sequence alignment of the Libation formulae (and their translation).

**Table 1.** Multiple sequence alignment of Linear A libation formulae.

		τα/τινά	ἔλαιω	δοχή	ταῦτο	ἔε	πυρός	εἰς	πῶς	ov	κενός	ἐνινώ	σιποτόν	
		The/A	olive oil	receptacle	this	and	wheat	unto	asherim pole	which	I	empty	upon	the silo
VRY Za 1	Serpentine square LT*													
SY Za 3	Serpentine round LT*	A-TA-	I-RAI-WA(JA)									I2-PI-NA-MA	SI-RU-TE-	
IO Za 8	Serpentine round LT*		JA-NA-TI-RAI-WA-JA										SI-RU-TE-	
IO Za 6	Alabaster cup, petals	TA-NA-I-RAI-U-TI-NU-I-NA-TA-		I-2U-		DI-SI-KA		JA-SA-	SA-RA-ME					
TL Za 1	Marble ladle	A-TA-	I-RAI-WA-JA	O-SU-QA-RE				JA-SA-	SA-RA-ME					
IO Za 2	Square LT*	A-TA-	I-RAI-WA-JA	JA-DI-KI-	TU			JA-SA-	SA-RA-ME		U-N A-KA-NA SI	I-PI NA-MA	SI-RU TE-	
		TA-NA-	RA-TE-U-TI-NU-								U-N A-KA-NA SI	I-PI-NA-MA	SI-RU-TE-	
PK Za 11	Serpentine square LT*	A-	I-RAI-WA-E	A-DI-KI-	TE-TE-	RE-PI-TE-RI-A-KO-A-NE-	A-SA-							
PK Za 12	Serpentine round LT*	A-TA-	I-RAI-WA-JA	A-DI-KI-	TE-		QA-SI		RA-ME A NE-		U-N A-RU-KA-NA-TI	I-PI-NA-MI-NA SI-RU	I-NA-JA-	
PL Zf 1	Silver pin	JA	MI-TE-JA-MU	U-QE-TI				JA-SA-	SA-RA-ME		TA-NU-N I-KI-NA	NI-NU-NI	[-I-	
PR Za 1	Poros limestone box	TA-NA-	SU-TE-DA-KE	SE-TO-I-JA				A-SA-	SA-RA-ME					
KN Za 10	Limestone square LT*	I-TA-NU-	MU-TI					JA-SA-	SA-RA-ME		NA-DA-WA-	I-DU-WA-TO	I-JA	
PS Za 2	Serpentine 3 cup LT*	TA-NA-	I-RAI-TI					JA-TI	JA-SA-	SA-RA-ME			RE-I-KE	
IO Za 7	Serpentine square LT*	A-TA-	I-RAI-WA-JA					JA-TI						
PK Za 8	Stone LT		NU	PA3-E	JA-DI-KI-	TE-TE-	*307 PU2-RE	TU-ME-I	JA-SA-		U-N A-KA-NA-SI	I-PI		
PK Za 15	Serpentine round LT*				JA-DI-KI-	TE-TE-	DU PU2-RE							
KO Za 1	Stone base	A-TA-	I-RAI-WA-JA	TU-RU-SA-		DU PU2-RE			I-DA-A		U-N A-KA-NA-SI	I-PI-NA-MA	SI-RU-TE-	
SY Za 1	Round pedestal LT*	JA-TA-	I-RAI-WA-JA						PA3-NI-WI				JA-	
PK Za 18	Serpentine square LT*								I-DA				JA- JA	
PK Za 17	Serpentine square LT*								I-DA					
KN Zc 7	Cup						DU- RA-RE	A-2U-RA	JA-SA-	RA-A-NA-NE		JA-KA-NU-2A-TI	MI-PI-	
SY Za 4	Serpentine round LT*	A-TA-	I-RAI-WA-JA	JA-I-NWA-GA					PA3-NI-WI					
AP Za 2	Serpentine round jar											NA-SI	I-PI-NA-MA	
SY Za 2	Square LT*	A-TA-	I-RAI-WA-JA					JA-SU-	MA-TU	OLIV	U-N A-KA-NA-SI		PI-MI-NA-TE-	
IA Za 2b 3	Pithos	A-TA-	I-RAI-DE-KA	A-RE-PI-	RE-NA	TI-TI-KU-VINA32	DI-DI-K	A-SE	A-SA-MU-NE				I-NA-JA-RE-TA	
								A-SE					A-JA	

\*LT libation table

The libation formula starts with either the indefinite article “a” TA-NA (τινά), or the definite article “the” A-TA (τα) in the plural neuter nominative declination. The alternate spelling, JA-TA (αῦτη) could correspond to the demonstrative article “this”, in the nominative declination, either single (οὗτος m., αῦτη f.) or plural (οὗτοι m., αὗται f.)<sup>3</sup>.

