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Research Paper

An Estimate of the Indus Valley Language Phonology

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ABSTRACT: *In this paper, a study is presented for the decipherment of the Indus Valley Script and the determining of the rendered language, termed Indus Valley Language. The study is mainly based on three pillars: the first being the pictorial similarity of the Indus Valley Script signs to other contemporary scripts, notably the Minoan scripts of Crete and Cyprus; the second being the linguistic affiliation to Sumerian and other Altaic languages; the third being a broader knowledge of Comparative Linguistics. The result finally describes an Altaic language, written with a script of 67 main syllabograms.*

KEYWORDS: *Indus Valley, Cretan Protolinear, Altaic, Sumerian, Minoan, script, syllabary.*

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I. INTRODUCTION

The Bronze Age period of material culture lasted approximately two millennia, mainly the 3rd and 2nd ones BCE [1] (yet starting about the mid-4th millennium in Caucasus [2] and perhaps the 5th millennium BCE in the Balkans [3]). During this broad period, six literate civilizations flourished in the temperate climatic zone of Eastern Mediterranean Sea and South Eurasia: the Mesopotamian, the Ancient Egyptian, the Oxus (alias Bactria–Margiana), the Elamite, the Aegean and the Indus Valley ones. The Mesopotamian civilization was initially expressed through the Sumerian culture and later through the Akkadian. Accordingly, the Aegean Civilization was initially expressed through the Minoan culture, centred in Crete, and later through the Mycenaean culture in mainland Greece; the former ones being adopted by the latter ones in both cases. Geographically, the Aegean Civilization had been the westernmost one, while the Indus Valley Civilization (IVC) the easternmost one. The Mesopotamian Civilization had been most influential in its surrounding areas, like Anatolia and the Levant, especially through its mature writing system: the Sumerian Cuneiform script.

Distinct writing systems had been developed in each civilization, for various purposes, which are characteristic of the corresponding civilization. The most general-purpose scripts were the Ancient Egyptian (Hieroglyphic/Demotic) and the Sumerian (pre-Cuneiform/Cuneiform), presumably developed independently [4]. The general-purpose Elamite scripts (Proto-, Linear and Cuneiform) of the Iranian Plateau were clearly influenced by the corresponding Mesopotamian scripts [5]. The Aegean scripts [6], excluding the related Cypriot ones, were used for recording commodities (Linear-A/B), on seals or for ritual purposes (Cretan Hieroglyphs). Linear-A rendered the so-called "Minoan" language, still undeciphered, while Linear-B rendered the so-called Mycenaean Greek, the oldest known dialect of Greek. The most comprehensive theory on the development of the Aegean scripts is the Cretan Protolinear Script (CPS) theory, proposed in [7], introduced in [8] and refined in [9]. According to the CPS theory, Linear-A/B were developed from a common ancestor (i.e., CPS) of pre-Cuneiform Sumerian origin, while the Cretan Hieroglyphs were merely its ornamental and ritual version [10]. The debated Oxus script has been found only on seals [11] and inscriptions on other artifacts [12], with signs similar to the Aegean scripts. Finally, regarding the Indus Valley Script (IVS), although its usage as such has been debated [13], its similarity in appearance and function to the Mesopotamian ones (found mainly on seals) has been observed in [14] and [15]. Regardless, the longest extant IVC inscription found (see [16]), is enough of a proof that IVC was a literate civilization.

The IVS rendered potentially one or more languages; the predominant hypothesis, also adopted herein, is that it rendered one language, conventionally called Indus Valley Language (IVL), found also as "The Harappan language", named after the major city of IVC excavated so far. Since IVL is considered unknown, several

proposals have been made apart from being a language isolate, the most featured being either a (Proto-) Dravidian language [17] or a Para-Munda one [18]. An overall debate can be found in [19] and [20]. It will be demonstrated in the next sections here that IVL can be an Altaic language, related to Sumerian but not identical; on this basis, meaningful interpretations to several IVS inscriptions have been provided.

II. METHODOLOGY

The methodology of the present study has been holistic, not unlike other similar studies, although following a systemic technique (e.g., see [21]). It combines evidence from various disciplines, namely archaeological, geographical, anthropological, and study of cultures and scripts, the main focus being in resorting to Comparative Linguistics for determining the nature of the IVL.

Considering the non-linguistic evidence, it is not always easy to separate evidence of one discipline from that of another. To start with anthropological evidence, in the graves of Mehrgarh, West Asian body types have been discovered [22], pointing to the presence of people from Western Asia there. The statue of the Priest-King (see [23]), although not a directly anthropological piece of evidence, points to a person of conventionally Altaic origin that belongs to a social elite. Mutual commercial contacts of the IVC with regions of the Oxus Civilization have been noted in [24] and [25], but also as far as Mesopotamia [26]. The cultural similarities of the IVC go much further than Mesopotamia to Crete, with outstanding common religious motives [26]. Especially the religious significance of the bull, the bull-head man and the Lady of the Animals are features common in the whole area from Crete to Indus Valley [27], implying a common origin as well.

Considering the linguistic evidence as documented in script, the similarity of the IVS signs to Sumerian ones has been noted in [14] and [15], and especially the similarity with the CPS signs [28]. This extensive similarity also implies a common origin. The evolution of the CPS from the Sumerian pre-Cuneiform has been revealed in [9], where substantial information about the CPS and the Sumerian pictography may be found, while a brief overview is available in [29]. Although the pictorial similarity of two syllabograms from the two different scripts (i.e., the IVS and CPS) does not necessarily mean a common phonetic value conveyed, recognizing this affinity leads to meaningful interpretations of several IVS inscriptions in [28], after determining the phonetic values of the IVS signs [23]. The conclusion of these observations is that an original pictographic script was created by a Proto-Altaic nation in Central Asia, using the rebus principle [30], according to which "… every sign was a simplified sketch of an object, having as its phonetic value the whole name of the object, being usually of a simple syllabic pattern (of a couple of phonemes). Subsequently, every sign of that original script took on a corresponding phonetic value, not identical in all daughter scripts, but rather according to each conveyed language, following the various migrations of the several branches of that ProtoAltaic nation" [28]. A more distant branch of the Proto-Altaic script evolved into the so-called "kök" script or "Turkic runic" script, which has been attested from a much later time (the oldest inscription found is dated 687 CE [31]; that also has some similarities to the mature Minoan writing and the IVS, while the language it conveys is naturally distant). Consequently, the IVL is demonstrated to be a z-Altaic language (Eastern group), related to Sumerian that belongs to r-Altaic languages (Western group) [32], as exemplified below.

III. RESULTS

It is obvious that the IVS is syllabic, each sign conveying a syllable of the CV (consonant - vowel) type, just like the Japanese kana. People who doubt this have not closely observed the inscriptions and they are not familiar with other types of syllabic scripts, like the Minoan scripts. They doubt the syllabic character of IVS based on a number of signs, which appears too large for a syllabic script, but this is too superficial; in fact, the repertory of signs is perfectly typical for a syllabic script: just 67 signs account for 80 percent of usage across the corpus of Indus symbols [33]. Before we explain what signs account for the remaining 20% of the usage, let us make an hypothesis: we have already examined all the inscriptions found in the corpus and concordance of pandit Mahadevan [34], as also all photographs of inscriptions that we could find on the internet, and also found some indications that the IVL possibly had "ə" where Mediterranean and Mesopotamian Sumerian had "e". With all that we have seen so far, we find that the IVL probably had "i" and "o", but we did not find any evidence for phonemic "e" or "u". Surely the IVL had less than the 8 vowels of Emesal, which are found in Mesopotamian and Cypriot Sumerian (that is the 8 vowels system, typical of all Turkic languages except of Chuvash and probably the few relics of Bulgar Turkic [35]). The 8-vowel system of Turkic was a result of the women's sociolect (Emesal) often turning "i" into "ü" and "e" into "ö", while the mainstream dialect originally had 2 central vowels (a, ə), 2 back vowels (o, u) and 2 front vowels (e, i) - in each position there was a distinction between a relatively open and a relatively close vowel. Now, the Indus vowels had not evolved into the 8-vowel system, because if the vowels were 8, then, with at least 16 consonants, there would be 8x16=128 basic syllables, which is a number much higher than the 67 usual signs of the IVS. Even with 6 vowels, the basic syllables would be 6x16=96 (or 94, considering "ji" and "wu" impossible), and that number would be even larger, if the consonants were more than 16. So even the 6 vowels hypothesis is hard to fit.

Now let us hypothesize that the IVL had less than the 6 original vowels of Sumerian and ancient Turkic. The main reason for reducing the number of vowels was to avoid confusion between similar sounds: it was natural to eliminate "e" (/ɛ/ or perhaps /æ/), because it could be confused with "a", and to eliminate "u" because it could be confused with "ə" (which in Indus was pronounced /ɯ/ as in modern Turkic - that is really easy to confuse with /u/). The four remaining vowels, "a, ə, i, o" are hard to confuse with each other (even though we have found some evidence that the Indus scribes sometimes did confuse "o" with "ə".). There are also psychological reasons for eliminating some sounds. For example, some Russians who learn Modern Greek consider /θ/ as an obscene sound, because for pronouncing /θ/ the tongue appears sticking out between the teeth, and that is considered an erotic indication by people who have /f/ but no /θ/ in their native language. In a similar manner, for some people /u/ is considered lascivious or a "brute" sound; we think that this is the reason why Japanese do not pronounce "u" as /u/ (their "u" is a close near-back vowel with the lips unrounded [ɯ̟] or compressed [ɯ̟$^{\beta}$] [36]), because much rounding of the lips is felt as lascivious, and because the sound of /u/ is felt as ignoble. "E" could also be considered an "ignoble" sound; at least in modern Greek, "e" (/ɛ/) as an exclamation to attract attention or as an answer to being addressed by someone, is considered impolite. Also, "u" is a rude exclamation in Modern Greek. All that said, "u" and "e" could still be heard sometimes as allophones: "u" as an allophone of "o" and (in specific context) of "ə", and "e" or "je" as allophones of "i".

Such a 4-vowel system is not strange; many languages have difficulty in distinguishing between i and e, u and o; in the northern dialects of Modern Greek, for example, o and e are pronounced as nearly mid vowels when stressed, but they are narrowed to u and i when unstressed. Austronesian, and in particular the languages of Philippines typically have a 3-vowel system today (a, i, u with some allophones: stressed vowels tend to be more open), but surely they also had a "ə" some time ago, which has turned into u/o in Bicol, Cebuano etc., while it has turned into "i" in Tagalog, e.g., "deaf" is "bungol" in Bicol and Cebuano, but "bingi" in Tagalog, and there are hundreds of words which show the same correspondence between "u" and "i", which reveals an older common "ə". Also, the Western Desert aboriginal Australian languages have a 4-vowel system: "aa" (long a, which is not very common), "a", "i" and "u", with some allophones.

The 4 vowels hypothesis of IVL was subsequently strengthened by the observation that there were 4 signs representing each vowel alone standing as a syllable; such signs are easily recognized because they are used only in the beginning of words, or they stand at the beginning of the second component of a compound word. Some exceptions can be "i" and "o" used for "j" and "w" respectively after an open vowel (that is typically "a"); or e.g. an "i" after "ti", to indicate a long "i" there. Another characteristic of the "vowel only" syllabograms is that they are not found reduplicated, e.g. we may find "ga ga" or "mi mi", but "a a" or "ə ə" are not expected, because something had to be between vowels to eliminate the hiatus. The frequency and position of the vowel-only syllabograms indicates their quality, e.g. "a" is not expected to be equally frequent as "ə", just as in Turkic languages a- in the beginning of words is much more frequent than ı-. With such criteria, it has been easy to identify the "vowel only" syllabograms of IVS and they were found to be exactly four; one of them is relatively rare, usually found in one and the same word, namely the syllabogram "ə", as expected. Since the vowel-only syllabograms were exactly 4, this proves that the vowels of the IVL were no more and no less than four.

So now, continuing with the hypothesis that the IVL had 4 vowel qualities: a, ə, i, o; then, the consonants would be 16, similar to those of late Sumerian, with the /ŋ/ having turned to /n/ (and /m/). Disappearance of /ŋ/ is a common phenomenon in many languages, including Sumerian and Turkic; Emesal and the Cypriot dialect of Sumerian had turned /ŋ/ to /m/ in all instances; old Turkic had dropped every /ŋ/ in the beginning of words (see phonetic rule 5.0.18 in [32]) and later turned it into /n/ or /m/ within words, e.g., modern Turkish "domuz" (pig) was "toŋuz" in old Turkic; so Turkish and some other modern Turkic languages have no more /ŋ/, which was a frequent sound of the ProtoHuman language [37] but today very few people around the globe can pronounce /ŋ/ unless after a vowel and before a velar consonant or in the end of a word. So, without the /ŋ/, the consonant phonemes of IVL were similar to those of late Sumerian, namely:

k, g, t, d, n, p, b, m, j, r, l, w, x, š, s, θ.

Consonants:

- k, g, t, d, p, b basically represent a distinction between aspirated (k, t, p) and non-aspirated emphatic or tense (g, d, b);
- probably the Indus "k" was velar or uvular, while "g" was palatal or articulated more front in the mouth than "k": this is a strong tendency in all Turkic languages, including Sumerian of all types.
- in Sumerian, "d" represents a dental while "t" a (post)alveolar, as "d" and "t" could be spirantized to "z" (/θ/) and "s" respectively; probably the same distinction existed in IVL.
- "x" was /x/, just like Sumerian "ḫ";
- "š" corresponds to Sumerian "š", so it must have been /ɕ/;
- "θ" corresponds to Sumerian "z", which was pronounced /θ/, according to our research (not "ts" anyway, which would be confused with the aspirated "t");

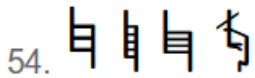
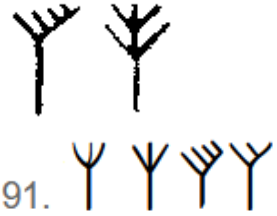
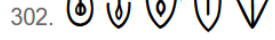
- "j" means /j/;
- "l" could have been retroflex as in Sumerian, but that is not certain.

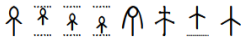
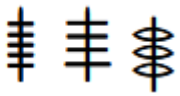
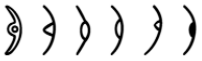
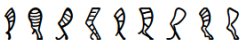
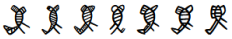
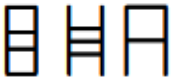
Consequently, on the hypothesis that these 16 were the consonants and a, ə, i, o were the 4 vowels, the basic syllables of IVL were 16x4=64 plus the 4 vowels alone standing as syllables, this makes 68; but one of those 68 would be impossible: namely, it was impossible to pronounce "ji", because "ji" cannot be distinguished from "i". The result is 67 basic syllables, and exactly 67 is the number of the signs that "account for 80 percent of usage across the corpus of Indus symbols" [33]. The remaining 20% is simply variants, ligatures, signs with diacritics, and logograms indicating professions.

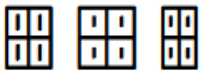
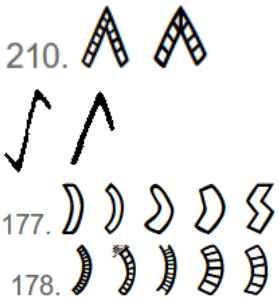
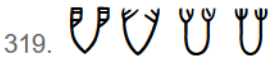
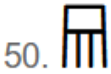
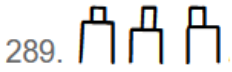
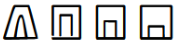
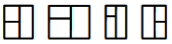
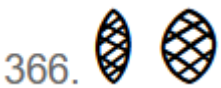
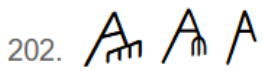
So, the 4 vowels and 16 consonants hypothesis fits perfectly into place. Subsequently, after examining all the inscriptions available in Mahadevan [34] and the photographs of inscriptions on the internet, we have found nothing to doubt the 4 vowels and 16 consonants hypothesis; rather, all phonetic signs of the IVS fit perfectly in a grid of 67 syllabic signs.

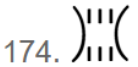
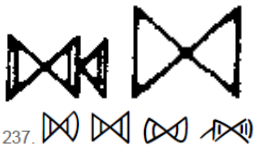
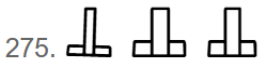
The provisional grid with all the syllabograms of the IVS follows (Table 1); note that not all variants of each sign could be included, but the images given will be sufficient for the reader to have an idea of what forms each sign could take. Some images are taken from [34] while others are from [38]. Below the images of each sign is the name of the thing that was used for the syllabogram; if the word ended in a consonant (in brackets), that consonant was usually not pronounced, unless followed by a vowel. In a few cases, there was a prothetic unstressed vowel that could be omitted in quick speech and was not used for the syllabogram, just as in Minoan the syllable "ma" was represented by "amá(r)" ("calf"). What the depicted thing was, is indicated in quotation marks.

Table 1: Grid with the syllabograms of the IVS.

a  a(m) "cow"	ə  ə(r) "plough"	i  i(p) "comb"	o  o(s) "horn of animal (especially of deer)"
ka  ka(p) "bow"	kə  kə(r) "mountains; wild land"	ki  ki(l) "spindle"	ko  ko(k) "conch shell"
ga  ga(r) "wheel"	gə  gə(d) "fish"	gi  gi(r) "reptile (aroused)"	go  go(l) "great"
ta  ta(l) "pudendum" and	tə 	ti	to

296. 309.  ta(g) “container; case; quiver”	tə(r) “four”	 ti(l) “arrow”	 120.  to(m) “axe”
da  da(l) “thorn”	də  192. də(r) “upright horn or other object standing firmly vertically”	di  90. di(k) “ticks, ants or other small insects (considered harmful)”.	do  108.  do(b) “cereals”
na 123.  na(l) “lotus; Nelumbo”	nə  162.  nə(r) “moon” and 114.  nə(r) “lustrous bead”	ni  ni “eggs; testicles”	no  376.  no(x) “coconut”
pa 56.  pa(t) “leg”	pə 196.  197.  pə(t) “pair; completeness; perfection”	pi  pi(š) “three”	po 283.  po(s) “vine; cultivated plants with supports”
ba  ba(g) “crab”	bə 83.  bə(θ) “salamander; frog” and 116.  bə(r) “butterfly”	bi 292.  bi(n) “ladder; stairs; upstairs”	bo 217.  bo(d) “buttocks and thighs”
ma  ma(n) “two”	mə 	mi 	mo 171.  mo(n) “stork and similar tall standing birds”

	mə(s) “cloth”	371.  mi(r) “division; order” and  mi “year”	
ja  ja(p) leaf; and  ja(d) “seven”	jə  jə(m) “garlic; aliaceous plants”		jo  jo(l) “scorpion” and jo “a sacred syllable”
ra  (a)ra(n) “goat”	rə  rə(n) “flower”	ri  ri “throwing stick; boomerang”	ro  (o)ro(b) “duck and similar birds”
la   la(g) “swan and similar birds”	lə  (ə)lə “hand”	li  li(m) “five”	lo   lo(x) “deer”
wa     wa “house; building”	wə  wə(θ) “wall”	wi   wi(t) “meat”	wo  wo “both hands; number ten”
xa 	xə 	xi 	xo 

xa(š) “yarn; cord tied around a spool”	 xə(g?) “turtle”	 xi(n) “(double axe symbolizing) lord; God”	xo(p) “ploughshare”
ša  ša(g) “good; sweet; pleasant; benevolent”	šə  šə(s) “hundred; a large square number”	ši  ši(r) “chain”	šo  šo(t) “loom; weaving”
sa (a)sa “one; alone”	sə  sə(s) “metal”	si  si “skin; leather”	so  so(r) “vegetable garden”
θa  θa(g) “brick(work)”	θə  θə(k) “house gecko”	θi  θi(s) “blessing; holiness; divine”	θo  θo(p) “writing tablet; written document”

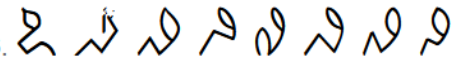
IV. DISCUSSION

Some etymological notes on the IVS grid (Table 1) are discussed below.

1. **a**: The word was a(m): Originally meaning any female animal; in Indus the word came to mean “cow”, similar to “ama” meaning “mother”.
2. **ə**: The word was ə(r): This root is found in many old languages. Proto-Indo-European *er- (hence “earth”); Semitic “arṣ” (earth). More important cognates are the Latin verb “aro” and Greek “aroō” = “i plow”. In Sumerian, cognate words are: wr. ereš$_4$ "cultivator"; ur$_{11}$ (written APIN); and most importantly: “wr. uru$_4$; uru$_4^{ru}$; ur$_5$; i-ru; ru; uru$_{11}$; uru$_{11}^{ru}$ "to sow; to cultivate"”. In Old Turkic the root appears in “bukorsı”, a very ancient word, originally *muk-ors-ı”, literally “a piece of wood that plows” (muk- being the same as Chinese 木 “wood”), that was the most primitive plow, drawn by one only ox [39]. The Indus sign “ə” is identical to the pre-Cuneiform and early Cuneiform sign APIN “plow”, only that the Indus type usually does not indicate the ploughshare. The symmetrical shape of this Indus sign had an esoteric meaning, similar to the Chinese “Tai Chi” or “Yin and Yang” symbol, alluding to the union of yin and yang; quite likely, the act of plowing was likened to sexual intercourse in most ancient cultures, and it may be not fortuitous that the ancient Greek word for coitus, “arotos”, looks like derived from the verb “aro-” (“plowing”). For the ploughshare, see sign “xo”.