Then, follows the content of the libation poured, namely “olive-oil” I-RAI-WA-JA (ἔλαιον+JA or ἔλαιου), or “grain” SE-TO-I-JA (σιτος+JA or σίτου)(PR Za 1). The JA suffix is the plural nominative form of the nouns. Spelling of the content varies, and olive-oil is also written as I-RAI-WA-E (PK Za 11) and I-RAI-U-JA (AP Za 1). Notably, the word for olive oil in Linear A E-RAI-WA, resembles that of Linear B, E-RA-WA. In one instance, “sage-scented olive oil” PA-E (PK Za 8) is named, where PA is a shorthand form of PA-KO-WE used in Linear B. Decryption of the logogram \*301 as RAI, elegantly sheds light on two key ingredients in libations, namely olive-oil and wheat meal, which are associated with the Libation formula as attested by the logogram OLE in SY Za 2. This decryption is further attested by the juxtaposition of E-RAI-WA-JA with A-RE-PI-RE-NA another form of writing “olive oil”, namely “oil” A-RE-PI (ἄλειφαρ) “olive” RE-NA (ἐλαιον) (ZA Zb 3). Both of these nouns are identical with Linear B spellings. Another libation includes “wheat meal” I-RAI-TI (ἀλείατα) (PS Za 2). Spelling of “wheat meal” varies greatly, and includes I-RAI-U-TI (IO Za 6) and RA-TE-U-TI (IO Za 2). Both of these libations, with olive oil and grains, were known to the ancient Greeks, and this formula could be the oldest known evidence for such practices. Also here, decryption of the logogram \*301 as RAI is attested by the superposition of the middle word “wheat meal” (ἀλείατα) of the formula TA-NA-RA-TE-U-TI-NU (IO Za 2) with TA-NA-I-RAI-U-TI-NU (IO Za 6) corresponding to “a wheat meal which” (τινά ἀλείατα ον). TA-NA-RA-TE-U-TI-NU, is a repetition, and consists of two words<sup>4</sup>. Finally, the libation types WI-TE-JA-MU (PL Zf 1.1)<sup>5</sup> and MU-TI (PL Zf 1.1)<sup>6</sup> were not deciphered.

Then comes the libation vessel, which is very often derived from the word for “receptacle” DI-KI (δοχή or δεχάς). Notably, specific vessels are named, such as the “receptacle of grain” SU-TE-DA-KE (σιτοδόκος)(PR Za 1) and the “receptacle of oil” I-RAI-DE-KA (ελαιοδόκος)(ZA Zb 3). These vessel names are formed by combining grain (σιτο) and receptacle (δοχή) into “receptive of grain” (σιτοδόκος), and olive-oil (ἐλαιον) and receptacle (δοχή) into “receptive of oil” (ελαιοδόκος). The decipherment of these specific vessels relies on juxtaposition with their contents, and provide credibility beyond any reasonable doubt. Remarkably, the “receptive of grain” SU-TE-DA-KE (σιτοδόκος) precedes the content “of grains” SE-TO-I-JA (σιτος,-οο +JA plural suffix). Likewise, the “receptive of oil” I-RAI-DE-KA (ελαιοδόκος), precedes the content “olive oil” A-RE-PI RE-NA (αλειφαρ ἔλαιον).

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<sup>3</sup> Alternatively, the indefinite article, “a” could correspond to the single accusative declination, male TA-NU (τινά), female TA-NA (τινά), or neuter A-TA (τι) respectively. Possibly, the definite article “the” corresponds to the single accusative declination male TA-NU (τόν), female TA-NA (τήν), or neuter A-TA (τό) respectively.

<sup>4</sup> Wrongly, TA-NA-RA-TE-U-TI-NU translates into “give (us)” TA-NA (נהנ), “our bread” RA-TE-U-TI-NU (ארוס with the Semitic suffix -יני)

<sup>5</sup> An uneducated guess is MU-TI translates into μοῖτος -ό, Sicilian for χάρις, thanks, favour, (μοῖτον ἀντι μοῖτου like-for-like)

<sup>6</sup> An uneducated guess is WI-TE-JA-MU could be derived from blood (αἷμα) and could correspond to “containing blood” (υφαίμων)

Most often, the libation vessel is not specified, and a general noun is provided for a hollow “receptacle” DI-KI (δοχή or δεχάς). The spelling variations of this vessel are numerous, and at least 3 different variants are found: JA-DI-KI-TU (IO Za 2), A-DI-KI-TE-TE (PK Za 11), JA-DI-KI-TE-TE (PK Za 15). We suggest, the variants could correspond to the same vessel with different demonstrative articles. The single TU syllable, in the vessel name, corresponds to the feminine single nominative demonstrative article, “**this**” (αὕτη). The double TE syllable, in the vessel name, TE-TE corresponds to the neuter single nominative demonstrative article, “**this**” (τοῦτο). Thus, the receptacle DI-KI may be neuter and feminine, in Linear A, perhaps giving rise to multiple spelling of the receptacle δοχή and δεχάς.