3. **i**: The word was i(b): [40]; 239_04 (IB~a):  ; 239_05 (IB~b):  ; Cuneiform  : this sign, IB in Cuneiform, is obviously homomorph to Indus "i", but we could not find the word "ib" itself, which gave its name to the sign. It is obvious from the sign's form that it depicted a kind of comb. The word is related to Turkic "ip" (twisted wool; rope), "iplik" (yarn), "ipek" (silk). The root originally meant the process of carding wool or other materials in order to make yarn and fabrics. This may explain why IB was used in Cuneiform to write "dara$_2$" in "wr. dara$_2$; ^{da}-^{rum}dara$_2$; ^{tug_2}dara$_4$; ^{tug_2}dara$_2$; ^{tug_2} ^{da}-^{ra}dara$_2$ "belt, sash, girdle; loincloth; string"" and wr. niŋ$_2$-dara$_2$; ^{tug_2}niŋ$_2$-dara$_2$; ^{kuš}niŋ$_2$-dara$_2$; ^{kuš}niŋ$_2$-ŋidru "rag, sanitary towel".
4. **o**: The word was "o(s)", cognate to Sumerian u(s) "tusk"; Turkic az(ığ); seems also cognate to I.E. Greek "osteon, ostracon"; Latin oss-; Sanskrit "asti" (bone). Probably ProtoHuman root "oθ".
5. **ka:** From word "ka(p)": The root of this word can be found in all ancient languages, hence in many modern languages too. It meant (to bend something into) a circle or part of a circle, that is an arch. Hence there was a pun in the Akkadian proverb (page 246 in [41]) "minaa ana kipati takapap?" ("what will you bend in a circle?", where both "kipati" and "takapap" are derived from the same root "kpp" meaning to bend into an arch). In Greek, many words are derived from the root "kamp-" of the same meaning. It has been shown in [8] that the original autonym of the Sumerians was "kwep(e)ker", meaning "those who stretch the bow", the ancient word for "bow" being "kwep", the sketch of a bow used in CPS for the syllable "kwe". In Old Turkic, we have "küpe", meaning "a ring" and later "an earring". So, the word for "bow" was "ka(p)" in Indus. The bow (and arrow) was the most important weapon for the Old Altaic nations, indispensable for war, guarding in peace time, hunting, playing, and archery competitions. For the arrow, see under syllabogram "ti".
6. **kə**(r): Three mountains sign, in Indus "kə(r)", Turkic "qır", in Modern Turkish written "kır", Sumerian "kur", written  or  [42]. Sumerian "kur" meant "mountains; mountainous or wild land"; in Turkic, it means "mountainous or wild, uninhabited land". Given that Indus "ə" was pronounced exactly like Turkic "ı", Indus "kə(r)" corresponds exactly to Turkish "kır". Note that the sketch of three mountains is the origin of the Chinese sign 山 too (Chinese writing originates in ancient Altaic pictography).
7. **ki**: The word for spindle must have been "ki(l)", from a ProtoHuman root meaning "to revolve; spin, turn around"; the root is well known as "qel" in ProtoIndoEuropean (PIE), hence the important word "qeqlo-" (wheel: kyklo- in Greek, cakra in Sanskrit; the same is "gulong" in Filipino). Indus "ki(l)" is the origin of Sanskrit "kīlaka", meaning basically "a cylindrical stick". The humble spindle was a tool of paramount importance in ancient societies; no textiles or cord would exist without it.
8. **ko**: The word for conch is obviously related to Greek "konkhē, konkhos" and Sanskrit "śaṅkha". The root of the word, meaning "shell", goes back to ProtoHuman *C(A)QQ, and it can be found in every old language; notable cognates are "cacao" (originally meaning "a shell") from "kakaw(a)" from Nahuatl or a Mixe-Zoquean language and Nahuatl "cacahuatl" (a cacao bean). Greek "konkhē" and Sanskrit "śaṅkha" may be loanwords (from Indus!), but Greek has its own words from the same root: "kaukos" (shell, cup) and "kaukalon" (a shell of an animal like turtle or snail). So, we understand that the Indus word was "ko(k)". The conch shell was also an important object: since the most ancient times until today, conch shells are kept as sacred objects that bring good luck, and blowing the conch produces a sound that is believed to scare away all evil and bring rewards to the pious. Even one of the 4 main weapons of God is śaṅkha, a conch shell.
9. **ga**: The corresponding of the wheel sign in CPS and pre-Cuneiform is a simple cross within a circle; that means "sheep" in Mesopotamia and is used for "ca" in CPS, so its original name was "ga(n)" (meaning "sheep", found as "ganam" in Cuneiform; the same is "koñ" in Turkic); still, CPS (Minoan) users often interpreted the same sign as "ca(r)" (wheel, attested as "gigir", from reduplicated *ga(r)ga(r) in Cuneiform). That word was widespread in antiquity, as we have the Latin "carrus", Celtic "karros" (wheeled vehicle; according to the theory of monogenesis, all languages originate from one single language, and that is more obvious the more we look back in time, see [37]), so it is quite likely that "ga(r)" was the word for "wheel" in the IVC, so the wheel sign is to be read "ga". Note here that even in Indus, in very few inscriptions, the wheel sign has the shape of a simple cross within a circle, exactly as in Minoan. The sound "gar gar" represents a cart or the sound of carts' wheels in the mind of Greeks at least: even today, a mocking expression for wheeled vehicles or machines is "gargari". Among the sketches representing professions in the IVS is 22.  , where a man stands over two wheels (each wheel being a "ga" of the IVS), to denote the profession of a charioteer or cart driver.

10. **gə**: In [43], fish is "ku₆(d)"; the -d coda is very rare to appear, so we earlier considered that in those rare cases it was only the case suffix -da and not a -d (which is anyway not pronounced in Sumerian unless a vowel follows). The sign depicting a fish in Cuneiform is itself named ḪA, as it is used phonetically for the syllable "ḫa" (without any -d or anything else). Now, in CPS the <fish> sign is used for "cuo" (here "c" representing a tense palatal consonant, which came from a tense/emphatic palatal/velar consonant; both palatal and velar, when emphatic/tense, turned to tense palatal in Minoan Sumerian, while they turned to velar aspirated when non-emphatic/tense - see rule 5.0.7 in [32])]). So, we know that the original word for fish in old Sumerian was *gwo(d); "g" meaning the velar aspirated non-emphatic, which often turned to "ḫ" in Cuneiform Sumerian, hence the phonetic value "ḫa" (with "w" disappearing in Cuneiform and "o" turned to "a", see rule 5.0.2 in [32]). The -d coda of [43] is confirmed by Greek "gados" (cod fish); also confirmed by cases in IVS, where the <fish> is ligatured with the <upright> sign "də". That coda is not important anyway, as in Cuneiform Sumerian, Minoan Sumerian, and Indus too, the -d is generally not pronounced). The <fish> sign is used for "ko" in the Cypriot Greek syllabary (which does not distinguish between voiced / unvoiced or palatal / velar). All this made us think that <fish> is for "go" in IVL, but after lengthy study we concluded that it is "gə".
11. **gi**: The <reptile> sign, very common in IVS, was initially thought to be "mo" or "ni", because the corresponding <snake> sign is used for "ŋo" in CPS and for "no" in the Greek Cypriot syllabary. The ProtoHuman root *ŋ(o)h is well attested in many languages: Sumerian "ŋoš" (written MUŠ), Thai "ŋu", Tagalog "áha" (from *ŋáha?), Nahuatl "koa", Hebrew "nahas", and Sanskrit "naga" must be a loanword (possibly from IVL! where it could have been *naxa from an older *ŋaxa). After arduous examination, it was found that the IVS <reptile> sign is nothing like "mo" or "ni" and it is not to be connected with the ProtoHuman root *ŋ(o)h. The sign is found in positions where "gə" or "go" are found in other cases, and was finally determined that it was "gi". That surely does not come from the root *ŋ(o)h for snake, but probably from a root QQH(E)R that will be discussed below. Although some variants of the sign

86. 

point to a snake without legs, most variants:

87. 

point to a four-legged reptile. This means that the word naming the sign did not mean "snake" in particular, but more broadly "a reptile". Also note that the reptile is not depicted like e.g. a lurking crocodile, rather all the variants show a reptile that stood erect and ready to pounce. As Pierre Chantraine notes [44], the original Greek word for porcupine, "khēr", (and Latin "ēr" from *hēr) came from a PIE root *gh(e)r, found in the Sanskrit verb "harṣate", meaning "se raidir, se hérisser", a verb that describes precisely how porcupines or reptiles raise their body or spines or teeth and claws for defense or ready to attack. Therefore, although the root of Greek "ekhis; ekhīnos" (cognate to Sanskrit "ahi", Avestan "aži" = "snake") was also a candidate for the name of this sign, it is concluded that the word came from the old root "gher", so a reptile aroused was "gi(r)" in IVL, that lent its name to the syllabogram "gi".
12. **go**: The sign is quite familiar to those who are acquainted with early Cuneiform, and to us who have researched in depth the Minoan scripts. It is same as the sign used to write the usual Sumerian word for "big; great; grand", in Cuneiform usually "gal", less often appearing as "gula". The context of the words in Sumerian literature shows that "gal" meant "great, grand" in the sense of "important", while "gula" meant "big" in a physical sense. The study of the Minoan scripts revealed that "gal" was in fact "gəl" (with "c", i.e., palatal "g" in Minoan) while "gula" was pronounced "gula", as indicated by the Greek "nikuleon" (a variety of fig trees), borrowed from Sumerian ŋi(θ)cula "big tree". It was a good guess that the <great> sign was "gə" in IVL, but after long scrutiny we concluded that <great> was "go", the word being "go(l)". The Slavic word "golemo" ("grand") is not unrelated; it is either cognate to, or borrowed from, IVL or a closely related language.
13. **ta**: On most inscriptions, the sign is a sketch of female genitals, "ta(l)" in IVL; the old Sumerian form of this word was "tə(l)", in old Turkic "təş" hence "tışı" ("female", with the adjectivizing suffix -i). While "tə(l)" was the word in Minoan, Cuneiform Sumerian has the sign as "SAL" (after spirantization of "t"). Probably cognate to Greek "thēlu" ("female"). However, some IVL scribes prefer (probably for taboo reasons) another sign for "ta", which depicts a container, that is a vase, or bag, or sometimes specifically a quiver (arrow-case). The IVL word for "container" was "ta(g)", a word well known in Turkic as "tağar", borrowed in modern Greek as "tagari" (bag), but the Turkic "tağar" had a broader meaning, since it could mean most kinds of containers. In Sumerian, the word was "tug" (usually transcribed wrongly as "dug" from Cuneiform), a very common word; the exact form of "tug" is shown by Italian "zucca", where Sumerian "t"

(aspirated) was rendered, as precisely as possible, with Italian "z", and Sumerian "g" (unaspirated but emphatic) being equally well rendered with "cc" (in [8] it is explained that many Sumerians (Minoans) migrated to Sicily and south Italy when Crete was conquered by the Achaean Greeks).

14. **tə**: Rendered by the number <4>, which was *tə(r) in IVL. Arithmetic was the base of education in the IVC, as they had an advanced economy, which required, first of all, counting; secondly, it was necessary for the people to know how to read and write, and that was achieved by means of using that easy script, whereby each sign conveyed the name of the thing it depicted, so even the lowest caste, the "śudrās", knew reading and writing, since some of the extant seals belonged to "śudrās": the signs 19.  indicate persons who are not free, as if there is a heavy weight tied to their leg to prevent them from running away; this means they are "slaves" as we might call them today, or "śudrās" in Hindu terminology; but even they possessed seals inscribed with their name, their totemic animal or their personal deity. Numbers were very convenient for making the script easier: Indus people used simple syllables of the CV type for all numbers from 1 to 10, so they could count quickly: "sa ma pi tə li xi ja … wo" (we have not found the IVL names of the numbers <8> and <9>; these have not been seen in use as syllabograms) and numerical signs were the easiest way to write those simple syllables. So for the syllable "tə" the number <4> was used, its full name being "tər", which is related to Turkic "tört", itself related to the Turkic verb "törü-" meaning "to be completed or perfected; to be created"; the verb has a causative form "törüt-", translated "to create", but the original meaning was "to formally complete or make perfect"; an oracle of the "Irk Bitig" [39] says "a brave man's son joined the army in an expedition; in the battle field (after the victorious battle), an authorized messenger (of the king) 'törütméş'", which can be roughly translated as "proclaimed him a mature, perfected warrior"; and that was done by giving him a medal consisting of 4 parts, likely in the form of a cross, because the number <4> was always strongly associated in the Turkic mindset with the idea of completion, totality, perfection. Similar is the concept of "4" in native American (and African) cultures. For IndoEuropean (IE), the number <4> was considered most auspicious, as the word "qetwores" is probably related to the Turkic "kut" ("heavenly favor; happiness; good luck"). By the way, the Prajāpati in the so-called "Pashupati seal" or "Mahayogi seal" is depicted as tetracephalic (having four heads) and not tricephalic (having 3 heads); the head opposite the facing one is of course not visible in the relief.
15. **ti**: This is the most important of all signs as it appears in all types of Sumerian or related systems of writing, and it is this sign that first revealed that the language of Mesopotamian pictography was Sumerian, and also it is this sign that first revealed that the Minoan scripts were created by Sumerians. In Sumerian pictography, also in Cuneiform, in Cretan Hieroglyphic, in CPS (hence in Linear A and Linear B), in CyproMinoan and in the Cypriot Greek syllabary, in all those scripts the <arrow> sign is used for the syllable "ti". The Sumerian word for "arrow" appears to be "ti" in [43] and the <arrow> sign itself is named TI in Cuneiform, but in fact its full name was ti(l); we know this because the <arrow> sign is mostly used to write the word "ti(l)" meaning "life; living" (also another "ti(l)" meaning "ribs"), and sometimes the sign TI is used to write "tila", e.g., "nam-tilani" is often spelt NAM.TI.NI instead of the full spelling NAM.TI.LA.NI, because the sign TI was in fact known as "ti(l)", so it could be used for "tilə" with an understood epenthetic "ə". In recorded Turkic languages, the usual word for arrow is "ok" and not "ti(l)", but the old word "til" (arrow) has evolved into "tulum", meaning any kind of weapon; the Latin "telum" (thrown weapon) is not unrelated. By all available evidence, in IVS too, the <arrow> sign is used tor the syllable "ti".
16. **to**: The axe is "to(m)" in Sumerian. The root of this word is also widespread and durable, found as tem- and tom- in Greek, compare also the Amerindian "tomahawk". A form of "to" in IVL is essentially the same as "to" in CPS, but in IVS there are also different variants of the <axe> sign, which depicted different types of axe.
17. **da**: Cretan and Cypriot Minoan scripts used a <branch> sign for "da", the word being "da(l)", meaning a straight branch or beam; the word "dal" exists in Turkic languages until today. However, for the syllable "da" the IVS scribes preferred <thorn>, which also appears to be "da(l)" in Sumerian, and the IVS <thorn> sign is resembling the Minoan "da" <branch> sign, but the two signs are not identical.
18. **də**: The sign depicts an animal's (especially rhinoceros') strong horn standing vertically, to convey the idea of strongly standing upright. Until the end of July 2025, we were of the opinion that the word naming the upright horn is "də(n)", being the IVL form of Sumerian "di(ŋ)" (today read as "dim"), meaning "a mast of a ship; a vertical pole", coinciding with the Turkic "tiŋ", meaning something that stands vertically; still there is a Turkic word "tik" (Turkish "dik"), which also means something that stands vertically (often with a connotation of obstinate, unyielding, unwilling to collaborate, obstructing), and the same "tik-" is also a verb meaning "to set up vertically; to plant". Still these words, "tiŋ" and "tik", are always with "i" and we can find no reason why the corresponding IVL word would not also be with "i"; so it is more reasonable to conclude that the IVL word was not "də(n)" or "də(k)", but rather "də(r)", being the IVL form of the Turkic

"tur-" ("dur-" in Turkish, meaning "to stand"), as the IVL lost the original Altaic "u", turning it into "o" or "ə" as in this case. The Latin "dur(um)" could be a cognate, as the root that meant "standing" also had a connotation of being firm, unyielding, obstinate. The Semitic word for "wall" ("dūr-" in Akkadian, not unrelated to Turkish "duvar" which is from Persian but even in Persian it is a loanword from some Middle Eastern language) also carries the connotation of firmness and not only of standing.

19. **di**: The word di(k) is cognate to English "tick", which is a "recent" word but it has a very ancient origin: "external parasitic blood-sucking arachnid mite, Middle English *tike*, from Old English *ticia*, from West Germanic **tik*- (source also of Middle Dutch *teke*, Dutch *teek*, Old High German *zecho*, German *Zecke* "tick"), a word of unknown origin, perhaps from PIE **deigh*- "insect." French *tique* (mid-15c.), Italian *zecca* are Germanic loan-words." [45]. In the longest IVS inscription, it has the form:  . Compare to the photo from the Oxford Advanced English Dictionary: 

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20. **do**: All variants of this sign represent an "ear" of cereals; the sign is homomorph to one of the most famous Sumerian signs, named ŠE, usually taken to mean "barley", but in fact ŠE represented all cereals. Barley in particular was "do(b)" in Sumerian, judging from the Sumerian dialect of Crete, as the "do" of CPS represents an ear of barley. The other common cereals of the Sumerians (rather, of the whole Mediterranean) were wheat ("gig" in Cuneiform, it was originally "bəg", in view of Turkic "buğday") and emmer ("ziz" in Cuneiform, from the original "did", judging from CPS and Cypriot ProtoLinear using the <emmer> sign for "di"). The most common (and therefore cheapest) of cereals was barley (The Revelation of John informs us that wheat costed triple the price of barley at that time), and its name "do(b)" came from a root that meant "daily consumption", if we judge from the Greek root "dap-" of "dapt-" (eating up), "dardapt-" (intensive form of "dapt-"), "dapanē" (consumption), "deipnon" (dining), probably also "dorpos" ("meal"; the "r" being simply expressive, as in "dardapt-"). The IVS sign could represent some other kinds of cereals, which were the staple of life in Indus Valley, but the word for those cereals was the same "do(b)".
21. **na**: The word "na(l)" (the aquatic lotus and similar plants) is known from Sinhala: නෙළුම් *neḷum*, the name for *Nelumbo nucifera*. The "ḷ" in "neḷum", being retroflex, sounds like "r" to people who have no retroflex laterals in their native language; so Greek "nar-kissos" (a loanword from some oriental language) is essentially the same word "nar" or "naḷ" with a modifier (adjective).
22. **nə**: The homomorph of this sign was used for /ni/ in the CPS (Minoan Sumerian) and /ny/ in the Cypriot Minoan (Sumerian) language. CPS used two versions of "ni", one version representing <moon> and the other version representing <a lustrous bead, threaded>, as both <moon> and <lustrous bead> were named "ni(r)" in Cretan Sumerian, because the name for both of them came from the same root, meaning "lustre; light; appearance"; it is really impressive that the IVS too used the same two versions for the syllable "nə": one version representing <moon> and the other representing <bead>, both for the same syllable "nə". This is an overpowering indication that the IVL and Sumerian (including Minoan) not only were closely related languages, but also there was significant contact between the two nations. The root that gave "ni(r)" and "ny(r)" (meaning "moon" or "bead") in Minoan and "nə(r)" (same meanings) in IVL, is the same root that gave "yüz" (meaning "face") in Turkic; surely, "yüz" does not seem very close to "nir / nyr / nər", but keep in mind that Turkic "y" in the beginning of words never comes from a simple /j/; it usually comes either from /ð/ or /ɲ/ or /l/ or /ʎ/ or something like /ç/; in this case, "yüz" (face) comes from "ñer" ("ñ" used in transcription of Turkic for the palatal nasal), since the word is found in Chuvash as "nĕr" ('appearance, beauty'), and it was borrowed from old Turkic into Mongolian as "ni'ur / niğur". The Semitic "nur" (light) is also closely related; also, the Greek (IE) "oneiro-" ("dream"). As you see, this root gave the meanings: "moon", "light", "lustre", "lustrous bead", "face", "appearance", "beauty", a perfectly typical range of meanings for a ProtoHuman root; the original sense was something like "impressive appearance".
23. **ni**: The word for "egg", being the same as for "testicle", cognate to Sumerian "ŋu"; in Cypriot ProtoLinear script, the homomorph sign was used for "mu" (as known from the Cypriot Greek syllabary), an indication that the Cypriot Sumerian dialect had lost "ŋ" because of strong Emesal (feminine sociolect) influence. For different reasons, "ŋ" was lost in the IVL too, as also in most languages of the world. The emergence of "ö"

and “ü” in Turkic languages, including Sumerian (of Mesopotamia and Cyprus) is due to the influence of Emesal, but the IVL did not acquire “ö” and “ü”; on the contrary, it simplified the 6-vowel system of the original Altaic language into a 4-vowel system.