As such, the vessel nouns, A-DI-KI-TE could therefore correspond to a “small hand-held vessel about the size of a disk”. This suggestion is attested by the finding that only handheld libation tables are inscribed with this vessel noun DI-KI (IO Za 2, PK Za 11, PK Za 12, PK Za 8, PK Za 15, possibly on PK Za 18), but never mentioned on other vessels such as stone pedestals (SY Za 1), bases (KO Za 1), pins (PL Zf 1), cups (IO Za 6), jars (AP Za 2), pithos (SY Za 2), and ladles (TL Za 1).

Notably, the vessel name DI-KI corresponds to the receptacle noun forming the “grain receptacle” SU-TE-DA-KE (σιτοδόκος)(PR Za 1) and the oil receptacle I-RAI-DE-KA (ελαιοδόκος)(ZA Zb 3). DI-KI is also found in page tablets as DI-KI-SE (δεχάς) (HT 87 and HT 117), perhaps the libation table (phiale) itself.

Temptingly, yet unconvincingly, A-DI-KI-TE-TE could also simply mean “pure” (αθικτος , כתי<sup>7</sup>), for “intact” or “contained” olive-oil. Likewise, A-DI-KI-TE-TE could correspond to “receive”, an imperative conjugation of the verb δέχομαι, (i.e. ἔδεκτο “of things as the object, take, accept, receive, etc). The latter translations are unlikely, for several reasons. First, the libation formula do no seem to contain any verbs in their first half. Second, A-DI-KI-TE seems to correlate with the vessel type. Finally, if A-DI-KI-TE is a verb it disconnects the libation contents.

Another libation formula mentions the disk-shaped tray, and I-NA-TA-I-ZU-DI-SI-KA (IO Za 6), which translates into “**inside this tray**” (εντος ὅς δίσκος). Notably, this disk-shaped vessel, δίσκος, refers directly to the round alabaster cup, that is the Libation table itself (IO Za 6).

The “**libation vessel**”, KI-TE (κυτος, plural κυτου) is also named U-QE-TI (PL Zf 1.1). This vessel could correspond to a bowl for pouring liquids in Hebrew, Kiton (קיתון).

Another vessel name mentioned in the libation formula is O-SU-QA-RE and likely refers to “**the shovel**” (ἡ σκαλίζ), or ladle on which the Libation formula is inscribed. This vessel name is also referred to as SU-KI-RI-TA (PH Wa 32) and A-SI-KI-RA (KH 20) in page tablets. The name O-SU-QA-RE is reminiscent of the Eskar (אשכר) libation presented by the kings of the sea-isles, and named in Psalms 72, 10<sup>8</sup>. Another libation vessel variant is TI-TI-KU (ZA Zb 3), and corresponds to the inscription found on a pithos fragment JA-TI-TU-KU / JA-TI-TU-KU (LA Zb 1 bis), and could be a bowl measure for wine. No Greek namesake was identified for these vessels, however if the prefixes TI (τη), and JA-TI (αὔτη) are just articles, then TI-KU stems from “case” (θηκη).

<sup>7</sup> Leviticus 24, 2 “צו אַת בְּנֵי יִשְׂרָאֵל וַיִּקְחוּ אֵלֶיךָ שֶׁמֶן זַיִת זָךְ כִּתִּית לְמִאֹר לְהַעֲלֹת נֵר תָּמִיד”

<sup>8</sup> Psalms 72, 10 “מִלְכֵי תַרְשִׁישׁ וְאַיִים, מִנְחָה לְשִׁיבוֹ; מִלְכֵי שֶׁבַא וְסָבָא, אֲשֶׁר יִקְרִיבוּ”

Lastly, an additional libation vessel name is TU-RU-SA (KO Za 1). This vessel is also referred to as A-TU-RI-SI-TI (KN Zb 5) which corresponds to a “**tall handle-less vase**”. The noun TU-RU-SA is likely the unaltered form, while A-TU-RI-SI-TI contains the demonstrative form with prefix A-, and the suffix -TI (αὐτή). It has been speculated that TU-RI-SI is the triple measure of one KI-RA<sup>9</sup>. Tentatively, TU-RU-SA could simply correspond to “crop” (θερος, -το). Less possibly, if TU-RU-SA is a “bunch of grapes”, from Greek βοτρυς or “wine” from Hebrew tiros’ (תירוש), then TU-RU-SA may become “grapes (wine)”.