24. **no**: The coconut came from the Austronesian nation, where it was originally /ɲoɣ/, coinciding with a ProtoHuman word meaning “a fruit, usually big, with a hard or thick shell”. As even in the ProtoHuman language it has been observed that western populations tended to pronounce “r” in place of “s/z” and /ʁ/ in place of /x/ or /ɣ/, so also some Austronesian tribes called the coconut “ɲoɣ”, whereas other tribes called it “ɲoʁ” (today, some Austronesian languages have a name for the coconut with -g, whereas others have it with -r). In Sumerian (being an r-Altaic language), that ProtoHuman word has given “nur” (together with the determinative “MA” that indicated “fruit”), but that “nur” (pronounced “nor”) means “pomegranate” (that “nor” is obviously the origin of the Persian “nar” = pomegranate). In IVL (being a z-Altaic language), the same word must have been “no(x)”, meaning “coconut”, so the <coconut> sign was used for “no”.
25. **pa**: The thing than lent its name to the syllable “pa” is a leg, depicted mostly as an animal leg; it would be tempting to think that the word was “pad” (in such case, cognate to IE Greek pod-, Latin ped-, Sanskrit pad-), but the cognate to these IE words is the old Turkic “bud”, same as the Sumerian “bu(d)”, which has lent itself for the syllabogram “bu” in CPS, and the same was “bo(d)” in IVL, hence the syllabogram “bo”. That “bud” / “bod” and its IE cognates originally signified the thick part of the leg, mainly the thigh and buttock. There was another root, which is found in Greek as “pat-”, as a verb meaning “stepping”, and as a noun “place to step on; floor; ground”; this is the root that gave the name of the whole leg, “pa(t)” in IVL, hence the phonetic value “pa” of this sign. PIE had lost the distinction of “p” vs “b”, so the two roots seem to be similar, but as the old Altaic languages had kept a distinction between “p” (aspirate) vs “b” (non-aspirate, emphatic), the distinction between “bod” and “pat” was clear in IVL, “bod” signifying mainly the thick part of the leg, while “pat” signifying mainly the part of the foot that steps on the earth. To make the distinction visually clear, the IVS scribes preferred a dressed part of the human body for “bo”, in contrast to an animal leg for “pa”.
26. **pə**: A sign of immense cultural importance; this sign, along with the “double axe”, is the most typical symbol of the Minoan Civilization, and it is a great mystery if nobody has observed that the same sign is common in the IVS. In the CPS, the sign was used for “pete” (not a simple syllable of the CV type as the vast majority of the Minoan syllabograms), used for “pte” when rendering the Greek language in Linear B. The IVS had no syllabogram for any syllable bigger than CV, as the scribes sought to keep the writing system as simple as possible. The sign in IVS was named “pə(t)” and not “pete” (as the IVL had “ə” but not “e”), so it had to be used for the syllable “pə”. This sacred word meant “completeness; perfection; union of yin and yang; couple”. The same root has given a verb very common in Turkic, “bit-”, basically meaning “to complete”; in Basque, “bi” (in compounds “be-”), meaning “couple; number <2>”). The same root in IE has given the Greek “pant-” (“every; all; whole”). In Sumerian, that word sounded similar to the word for ears, so it was easy for them to see the sign as a couple of erect ears. The corresponding sign in Cuneiform is named PI. We could easily fill a whole page with details about this sign, so, to save space, the reader is advised to look for more details in [46], page 493.
27. **pi**: While the Minoan scripts use a <dagger> for “pi”, the IVS has no syllabogram of <dagger> or similar, rather it uses the sign for number <3>; the word for three was (approximately) /ɸiç/ in ProtoAltaic, to judge from Chuvash “viśśĕ”; common Turkic “üç”; Volga Bulgar “وچ (vᵉč)” and Sumerian “peš”. So, the IVL word for <three> was “pi(š)”, consequently the number <3> was used to write “pi”.
28. **po**: This sign is homomorph to the syllabogram “po” in all types of Minoan scripts (of the Aegean and Cyprus), where it represents the supports of the grapevine; the IVS type seems to be the support of another kind of vine, probably of melons, pumpkins and similar plants, rather than of a grapevine, that would make good sense if different plants were favoured in the Indus valley rather than the grapevine. But more than being homomorph to Minoan “po”, this sign amazingly seems to be homomorph to the letter (with) “p” in many other important writing systems, which are not unrelated to the IVS; that is, the Phoenician “p” (𐤐); even more, the ancient Greek “p” (Π π) was identical in shape to this (IVS “po”); the old Turkic (kök script) letter for V+p is also very similar (𐰽, in paper manuscripts written with right angle); The Kharosthi “p” (𐨨) is also very similar, while the Brahmi “p” (ᑫ) looks like this IVS syllabogram upside down. Some of these cases can be due to common origin, while some others can be due to coincidence, but sometimes symbols for similar sounds tend to be similar in scripts which are not visibly related, because there is some intuition in people, making them choose a certain shape for a certain sound. For example, the Cypriot Greek syllabary “ta” and “sa” are very similar to Japanese katakana “to” and “so” respectively, although nobody can speak of any physical contact between the two cultures that created these scripts. You may be really interested in this aspect or neglect it; still, the main fact about this IVS syllabogram is its being homomorph to the Minoan “po”, which was named after “po(s)” <grapevine>. The Sumerian pos+ten (grapevine+fruit juice = a grapevine for grape-juice or wine) gave “posten”, which is the origin of “bostan”, a word that

reached modern Turkish, Persian, Arabic, modern Greek, and neighbouring languages in the broader meaning "a garden with (grape)vines and other food-producing plants". It is also written in [47] that analogous to "pos+ten" was "sar+ten" ("sar" = vegetable garden, in place of "pos" = grapevine), so "sarten" meant a vegetable garden (especially with melons) grown for fruit juice, especially melon juice (not only consumed directly, but also thickened by slow boiling for preserving it into winter); this "sar+ten" was the origin of Sartana, the name of a Greek town in Crimaea.

29. **ba**(g): An Ancient Altaic word "ba(g)", meaning "crab", found in Turkic as -bağa, used in the names of small, usually shelled creatures like "frog" and "turtle".
30. **bə:** The usual word for "frog" in Cuneiform Sumerian is "wr. bi_2-za-za; na_4bi_2-za-za; bi_2-za-$zaku_6$; bil_2-za-za; bi-za-za; bil_2-za "frog; figurine of a frog""; that "bi-" was earlier "bə-", given that Cuneiform Sumerian "i" quite often comes from an earlier "ə" (phonetic rule 5.0.3 in [32]). The "zaza" (pronounced "θaθa" or "θəθə" in Sumerian) represents the monotonous repeated croak, characteristic of frogs. Just as in Sumerian, frog was "bə" in IVL, or perhaps "bə(l)". There is also impressive similarity to the Greek "batrakhos", also "bathrakos" and "botrakhos" (frog) and the Latin "botrax" (lizard); by reversing t-r we would have *bartakhos, which is close to Sumerian "bil_2-za-za". The connection of Greek "batrakhos" to Latin "botrax" indicates that the word had an originally wider meaning than "frog". We can be sure that in IVL too, the word "bə(θ?)" had a wide range of meanings: "salamander", "frog", "toad", and "lizard",
    As the scribes had a choice between <pudendum> and <case / container> for "ta", they also had a choice between <salamander> and <butterfly> for "bə". The word for <butterfly> in IVL was * bə(r), judging from Cuneiform Sumerian "giriš" (from *bər- according to phonetic rules 5.0.3 and 5.0.14 [32]). Even English "butterfly" has no reasonable connection to "butter"; rather, it has been a Wanderwort "bər" that entered English as "butter(fly)" through a false popular etymology.
    The sign 117 and 118 ([38]) has also been suspected as a variant of the <butterfly> sign, but it should be noticed that the sign (117 and 118 [38]) has a stem (typical of a <leaf>) which, if interpreted as a <tail>, the creature should be a salamander (frog and toad having no tail), but a salamander has a much more slender shape than the "plump" shape of the sign (117), which also lacks the top details indicating the facial features of an amphibian or butterfly. On these grounds, we hold that the signs for "bə" were 83 and 116 in [38], while 117 and 118 represented a <leaf>. The Sumerian word for "leaves" is unknown in [43]; in Turkic, "leaf" is "yaprak" from older "yapurğak", so we estimate that in Sumerian, and IVL, it would be "ja(p)". We have previously said that the Turkic "y-" is never from an old /j-/; still, an old /ç/ or similar sound could have evolved into /j-/ in both Turkic and IVL.
31. **bi**: From the word bi(n): Most variants of this sign are identical to the sign "bo" <ladder; staircase> of the Minoan scripts, so at first, we thought that this IVS sign is "bo". After lengthy examination, we concluded that it is "bi" and not "bo". The phonetic value "bi" fits even better the cognateness with the Turkic verb bin- "to ascend; to mount". Some forms of this IVS sign seem to indicate "upstairs" rather than "stairs".
32. **bo**: See above, in the comments about "pa" (25), for the distinction from "pa" <leg>, while "bo" is <the thick part of the leg, thighs and buttocks>. This sign is homomorph to the Minoan signs for "bu" and similar pre-Cuneiform Sumerian signs. The word is well known in Turkic until today as "bu(d)", hence borrowed into modern Greek as "buti" (thigh). For more details, see about "pa" above (25).
33. **ma**: The word for <two>, in Cuneiform Sumerian "min" (pronounced "me(n)", from older *ma(n)) was also "ma(n)" in IVL, hence the number <2> sign was used for the syllable "ma".
34. **mə**: This sign resembles the CPS sign "θu" <blanket>, but in fact it is a homomorph of the Cypriot Greek "mo", which in turn is a homomorph to the Cuneiform Sumerian sign that is formally named TUG_2 <cloth>, but the usual word for garment was "mu_4". TUG_2 is clearly cognate to the Turkic "tokı-" ("to weave"; -ı was the suffix to make a verb from a noun), and to Latin "toga"; on the other hand, "mu_4" is cognate to the Turkic "böz" (garment of good quality; m- had to become b- in Turkic). Clauson [48] estimated (probably wrongly) that "böz" ultimately derives from the Greek "bussos" (which in turn is borrowed from a Semitic language), but how can we know if it was not from an older Turkic *möz? Possibly there was also a variant *mez, hence the more recently attested "bez". Even the Semitic "buṣ" could be a borrowed word, or even a genuine Semitic, that was previously with m-, which turned to b- (a change that sometimes occurred in Sumerian and other languages too, although not so regularly as in Turkic). The meaning of TUG_2 was the product of weaving, but a garment was "mu_4". If the Turkic "böz" points to an older form of the word, then the Sumerian "mu_4" was pronounced "mö(r?)" ("ö" from old "e" in Sumerian, rule 5.0.4 [32]). In any case, the IVS sign "mə" representing <cloth> was homomorph to the Sumerian "mu_4" and to Cypriot Greek "mo".
35. **mi**: First note that the IVS scribes used numerical signs only up to number 5 for some syllables, but even numbers bigger than five, especially <seven> and <twelve> could be used alternatively for syllables typically written with signs representing objects. Since the first sightings of IVS inscriptions, we noticed that the number <12> is rather frequent and it could hardly be used for the name of number <12>, as the number <12> would be named "10 and 2" or even "2 and 10", anyway it would not have a monosyllabic name to be

used for a syllable; so, <12> did not stand for the name of the number <12>, unless if <12> was called "a year". At that time, we did not know the Sumerian word for "year", so we tended to think that the Sumerian word for "year" would be similar to the Turkic "yıl"; not a good guess: later on, we found that the only word for year was "wr. mu; mu-mu; mu-u_2; mu-u_3; mu-u_8" in Cuneiform Sumerian, likely from an older "mi" (phonetic rule 5.0.4 in [32]). The more common way to write "mi" was an upright rectangle, divided into equal rectangles (appearing usually to be 12 rectangles in the copies of Mahadevan [34], but in Parpola [38] we see divisions of the rectangle into various numbers of small equal rectangles). Division (into equal parts) or <equal parts> was exactly what the sign represented, named "mi(r)", cognate to the Greek "meros" (part), verb "meriz-" (dividing, distributing), and other words of the same root; it a well-known IE root, hence the Latin "mere-o" = to receive one's due part; the Hittite "mar-k-" = to divide and distribute a sacrificial victim.