Sometimes, the libation formula includes additional crops, such as “**wheat**” PU-RE (πυρος)<sup>10</sup> and “**barley**” RA-RE (ὄλυραι) or “**wheat meal**” RA-RE (ἄλευρα) (KN Zc 7, HT Zb 160, PK Za 15, KO Za 1, and PK Za 8). As indicated in the formula, the wheat and barley are preceded by DU which corresponds to “**this**” (ὃδε), the demonstrative article in singular masculine declination. Notably, in one case, the wheat offering is shredded, and “wheat meal” is given, as indicated by the adjective “**shredded**” TU-ME-I (τομαῖος)(PK Za 8). In another case, the libation includes “**wine**” A-ZU-RA (ἄζωρος)(KN Zc 7), JA-I-NWA-ZA (οἶνος)(SY ZA 4).

Then, the divinity is invoked, namely the “**Ashera pole**” JA-SA-SA-RA-MA (IO Za 2, TL Za 1, IO Za 6, PL Zf 1, KN Za 10, IO Za 9, PS Za 2.2) which is composed of two words JA-SA, and SA-RA-ME. The word JA-SA is simply “**unto**” (εἰς)<sup>11</sup>. The word SA-RA-MA corresponds to the “divinity” name, and refers to the Ashera or Asherim poles which is feminine in singular Ashera (אשרה), and masculine in plural (אשרים). This deciphering is further corroborated by the fact that JA-SA-SA-RA-MA is aligned with the synonymous deity JA-SA-RA-A-NA-NE (KN Zc 7) transliterated into “**unto**” (εἰς) “**luxuriant tree**” (עץ רענן), that is an Ashera Pole. The name Ra’anane (רענן) appears in the bible, and is associated with a stone libation altar (מצבה) under a tree, in the Biblical verse: “And they set up for themselves stone altars and Asherah poles, on every high hill and under every luxuriant tree”<sup>12</sup>. In this context, the divinity name JA-SA-RA-A-NA-NE is synonymous to JA-SA-SA-RA-MA, the Ashera tree pole (pl. Asherim tree poles). Following this logic, JA-SA-RA-A-NA-NE is a synonymous invocation of the divinity JA-SA-SA-RA-MA, which are both derived from Semitic tree pole deities, namely אשרה and רענן.

This finding is potentially corroborated by the alignment of SA-RA-MA with ideogram \*321 that is shaped like the labrys, the double edged ax (IO Za 7). If so, then ideogram \*321 differs from logogram \*321. As depicted on the Aghia Triada sarcophagus fresco, the labrys caps the Ashera poles, and \*321 could be an ideogram of SA-RA-MA.

Other times, the divinity is not named, and a “**Goddess**” I-DA-A is invoked, such as in I-DA-A (θεά) (KO Za 1), I-DA (θεά, or δεά in Tyrrhen.) (PK Za 18), and in the alternate form I-DA-MI (δαίμων) (SY Za 1). Alternatively, the libation formula I-DA-A invokes a “heavenly god” (δῖος), or the “sitting-place of Gods” (ἔδος), and possibly the labrys itself which carries a similarly sounding inscription I-DA-MA-TE (AR Zf 1). I-DA-MA-TE has been proposed earlier to correspond with an epithet of Demeter (Δημήτηρ), the God mother (θεο μήτηρ).

<sup>9</sup> <http://www.people.ku.edu/~jyounger/LinearA/>

<sup>10</sup> Temptingly, DU-PU-RE could describe the material of which the phiale is composed of. In line with this thought, DA-PI-TE-RI (DA+πετρος)(PK Za 11), DU-PU-RE (DA+πωρεία), and DU-PU2-RE (DA+πωρεία), record that the libation vessels are made “of stone”. In the former case, DA-PI-TE-RI A-KO-A-NE (PK Za 11) translates into “that” A-KO-A-NE (εκείνου) “stone” DA-PI-TE-RI (DA+πετρος).

<sup>11</sup> An uneducated guess proposes JA-SA is a tree (עץ)

<sup>12</sup> Kings II, 17, 10 “וַיִּצְבּוּ לָהֶם מִצְבּוֹת וְאֲשֵׁרִים עַל כָּל גְּבֻעָה גְבוּהָ וְתַחַת כָּל עֵץ רֵעֵנִי”

Then, follows the action “**which I emptied**” with several spelling variations U-NA-KA-NA-SI (IO Za 2, TL Za 1, KO Za 1, PK Za 8), U-NA-RU-KA-NA-TI (PK Za 11), U-NA-RU-KA-JA-SI (PK Za 12) or TA-NU-NI-KI-NA (PL Zf 1). The action is composed of two words. The first word, U-NA “which” (ov), combines with the next word, KA-NA-SI “I emptied” (κενός or εκκενουν), conjugated in the first person, to form the action “which I emptied”. In the multiple sequence alignment, KA-NA-SI is synonymous with RU-KA-NA-TI derived from the Hebrew verb ‘to empty’ Roken (רוקן), also declined in the first person of the singular, meaning and RU-KA-NA-TI which literally also means, “I emptied” Rukanati (רוקנתי). Thus, the two aligned variants are synonymous, although one is proto-Greek, and the other is proto-Semitic. Other variants include “which” U-NA (ov) “I empty” RU-KA-JA-SI (רוקיחי), and “the” TA-N (τόν) “which” U-NI (ov) “empty” KI-NA (κενός). Such double vernaculars are found in many languages inheriting foreign loanword for synonymous vocabulary. For example, in Spanish, the word ‘scorpion’ has two synonymous names, namely alacran (Arabic العقرب) from Arabic, and escorpion (Latin Scorpiones) from Latin. Here too, KA-NA-SI is proto-Greek, and RU-KA-NA-TI is proto-Semitic. Alternatively, KA-NA-SI could correspond to the to the proto-Greek form of “I inaugurate” (εγκανασσειν).