36. **mo**: The sign for "mo" in CPS depicted essentially the same thing: a walking bird. The Cretan forms remind us more of an ostrich, while the IVS forms of "mo", really elegant and simple at the same time, point rather to a stork. All walking birds were called "mo(n)" in old Sumerian, as also in the IVL. There was a basic distinction of walking birds ("mon") versus flying birds ("gul") in old Sumerian, the same distinction found in Austronesian languages, where flying birds are "ibon" (in Tagalog), while walking birds are "manuk" (in all Austronesian languages). While Cuneiform Sumerian has "mušen" (-en from -an "sky", to signify "birds of the sky"), that "š" must be from "ñ", in view of the Austronesian "manuk".
37. **ja**: In the case of "ja", there is also an alternative way of writing the syllable with a number (namely <7>), but the more "formal" way to write "ja" was the sketch of a leaf (of ivy or similar), that was probably named "ja". See at the comments to "bə" (30) for the suggested etymology of "ja(p)" <leaf>. The more we ponder about it, the more it becomes clear that it was a leaf; given that numbers bigger than <5> were only alternative ways of representing syllables and not the main ways, there should have been an object representing "ja" and not only a number (that is <7>). The name of the number <7> in IVL must have been "ja(d)", cognate to the Turkic "yetti" (number names typically have geminate or rather emphatic consonants in old Turkic, so pointing to corresponding non-aspirate emphatic consonants in IVL). The name "yetti" of number <7> in our opinion derives from the root "yet-" meaning "to reach; to accomplish; to suffice", just as in modern Greek the word "arketa" (literally "sufficient") is used for amounts of about 7 things.
38. **jə**: The IVL word for aliaceous plants (like garlic and onion) was "jə(m)", cognate to Sumerian "šəm", which appears in Cuneiform as "wr. $šum_2$; $šum_2^{sar}$; SI; šum; $šum_2^{si\ sar}$; $u_2šum_2^{sar}$; $šum^{sar}$; $šum_2$-$šum_2$ "garlic; onion"", given that "ə" (that is, mostly /ɤ/ in Sumerian; /ɯ/ in IVL) is quite often perceived as "u" by people who do not have that "ə" in their own language. In other words, Sumerian "šəm" was transcribed as "šum" by Akkadians (in one case, you can also see a gloss "si" for the pronunciation). It is common through Altaic languages to have "j" alternating with "s" or "š" in related languages or in different periods. We could mention for example Sumerian "sar" ("to write") corresponding to Turkic "yaz-"; in Yakut, word-initial "y-" typically appears as "s-", e.g, the Yakut "süréh" vs common Turkic "yürek" ("heart"); the Yakut "sétté" vs common Turkic "yetti" (number <7>), and so on.
39. **jo**: This IVS sign represents a scorpion, which looks like three triangles as its body looks like one triangle while the claws look like the other two triangles. However, the symbol of the 3-triangles surely had a great esoteric significance, being a sacred symbol of God, just as the syllable "jo" was sacred in many ancient cultures. Also, the 3-triangles symbol was surely reminiscent of the three combined circles sacred symbol, which has been explained in [23]. As expected, syllabograms of "j-" often come after "-i". The word for scorpion is well known in Sumerian as "ljol"; it is distorted as "lul" in Cuneiform (probably that "lul" representing /ljo|/ at that time), but the original form "ljo(l)" is known because the scorpion sign (of a different shape than the IVS "jo") is used for "lio" in CPS. The original "lj-" was easily turned to "j-" in the IVL, a phonetic change common in many languages, for example, Hungarian and Spanish. Actually, it would be strange if "lj-" could be preserved as "lj-".
40. **ra**: The sign obviously represents a goat; we can be sure that it is a goat and not a different animal, because of its characteristic erect tail, which, for the pre-modern people, was a symbol of arrogance or superficial courage. A proverb of Greek Vlachs goes "kwada di edu" ("tail of goat") as an allegory for arrogant people. The word for goat must have been "ará(n)", cognate to Greek "arēn, arn-" ("lamb") and "arneios" (male sheep, sometimes described as a 3-year-old one). Even if the Indus people herded sheep as well, the goat was by far more common and more economically important, if we judge from the economics of modern India. Sheep's wool would not be so important for a nation that cultivated cotton, and goat's meat and milk could be preferred to the products of sheep in the warm climate of India. Even if animal's fat was precious, the usual meat for the Indus people was fish and poultry, as we will explain below at the syllabogram "wi" (50). As for sacrifices, they had many other kinds of domestic and wild animals, so the sheep would not be so important.
41. **rə**: All of the IVS syllabograms with r- had taken their name from words starting with a vowel before r-, as there were no words starting with -r; this is a phonetic rule in Turkic languages, which was inherited from

the ProtoHuman language. It is inconvenient for the human mouth to pronounce "r" without opening wide first, and opening the mouth would result in pronouncing a vowel before the "r". The IVL "rə" represents a flower (not of a specific species), exactly like the CPS "rə", which represented a flower (the crocus flower in particular, because that was of the greatest economic importance). Although there is no undisputed indication of a vowel starting the word for <flower> in Sumerian, because of the rule that no word could start with r-, we hold that the word was nor simply "rə(n)", but "ərə(n)" (with an epenthetic weak ə-), lending its name to the syllable "rə".

42. **ri**: This sign had two basic variant forms, one similar to "Λ" and one similar to "))", each variant having its own variant forms, as can be seen in the grid above and in the sign list of Parpola [38]. Again, it is amazing that both of these main variant forms exist in CPS (as documented in Linear-A inscriptions). The sign is common in the Cypriot Greek syllabic script, in the first variant only, used for the syllable "re". The same sign was common in Cuneiform and pre-Cuneiform as "RU" (pronounced "rö" at that time), in the form  (277_01 in LLATU list), but it could be found in different forms and different orientations too. The Turkic word related to it was the verb "ur-" ("to throw"). Although the throwing stick or boomerang is popularly thought to be an Australian invention, it was in fact popular in many ancient cultures, like of Egypt, Mesopotamia, and the Indus Valley.
43. **ro**: From the word (probably) "oró(b)", cognate to Sumerian "arabu" ("duck"); in [8], it was written that Sumerian "arabu" must have been "arob-", hence the Greek name Pēnelopē from Sumerian *bon-arob- ("neck of duck"). When the <duck> sign is in brackets, it probably stands for "rob".
44. **la**: On January 2025, the following was noted, on the ProtoLinear (Minoan) syllabogram for LA: For many years, Kenanidis was of the opinion that it depicts a jug or rather a churn. While working on the CyproMinoan script (December 2020 to March 2021), the "jug" theory was greatly doubted and since then it was thought that most likely LA depicted a boot; in such a case, it would be named "laḫ", which is known to mean "driving" (a vehicle or a vessel). The syllable "laḫ" is written with the Cuneiform sign DU, which depicts a leg (shank and foot) and is similar to CPS sign LA. Even the "boot" theory has some weak points: there is no proof that a boot was named la(ḫ), while the Cypriot types of the sign LA either have a very short "shank" (which is alright if the word meant "shoe" too), or, the "shank" line is quite oblique; always oblique in the Cypriot Greek syllabary. Indeed, the Cypriot Greek form of LA ***cannot*** be taken as depicting a boot or shoe, but it strongly suggests the image of a swan. All CyproMinoan forms of LA strongly suggest "swan" and not "boot" or "shoe". With this in mind, even the Cretan (Linear-A/B) forms of LA are faithful representations of "swan" and not of "boot" or "jug/churn" (actually, the jug/churn theory was based on an old publication in Kadmos, were the author suggested some relevance of the Cretan sign LA to a jug; if Kenanidis did not read that, he would never think that LA could have to do with a jug or similar vessel). Definitely, the Cretan and Cypriot forms of LA point to "swan" and no other object. Still, the swan theory needs a Sumerian name of the swan that would have given the phonetic value LA. In fact, the Sumerian word for "swan" was "la(g)", but the matter is not very clear today, because the word "la(g)" could refer, with some proper adjectives or in some specific context, to other birds considered similar, like a stork or a heron. The word was quite common in Akkadian, reduplicated as *laqlaqqu*. In turn, that was borrowed into Arabic as "laylak", hence Turkish "leylek" and Modern Greek "leleki", which means "a stork", but the original meaning of the word was properly "a swan". For Sumerians, living close to the big rivers and depending on the rivers for their living, a swan was much more familiar and culturally important than a stork. For Arabs, Turks, and Greeks, who were not familiar with big rivers and not much dependent on rivers, the stork was quite more familiar. The Akkadian *laqlaqqu* translates various Sumerian words: "za-ra-ah^{mušen} "stork, heron" Akk. *igirû; laqlaqqu*"; "wr. li-li-bi-sig^{mušen}; lib-lib-bi-sig^{mušen}; li-li-gi-sig$_7$-sig$_7^{mušen}$ supposedly meaning "stork""; "wr. la-ga "vulva" Akk. *gurištu; laqlaqqu*": in this case, the name of the bird was used for vulva; here note that in Greece, at least the northern area of Greece, "papi" or "papaki" (literally "duck" or "little duck") is the most common euphemism for vulva: the female organ is likened to an aquatic bird with legs in the water and so not visible. Obviously, a similar euphemism was used in Sumerian as "laga", which literally meant some bird similar to the duck, which again was "*laqlaqqu*" in Akkadian. Another word translated by Akkadian *laqlaqqu* was "wr. a-ra-ak^{mušen}; a-rak^{mušen}; a-rig$_2^{mušen}$ "a bird" Akk. *laqlaqqu*". We cannot say with certainty if that "arak" was only a variation of la(g)=swan. Still, "arak" with "arig" are variants reminiscent of the very common change of "a" to later "e" read in Cuneiform as "i". At the same time, the exact Sumerian word for "swan" is unknown in [43]: there is only a suspected "u$_5$-bi$_2^{mušen}$ =swan?", but that was probably a hoopoe, a word cognate to Greek "epop-s", Latin "upupa", and English "hoopoe", name inspired by the bird's call (voice). It would be really absurd if the Sumerian and Akkadian name of the swan did not appear in Cuneiform, while names for many other kinds of birds do appear, given that the swan was very familiar and very admired by Sumerians and all ancient nations. The Sumerian name for the swan was la(g), perhaps from la(b)? (b > g being a well-known phonetic tendency in Sumerian), and that was often reduplicated as

"laglag" (or "lablab"). Akkadian *laqlaqqu* is probably a loanword from Sumerian, unless both Sumerian "laglag" and Akkadian *laqlaqqu* derive from the same ProtoHuman root. This means that the Cretan and Cypriot syllabogram LA depicted a swan, named la(g) in Sumerian. This idea came timely so when we saw the IVS sign, representing a swan (and similar birds), we immediately understood that it stood for the syllable "la". All further scrutinizing the IVS corpus, could not give any indication that the sign could stand for some other syllable.