Then comes I-PI-NA-MA (IO Za 2, TL Za 1, KO Za 1, PK Za 8, AP Za 2, VRY Za 1) which is “**I distribute**” (ἐπένειμε) or the synonymous variant A-PA-DU-PA (PK Za 12) which stands for “from here before” (απο δω προ) [alt. “in front of” (απέναντι από)]. Finally, the synonymous variant I-PI-NA-MI-NA () is also of Semitic origin for “in front of him/her” (ופני מינה). Often, the words ‘empty’ and ‘face’ appear hand-in-hand in the Bible, as seen in the verse “They shall not see my face empty handed”<sup>13</sup>, related to seeing the Lord’s face. Likewise, the words U-NA-KA-NA-SI for “I emptied” and I-PI-NA-MA for “before the face”

[I tilt (ἐπινεύω) the preserved corner is "perforated" (PM II 440), this implies that the hole is drilled all the way through (but see IO Za 2). If all corners were perforated, perhaps the table was suspended, and could be tilted.]

Then comes, SI-RU-TE, (σιρωτόν), a silo for holding wine or vinegar, into which the libation is poured, similar to the silo depicted on the Hagia Triada sarcophagus<sup>14</sup>.

The formula ending in I-NA-JA PA-QA is currently unsolved.

In the following paragraphs are tentative translations of all Libation Formulae, and a linear translation is provided for each linear A formula.

**IO Za 2 (HM 3557) (GORILA V: 18-19), square Libation Table.**

1.: A-TA-I-RAI-WA-JA • JA-DI-KI-TU • JA-SA-SA-RA[-ME • U-NA-KA-NA-]SI [•] I-PI-NA-MA •  
τα ἔλαιου δοχή αὕτη εις אֲשֵׁרָה ον κενός ἐπινάω  
The olive oils of this vessel unto Ashera pole which I empty upon

2.: SI-RU-TE • TA-NA-RA-TE-U-TI-NU • I-••[  
σιρωτόν τινά ἀλείατα ον  
the silo The wheat-meal which

**TL Za 1 (HM 1545) (GORILA IV: 58-59), marble ladle.**

<sup>13</sup> Exodus 23, 15 נִלְא־גֵרָאוּ פְּנֵי, רִיקָם 15.

<sup>14</sup> . which means "I served" SHIRET (, שירת) or a servitude SHIRUTE (שירות). Alternatively, SI-LU-TE could mean “I prayed” SILUTI (צלוחי) or a prayer SILUTA (צלוחא, λτή). Finally, SI-LU-TE could also be “I sang” SHARTI (שרתי), or songs SHIROT (שירות).

a: A-TA-I-RAI-WA-JA • O-SU-QA-RE •

τα ἔλαιου σκαλῖς  
The olive oils shovel (ladle)

b: JA-SA-SA-RA-ME • U-NA-KA-NA-[SI

εις Ἀשרα οὐν κενός  
unto Ashera pole which I empty

c: I-PI]-NA-MA SI-RU-[TE

ἐπινάω σιρωτόν  
upon the silo

**IO Za 6 (HM 3785) (GORILA V: 24-27), stone cup with petaliform rim, of orange-yellow alabaster with white veins.**

TA-NA-I-RAI-U-TI-NU • I-NA-TA-I-ZU-DI-SI-KA • JA-SA-SA-RA-ME •

τινά ἀλείατα εντος ὅς δίσκος εις Ἀשרα  
A wheat meals in this disk unto Ashera pole

**PK Za 12 (HM 942) (GORILA IV: 35-38), round Libation Table, serpentine**

a1: A-TA-I-RAI-WA-JA • A-DI-KI-TE-[

τα ἔλαιου δοχή  
The olive oils of this vessel

a2: -QA

b: ]SI-[ JA-SA-SA-]RA-ME[

εις Ἀשרα οὐν  
unto Ashera pole

c: ]A-[ 2? ]-NE • U-NA-RU-KA[ 1? ]JA-SI •

οὐν ῥοκίτη  
which I empty

d1: A-PA-DU-PA-[ 3? ]JA[ 2? ]JA-

απο δω προ  
from here before

d2: -PA-

**PK Za 11 (HM 1341) (GORILA IV: 32-34), square Libation Table, serpentine**

a: A-TA-I-RAI-WA-E • A-DI-KI-TE-TE-[•

τα ἔλαιου δοχή ταῦτα  
The olive oils of this vessel

b: •]-RE • PI-TE-RI • A-KO-A-NE • A-

πετρος ἐκείνου εις  
stone that unto

c: SA-SA-RA-ME • U-NA-RU-KA-NA-TI •

Ἀשרα οὐν ῥοκίτη  
Ashera pole which I empty

d: I-PI-NA-MI-NA[ ] SI-RU-[•] • I-NA-JA-PA-QA

ἐπινάω σιρωτόν  
upon the silo

**KO Za 1 (HM 2627) (GORILA IV: 18-20), stone base**

A-TA-I-RAI-WA-JA•TU-RU-SA•DU-PU-RE-I-DA-A•U-NA-KA-NA-SI•I-PI-NA-MA•SI-RU-TE

τα ἔλαιου θερος ὄδε πυρος θεα οὐν κενός ἐπινάω σιρωτόν  
The olive oils crop this wheat Goddess which I empty upon the silo

**PK Za 8 (HM 618) (GORILA IV: 24-27), stone libation table**

a: ]-NU • PA3-E • JA-DI-KI-TE-TE- DU -PU2-RE • TU-ME-I

τινά PA δοχή ταῦτα ὄδε πυρος  
A sage-scented-oils of this vessel this wheat

b: JA-SA-[ ] U-NA-KA-NA-SI[ ]

εις Ἀשרים ον κενός  
unto Ashera pole which I empty

c: I-PI-[

ἐπι  
upon

**PL Zf 1 (HM 498) (GORILA IV: 161, 162), silver pin**

]TA•WI-TE-JA-MU• U-QE-TI• JA-SA-SA-RA-ME• TA-NU-NI-KI-NA•I-[PI-NA-MA]

τα υφαίμων κυτος εις Ἀשרים τινά ον κενός ἐπινάω  
The blood-containing receptacle unto Ashera pole (a?) which I empty upon

**PR Za 1 (HM 2444) (GORILA IV: 46-49) Poros limestone box**

a: TA-NA-SU-TE-DA-KE

τινά σιτοδόκος  
A grain-receptacle

b: SE-TO-I-JA

σιτοο  
grains

c: A-SA-SA-RA-ME

εις Ἀשרים  
unto Ashera pole

**KN Za 10 (HM 2100) (GORILA IV: 8-9), square Libation Table, limestone**

a: ]-TA-NU-MU-TI • JA-SA-SA-RA-MA-

τινά μοῖτος εις Ἀשרים  
A favour unto Ashera pole

b: -NA • DA-WA-[•]-DU-WA-TO • I-JA[

ον  
which I give?

**AP Za 2 (HM 2479+2480) (GORILA IV: 4-5), cylindrical jar, serpentine**

1: ]NA-SI • I-PI-NA-MA [ ••••• ]I-KU-PA3-NA-TU-NA-TE [

κενός ἐπινάω  
empty upon

2: ]PI-MI-NA-TE • I-NA-JA-RE-TA[ ••• ]-QA •

**PK Za 15 (Ayios Nikolaos Mus. 2469) (GORILA IV: 41), circular Libation Table, serpentine**

]• JA-DI-KI-TE-TE-DU-PU2-RE[

δοχή ταῦτα ὄδε πυρος  
of this vessel this wheat

**VRY Za 1 (Rethymnon Mus. 685) (GORILA IV: 61), square serpentine Libation Table.**

a: ]I-PI-NA-MA

ἐπινάω  
upon

b: SI-RU-TE • [

σιρωτόν

the silo

**SY Za 3 (HM 3757) (GORILA V: 66-67; ArchEph 2008, 198-9, 205-7), circular Libation Table, serpentine** (

A-TA-I-RAI-WA-[JA --- ca. 8 ---]•••SE-KA-NA-SI[•]TE[--- ca. 10 ---]SI-RU-TE  
τα ἔλαιου κενός σιρωτόν  
The olive oils I empty the silo

**IO Za 9 (HM 3898) (GORILA V: 32-33), square Libation Table, marble.**

.a (retrograde): JA-SA-SA[-RA-ME  
εις Ἀשרים  
unto Ashera pole

.b: • U-NA-KA[-NA-SI  
ὅν κενός  
which I empty

**SY Za 1 (HM 3459) (GORILA V: 62-63; ArchEph 2008, 197-8, 201-3), circular, pedestalled Libation Table**

]A-TA-I-RAI-WA-JA • I-DA-MI • JA-•-[  
τα ἔλαιου δαίμων  
The olive oils Goddess

**PK Za 18 (Ayios Nikolaos Mus. 7233) (GORILA IV: 44), Libation Table, serpentine**

]TE • I-DA • JA-JA-[  
θεα  
Goddess

**PK Za 17 (Ayios Nikolaos Mus. 7232) (GORILA IV: 43), square Libation Table, serpentine**

]I-DA • [•]  
θεα  
Goddess

**PS Za 2, serpentine offering table or kernos with 3 cup sinking**

1 24?? ]-RE-I-KE  
ריק  
empty  
2 TA-NA-I-RAI-TI • [ 6? ]-JA-TI • JA-SA-SA-RA-ME •  
τινά ἀλείατα εις Ἀשרים  
A wheat meals unto Ashera pole