45. **lə**: This sign clearly represents <a hand>, although in various stylized forms. As <hand> is "no" in CPS, first we used to think that it stood for "na" or another syllable with "n-", but that could not fit any context in the corpus of inscriptions. Lastly, it was realized that the <hand> sign in IVS was named similar to the Turkic "elig" (hand); to be precise, it stood for "lə"; so, the IVL word for hand was "ələ" or "ələ(g)". The -g is doubtful, because, although it is found in old Turkic, some Turkic languages, including Ottoman Turkish, have "el" for "hand" and not "elig". If the word is also cognate to IE Greek root "(w)el-" ("to seize") or even to "ōlenē" ("forearm"), we have every reason to infer that the -g of Turkic "elig" was due to some suffix, not a part of the root.
46. **li**: The number <5> is used for "li" in IVS. The word was surely "lim", and when quickly counting, calling every number by a short syllable, it was pronounced simply "li" (given also the difficulty of IVL to pronounce a consonant without a following vowel). The word for <5> is "lima" (or very similar) across all Austronesian languages, from near the east coast of Africa up to near the west coast of South America. In very few, perhaps one or two, primitive Austronesian cultures, the word, approximately "lima", meant "hand", which was of course the original meaning of the word for "5". It seems funny that the same word in Sumerian, "limu" (wr. limmu$_2$; limmu$_5$; limmu; limmu$_4$; limmu$_x$(4(AŠ)); limmu$_x$(LIMMU^a); lamma; li-im-mu; lim$_2$-ma; lam-mu; limmu$_3$) meant "four"; there is a simple explanation: "limu" originally meant "a hand", or "the fingers of a hand" in Sumerian as well, but the Sumerians counted only 4 fingers in each hand, the thumb being a different thing, having only 2 phalanges, distant from the other fingers and pointing to a different direction. As to the ProtoHuman root that gave the word in Sumerian, Austronesian, and IVL, we are thinking of a relation with the Greek verb "la(m)b-" (to seize; take) and the similar Sanskrit "labh-".
47. **lo**: This is the phonetic value of the (both Cretan and Cypriot) Minoan <gazelle> sign, the word found in Cuneiform Sumerian as "lu" ("gazelle"), although Minoan and Cuneiform used different sketches for <gazelle>. The word is well known in ancient languages, "lo(x)" in IVL and in Sumerian, "luk" 鹿 in old Chinese, "elik" (roe deer) in Turkic, "alkē" in Greek (a loan from some Asian language), but also Greek elaph- "deer" and elakh- "light; little; nimble" come from the same ProtoHuman root. The Greek forms point to a PIE root *l(a)gh- ("laghu" = "light" in Sanskrit, "elakhy" = "light; little; nimble" in Greek), hence "elaph(os)" = "a deer" (being the light, nimble animal). Those who imagine IE laryngeals everywhere may find a laryngeal even in this word; there was no such thing. The initial vowel found in Turkic "elik", "alkē", Greek "elaph-" and "elakh-" indicates that the "l" here was originally retroflex, so a vowel was practical before it, to facilitate the pronunciation of the following retroflex, similarly to words starting with (V)r-.
48. **wa**: Exactly as in the Minoan scripts and in pre-Cuneiform, the sketch of <house> was used for "wa" in IVS too. The variants of this sign show what houses in the Indus Valley, similar to Sumerian houses in Mesopotamia, Cyprus and the Aegean, looked like. Those houses often had a storey above the ground floor and did not have the inclined roof that is typical of European houses, but only a level horizontal roof, sometimes with a chimney or a small covered structure on top. The inclined roof is, since old times, a characteristic of houses in areas with frequent or heavy snowfall; there, the houses need to have an inclined roof, so that the snow will quickly fall off. On the other hand, houses in areas with scarce or no snowfall, as in the southern Aegean, or Mesopotamia, or in the Indus Valley, it is more practical to build houses with a horizontal roof, as the inclined roof is not needed there.
49. **wə**: It is obvious that this sign represents the wall of a house (not a city wall). To the modern reader, that stone or brick or beam protruding out of the wall seems puzzling, it was puzzling for us too, until we noticed an old house in a city of northern Greece: like all houses of old, the ground floor has thick walls made of big stones of irregular shapes, but what is unusual to see today, the wall (facing the side of the house, not facing the road), has a few of the stones protruding, those are big, flat, with an horizontal surface, so it is practical to sit on them as if on a chair:  . In old times, such protruding stones could have various other uses too; for example, as there were big animals like oxen in the inhabited areas, such stones would prevent an animal from harmfully reaching the wall. Also, the protruding stone/brick seen in this syllabogram could

be an external window sill; also, what looks like a protruding block, can be the part of a beam that protrudes a little out of the wall, a usual feature in old architecture. The protruding stones or beams could have been an architectural device to enhance the stability of the building. In fact, that protruding thing in this sign was necessary to indicate that it represented a wall, because, if the protruding thing were missing, the sketch could be interpreted as a long piece of a broad bamboo cane. So, we can be sure that the sign represented a house wall. In Sumerian, "bad" is a frequent word for "wall", but that "bad" means a city wall, and not a house wall. The Turkish word "beden" (also borrowed into Modern Greek) is either a loanword, ultimately from Sumerian, or a cognate to Sumerian "bad" (city wall). "Beden" in the sense of "human body" is a different word borrowed from Arabic. The Sumerian word for "house wall" appears as "wr. iz-zi; i-zi; ^{ŋeš}i-zi; e_2-zi; iz; iz-zi-da; ^{ŋeš}ezem; ^{ŋeš}izi; i-izi; i_3-zi; ^{ŋeš}i^{t}-zi; ^{ŋeš} ^{i}izi "wall; side (of chair or bed)": given that "w" does not appear in Cuneiform Sumerian, where "z" was /θ/, the Sumerian was *wiθ, quite possibly from an older "wəθ" (phonetic rule 5.0.3 in [32]). It is uncertain whether the same root gave "wr. uzug; uzug^{u_2}-^{zug}; u_2-zu-ug; u_2-zu-uk-ka "enclosing wall; a shrine", which must be a cognate to the Turkic "otağ", which basically had the same meaning "enclosing wall"; this in turn is likely cognate to Latin "aedes" and Greek "aithousa". Exactly or approximately the same as in old Sumerian, the IVL word for "house wall" was "wə(θ)", hence the phonetic value "wə" of this sign.

50. **wi**: This sign is quite analogous to the Cuneiform and pre-Cuneiform sign "UZU" (meat; flesh; carcass; body), which is also used as a determinative for words referring to types of flesh eaten or body parts. That Mesopotamian Sumerian sign depicts the body of an animal butchered so that the ribs are evident, hanging from a peg. The same thing is depicted by the sign "wi" of CPS, while a drastically simplified Cypriot form of it is discussed in [49] (the reader may search with "LCGr Paphian u", given that the sign was used for /wy/ in the Cypriot Minoan script (phonetic rule 5.0.4 in [32])). The Sumerian forms of the <meat> sign all depict a butchered quadruped, especially a sheep. The Cuneiform word "uzu" represents /wy(θ)/ with a -/y/ to enable the coda consonant (-θ-) to be pronounced - unless "z" (/θ/) is due to a scribe's inaccuracy for /s/. In Cuneiform Sumerian, "z" could come from an earlier "d", while "s" from an earlier "t" (phonetic trait 5.0.31 in [32]), so we suspect that the original word was "wi(t)" rather than "wi(d)", in view of the Turkic "et" (meat); still, it is quite possible that even the Turkic "et" came from "wi(d)". A reason to explain why the Turkic word has "e" and not "i" may be that "it" means "a dog". For sure, the original Sumerian and Turkic word for <meat, flesh> was "wi(t)" or "wi(d)", as attested by the CPS syllabogram "wi". The IVS sign for "wi" <meat> obviously represents a slaughtered bird, e.g. a chicken or goose, hanging from its feet, neck downwards, head missing, because it has been slaughtered. This was the image that the word "meat" would instantly bring to the mind of an Indus person: "meat" in their language was typically "poultry". It is not different in India until our times: the usual meat in India is poultry. Of course, the Indus people would often eat fish too; the <fish>, being a frequent sign in their script, it was also frequent on their table. Not much different was the diet of the Austronesian people: the word for "meat" in the languages of Philippines is taken from Spanish ("karne"); apart from fish, their meat was usually poultry; flesh of pig or buffalo used to be in the menu about once a month. In mainland Greece too, cattle meat was almost unknown, and many people enjoyed quadruped meat only around Christmas (pig) and Easter (lamb). The area around the Black Sea was quite richer, but still we know a Pontic Greek traditional old couplet saying "pote tha erthi Keräki, pote tha erthi Savat! na paeno sin pethera-m, na qofti-me qosaran!" ("When will Sunday come, when will Saturday! So I may visit my mother-in-law, and she will slaughter a chicken for me!"). Even today, in almost all countries, what is the most iconic food on a table? It is chicken. In the Indus nation, animals would be sacrificed from time to time, on great celebrations or events, and the sacrificial meat would be distributed, first to the higher classes of course, and then to the common people of lower classes. It was an agricultural society, meaning that there were plenty of grains, legumes, vegetables, fruit, and dairy products, so it was easy for anyone to be vegetarian permanently or temporarily. Still, most people would daily have some kind of flesh on their table, and for them <meat> meant "poultry". This is why the word for <meat> would readily bring to their mind the image of the <slaughtered bird>, and the image of the <slaughtered bird> was readily interpreted as <meat>, that is "wi(t)", hence the phonetic value "wi" of this sign.
51. **wo**: This sign represents a pair of hands, in a stylized way, just as the sign for a single hand is found in stylized variants (see sign "lə" above: 45). At first, observing the positions where the sign occurs, it was noted that its phonetic value is "likely w-"; later it was concluded that it is "wo". A pair of hands was called "wo"; the word corresponds to Sumerian "wr. u_9; u "ten""; Turkic languages have "on" (Chuvash "vunnă"; Bulgar Turkic وان (van)") for "ten"; still there was another Turkic word *wo for "a ten", if we judge from the common Turkic "otuz" (number <30>), Chuvash "вăтăр (vătăr)", Bulgar Turkic "وطر (v^{u}t^{u}r)", forms pointing to *wo-tur, literally "ten-three", "tur" being cognate to Sumerian "tur" ("little; few"), IE "tri" ("three") and Austronesian "tulo/turo" ("three"). That "wo" originally meant "a pair of hands" (hence, number <10>), that is why "wo" is the phonetic value of the sign representing a pair of hands. The fact that there was an IVS sign for "wo", but no sign for "ji" or "je", confirms our original hypothesis that the IVL

did not have “e”, only “i”, and it had “o” but no “u”: because, if there were “e”, there would also be a sign for “je”, which has not been found; although there was no phonemic “u”, w+o was a possible combination. CPS had a sign for “wo” and another for “je”, although no “wu” or “ji”.