**IO Za 7 (HM 3784) (GORILA V: 28-29), square Libation Table, serpentine**

A-TA-I-RAI-WA-JA • JA-TI-•321 [  
τα ἔλαιου αὕτη LAB?  
The olive oils this Ashera pole (Labrys)

**KN Zc 7 (HM 2629) (GORILA IV: 122-125), cup**

A-KA-NU-ZA-TI • DU-RA-RE • A-ZU-RA • JA-SA-RA-A-NA-NE • WI-PI-[•]  
κενός ὄδε ἄλευρα ἄζωρος εις ῥεῖνον  
I empty this wheat-meal wine unto luxuriant tree



**Figure. Pim weight and spindle-whorls.** Shown on the left, is a Pim weight with Phoenician inscription for PIM (𐤓 𐤍 𐤏) of unknown provenance. Shown on the right, are two “spindle-whorls” with Linear A inscriptions PI-MI-TA-TI-RA2 unearthed in Troy. The spindle-whorls could indeed not be spindle-whorls be weight measures, similar to the PIM.

### Discussion.

Our decipherment of the libation formula suggest that Linear A scripture was a language mixture of Mycenaean Greek, with proto-Semitic influences. We propose that the syllable \*301 corresponds to RAI (or LAI).

Remarkably, the decipherment is attested by several indicators. First, the libation vessels SU-TE-DA-KE (σιτοδόκος)(PR Za 1) and I-LAI-DE-KA (ελαιοδόκος)(ZA Zb 3), are followed by their contents, “grains” SE-TO-I-JA (σιτος,-oo gen.)(PR Za 1), and “olive oil” A-RE-PI (ἄλειφαρ, oil), and RE-NA (ἔλαιον/ἔλαιος olive)(ZA Zb 3) respectively. Also, SE-TO-I-JA (σιτος,-oo) refers to grains, and describes the type of offering. Interestingly, SE-TO (Σιτώ)<sup>17</sup> is the Greek epithet of Demeter, I-DA-MA-TE later invoked as JA-A-SA-SA-RA-ME. As depicted on the Aghia Triada sarcophagus fresco, the I-DA-MA-TE labrys caps the Ashera poles, and \*321 could well be an ideogram of SA-RA-MA.

The libation formula contains several parallels to the pouring of oil unto a stone altar described in the Bible<sup>18</sup>: “And Jacob awoke in the morning, and took the stone he put under his head, and placed it as an altar, and poured oil on it”. The story continues with Jacob promising to tithe all of his belonging, in exchange for Gods protection: “And this stone I have set up as a pillar will be God’s house, and of all that You give me I will surely give You a tenth”. The stone is said to be a “house of God”<sup>19</sup> (I-DA-A ἔδος), and remarkably the verse records the Hebrew formula “Aser Aasarenu”, distantly reminiscent of JA-SA-SA-RA.

The Ashera pole and it’s sacred stones are also known from the Bible. Exodus 34:13 states: "Break down their altars, smash their sacred stones and cut down their Asherim [Asherah poles]." The Israelites were commanded to get rid of the idolatry, which included libations on to sacred stones, placed between Ashera poles. Here, we showed that the Ashera poles are mentioned in the formula inscribed on these libation stone. In addition, the Ashera poles, and libation stones are depicted on the Haghia Triada sarcophagus. In the Haghia Triada sarcophagus, the Ashera poles are topped by labrys, double bitted axes.

The labrys (πέλεκυς), could corresponding to the double edged sword (להט החרב המתהפכת), that guard the entrance of the garden of Eden<sup>20</sup>. Alongside the labrys, cherubs are mentioned, just as depicted on the Aghia Triada sarcophagus fresco. The labrys placed on top of a pole could have served as an early lightning rod, as attested by the modern Greek word for lightning

17 Henry George Liddell. Robert Scott. A Greek-English Lexicon. revised and augmented throughout by. Sir Henry Stuart Jones. with the assistance of. Roderick McKenzie. Oxford. Clarendon Press. 1940.

18 Genesis 28, 18. וַיִּשְׁכַּם יַעֲקֹב בַּבֹּקֶר וַיִּקַּח אֶת הָאֶבֶן אֲשֶׁר שָׁם מִרְאשֵׁיתוֹ וַיִּשָּׂם אֹתָהּ מִצְבֵּה וַיִּצַק שָׁמֶן עַל רֹאשָׁהּ

19 Genesis 28, 20. וְהָאֶבֶן הַזֹּאת אֲשֶׁר שָׁמַתִּי מִצְבֵּה יְהוָה בַּיַּת אֱלֹהִים וְכָל אֲשֶׁר תָּתֵן לִי עֲשֹׂר אֲעִשְׂרֶנּוּ לְךָ

20 Genesis, 3, 24. וַיִּגְרָשׁ אֶת-הָאָדָם; וַיִּשְׁכַּח מִקְדָּם לֶגֶן-עֶדֶן אֶת-הַפְּרִיבִים, וְאֵת לֶהֱט הַחֶרֶב הַמִּתְהַפֶּכֶת, לְשֹׁמֵר, אֶת-דֶּרֶךְ עֵץ הַחַיִּים

(ἀστροπελέκι), associated with rain, and symbolizing fertility and being favored by the God. The labrys could imitate a tree, and be positioned on a hill-top that was naturally more likely to be hit by lightning.

Due to the unique geographical location of Crete, we hypothesize that the Minoan civilization was a melting pot, which was influenced, by proto-Greek (i.e. early Myceneans), and by proto-Semitic (i.e. early west Semites and Phoenicians) populations. Specifically, we assume Minoan was a language mixture based mainly on Greek grammar and vocabulary with some proto-Semitic verbs and deities. In addition, we hypothesize that the syllabary used for Linear A and B is identical.

Other divinities include the Phoenician god “Eshmun” A-SA-MU-NE (𐎗 𐎎 W 𐎎) (ZA Zb 3), Ashera's consort associated with the Asclepius staff. Notably, in this context the name Eshmun is associated with olive oil (שמן).

We hypothesize that the liquid consonants, L and R are interchangeable. This hypothesis is supported by the peculiar lack of any letter for the sound L, and by earlier suggestions that “total” KU-RO (no Greek likeness) should be read as KU-LO (כולו). The interchangeable nature of the L and R sounds is attested in several Hebrew synonyms, for example “chain” sharsheret (שרשרת) and shalsholet (שלשלת), “fell” nashal (נשל) and nashar (נשר), “stone-pit” garin (גרעין) and galin (גלעין), “tree(-grove)” ashera (אשרה) and eshel (אשל), whisper lachash (לחש) and rachash (רחש).

Unlike ancient Greek, the sentences do not seem to follow the subject verb object (SVO) structure, and the spelling of Linear A varies somehow over time, and location.

The Minoan culture was named by Evans after king Minos, who in Greek mythology inhabited Crete. However, Minoan also sounds quite like Manoah (מנוח)<sup>21</sup>, the father of the biblical judge Samson, who both interacted much with the philistines, who were related to the Cretans. Manoah could be the Hebrew cognate name of Minos, which was adapted into Greek language using the consonant suffix “s”, common to male names. The suffix consonant is common in transliteration of Hebrew names into Greek, such as Isaia -> Isaias, Mose -> Moses, and Jeremia-> Jeremias. Possibly, spoken Minoan was somewhat different from its written form, and over the centuries, as the language evolved, so did the written version, until Linear B was adopted. This evolution could help explain the variations of the libation formula.

The Cherethites and Pelethites (כרתים ופלתי in Hebrew) were people living in the land of the Philistines according to the Bible<sup>22</sup>. The Pelethites (פלתי) are likely identical to the ancient Philistines (פלשתים), the former name being a linguistic corruption of the latter<sup>23</sup>. While the Pelethites (i.e. Philistines) were an oversea people that came from the island of Caphtor (כפתור)<sup>24</sup>,

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<sup>21</sup>Judges, Chapter 13-14

<sup>22</sup> 1 Samuel 30:14. Specifically in the Negev, near Ziklag.

<sup>23</sup> The Jewish Encyclopedia. New York. Funk & Wagnalls

<sup>24</sup> Amos 9:7. “Are not you Israelites, the same to me as the Cushites declares the Lord. Did I not bring Israel up from Egypt, the Philistines from Caphtor and the Arameans from Kir” The exact identity of Caphtor island is debated, and based on the name alone seems to correspond to Cyprus (בפתור-<כפרת) when read as Caphroth

the Cherethites (כרתים) would have come from the island of Crete<sup>25</sup>. Another link between the Cherethites and Minoan Crete is attested by city names, such as Ekron and Heraklion; Askalon and Skalani, Gaza and Gazi, Ziklag and Tsikalaria, and so on. Also the fact that Linear A artifacts were found in Tel Haror, Israel attests to the link between Cherethites and Crete.

The Cherethites and Pelethites language has not been identified, yet it was spoken among king David's elite guards seemingly without communication barriers<sup>26</sup>. Thus, their language could have been mutually intelligible with ancient Hebrew, giving rise to the hypothesis that the Cherethite and Minoan languages contained a Semitic substratum.

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<sup>25</sup> The Cherethites sound like Crete in Hebrew.

<sup>26</sup> 2 Samuel 8:18