52. **xa**: The sign is an image of a cord wound around a spool. It could be of any material: yarn, wire, or even bowels of an animal wound around a spit for roasting etc. There is a Sumerian word “ḫaš” from a root meaning “to wind around / tie around”; the meaning of the root can be inferred from: “wr. gu$_2$-ḫaš "wire"”; “wr. gu$_2$-ḫaš; gu$_2$-ḫaš^{kug_babbar}; gu$_2$-ḫaš$^{kug_sig_{17}}$; gu$_2$-ḫaš^{zabar}; ^{uzu}gu$_2$-ḫaš "nape of the neck; cord; belt; braided hair"” (here the meaning “nape” is derived from “braided hair” that cover the nape, or perhaps from the collar that surrounds the neck); from “braided hair” is formed “wr. gu$_2$-ḫaš-la$_2$ "barber"”. The meaning “wr. ḫaš$_3$ "debt-slavery; distraint"” is derived from the original meaning of “tying around”, metaphorically making somebody a slave. The same idea is in “wr. ḫeš$_5$; ḫeš$_5^{še_3}$; LU$_2$-eš$_2$; ^{kuš}ḫeš$_5$; ^{še}ḫeš$_5$; ḫaš; LU$_2$.EŠ$_2^{t}$; LU$_2$×AŠ$_2$ "(to be) oppressed; (to be) detained; (to be) bound"” (here it seems that “a” turned mostly to “e”: see rule 5.0.3 in [32]). As a noun, “ḫaš$_2$” could mean “reins” (that is, strong cord that restrains): “wr. ḫaš$_2$ gid$_2$ "to pull the reins"”. With a reservation that “-š” could represent something similar (e.g., “-s”) in Cuneiform, the word “ḫa(š)” existed in IVL as well (where we write it as “xa(š)”), in the meaning “wind around, tie around; cord wound around a spool”. This gave the phonetic value “xa” to this IVS sign.
53. **xə**: In Sumerian, “wr. uḫ; uḫ^{ku_6}; uḫ$_3$ "turtle"”, the word that appears as “uḫ” could be “uḫu” (as no Sumerian word could end in a consonant without a following vowel), or it represents an older word *ḫug that turned into “uḫ”, because old Sumerian “ḫ” has in most cases disappeared in Cuneiform Sumerian, where “ḫ” usually comes from an older “g”. Even the “u” in “uḫ” may represent “ə”, because Akkadian scribes sometimes rendered Sumerian “ə” as “u”, especially when it was next to fricative/sibilant consonants. Anyway, the IVL had “ə” but no “u”. The word for “turtle” was “əxə” in IVL, or, much more likely, “xə(g)”, hence the sign was used for the syllable “xə”.
54. **xi**: Regarding culture, this is the most important symbol of the IVS, as it is the homomorph of the Minoan “double axe” sign, which stood for the Celestial God, named A(n) in Sumerian of Mesopotamia, the Aegean and Cyprus. The IVS is generally closer to the Cypriot Protolinear than to the CPS (Minoan scripts), and this is evident in the case of this sign too, which is quite similar, in some variants identical, to the CyproMinoan (and the Cypriot Greek syllabic) “a”, which stood for “A(n)” (the Celestial God). In the IVS, this sign was used for the syllable “xi”, the word being “xi(n)”. This “xin” is the IVL form of Sumerian “en”, meaning “lord”. Typically, the names of the most important Sumerian gods start with “en” (meaning “the Lord of wind/breath”; “the Lord of goodness” and so on). As observed already in 1992 [8], that Cuneiform “en” represents an original “*ḫen” (as old “ḫ” is scarcely preserved in Cuneiform Sumerian), and that “*ḫen” is the Sumerian form of the Turkic “xan” (usually written as “han”), which is probably the most famous Turkic word: everybody knows that it was a title of Turk (and then Mongolian and other nations’) rulers. In a Turkic state, the supreme ruler was a “xağan”, which is an ancient derivative of “xan”, meaning “a great ‘xan’, the supreme ‘xan’”. We wish that sir G. Clauson [48] lived today to know that “xan” is a 100% genuine Turkic word and not a loanword as he has written (without giving any suggestion for the word’s possible origin). Now you may ask, why Sumerian has it with “e” (*ḫen), while Turkic has it with “a” (xan); the answer is obvious if you know that Turkic words with velar consonants (as “x”) could not have front vowels (as “e”) but only back vowels (as “a”). The original form was “xen”, which turned into “xan” in Turkic, because of the velar consonant; the same “xen” turned into “xin” in IVL, because the IVL had no “e”, as often noted above. We have also noted that the IVL form “xin-ra” (“for the Celestial God”) was the origin of Sanskrit “Indra”. There is one more amazing thing about this letter “xi”, which often had a simplified shape similar to “X”: it could have been the origin of the Greek letter “X” (“khi”). Greek “X”, together with “Φ” (phi) and “Ψ” (psi) are the only letters of the Greek alphabet which came not from the Phoenician alphabet, and nobody so far could give any suggestion for the possible origin of these 3 letters, which are as old as the Greek alphabet itself: X and Φ are found in the two oldest Greek alphabetic inscriptions (the Dipylon inscription and the Nestor’s cup), while Ψ (originally written ) was initially a variant of X (“khi”). These 3 letters (X, Φ, Ψ) could originate in a late form of the IVS: this would mean that although the IVS had disappeared in India, there was still at least one small community, descending from the Indus nation, which persisted until the 8th century BCE, and that community came into contact with the Greeks of that time. Where was that remnant of the Indus nation living, it is hard to say; but, just as Greek scholars migrated to Italy and other western European countries after the conquest of Byzantium by the Ottoman Turks, in a similar manner some erudite people from Indus Valley could have migrated to the West, even up to the Aegean Sea, after the conquest of the Indus Valley by the IndoEuropeans.
55. **xo**: This sign represents a ploughshare; this is clear if we compare images of the ploughshare in ancient Mesopotamian and even Egyptian writing and art. It is interesting to notice that more often than not, the sign depicts the ploughshare as ending in 3 (or sometimes more) “prongs”. Could the actual ploughshare end in 3 or more prongs? - Reasonably not: if the ploughshare ended in 3 prongs or more, those prongs would thrust

into the earth when the plough was pulled and would be fixed in the earth so strongly that the animals could not pull the plough, or the prongs would be broken. Obviously, what looks like “prongs” at the end of the ploughshare is the syllabogram “o” <horn>, ligatured with the <ploughshare> sign. As the <ploughshare> was “xo”, ligature with <horn> means “xo+o”; so this ligature was useful to show that the sign ended in “-o”, and that was a long “o” (-ō). Why was that useful to show? Because the script tried its best to be explicit, while the reader could easily confuse “plough” with “ploughshare”. For that the reason, the “plough” syllabogram (“ə”) almost never includes the <ploughshare> in the image of <plough>, and the <ploughshare> (“xo”) usually is joined with an “o” to make sure that the reader reads “xo” and not “ə”. As to the etymology of “xo(p)” (ploughshare), it is cognate to Sumerian “wr. apin; ^{ŋeš}apin; a-pil; ^{ŋeš} ^{a}-pi-^{in}apin "(seed) plow"”, should we remind again that old “ḫ” usually does not appear in Cuneiform Sumerian, so that “apin” was originally *ḫap- with a suffix (“-in”) indicating an instrument; even the “a” in *ḫap- could be from an older “o” (rule 5.0.2 in [32]). An IE cognate is the Greek “skaph-” (“to dig”), with an IE verbal prefix s-, originally *s-xaph that turned into “skaph-”, because it was too difficult to pronounce *sxaph-.

56. **ša**: The rhombus image as a sign meaning “good, sweet” etc. is well known in Sumerian, where the word appears as “wr. sag$_9$; sag$_8$; sag$_{10}$; sag$_9$-sag$_9$; sa$_7$; sa; sag$_3$; sig$_{15}^{v}$; sa$_7$-ga; sa$_7$-sa$_7$; šeg$_{10}$; sa$_3$; sa$_7$-ge; sa$_7$-gen$_7$; sa$_7^{sa}$; sig$_9$; sig$_x$(ERIN$_2$); zag; sa-sa; sag; sa$_2$-sa$_2$; ^{sa}-^{a}sag$_9$; ^{sa}-^{a}sa$_7$; ^{sa}sa$_7$; ^{si_3}-^{ga}sag$_9$; ša; sag$_3$-sag$_3$; sa$_3$-ge; sig "(to be) good, sweet, beautiful; (to be) favorable (of an omen); to make good, improve; to approve (the quality of something); to prepare (meat); goodness, good (thing)"”: the impressively great number of ways to write this word shows that it was a very common word, used both in colloquial and in formal speech. In Cuneiform it appears mostly with “s”, sometimes with “š”, which was the original. It is a case of Sumerian “s-” corresponding to Turkic (and Minoan) /j-/, like, for example, the Sumerian “sar” (“to write”) corresponding to Turkic “yaz-” (phonetic rule 5.0.26 in [32]); Minoan “ja” (bundle) corresponding to Cuneiform Sumerian “sa”. Such cases are many and point to an original /ç/ that turned to /j/ in one language and to /ɐ/ then /s/ in another. In the case of the IVL “šag” (“good, sweet” etc.), the original root was /çaɟ/, as we may understand from the Sumerian forms and the cognate Turkic “yég” (“better”), also the PIE root /jaɟ/, a very famous root, the origin of Persian “yaz-” (“to sacrifice; worship”); Sanskrit “yaj-” (“sacrifice; perform rites for purification and improvement; worship”) and the Greek “hag-” which preserves the original meanings of goodness, doing good, propitiation, auspiciousness, holiness. The Turkic “yég” has “é” (that is, a long /e/) instead of “a”, because the palatal “g” requires a front vowel. As to how the rhombus shape referred to “goodness”, we have explained earlier that the rhombus was the typical shape of a beehive (page 23 in [28]); of course, the shape consisting of interlocking or joined V and Λ or an upward and a downward triangle has an important esoteric significance in many cultures; notably in India the two opposite interlocking triangles is a sacred “yantra” explained as symbolizing the union of “Śiva” and “Śakti”.
57. **šə** / šə(s): The circular (or oval) sign is the same as the Sumerian sign meaning a large round number (a square number in mathematical terms), which, for Sumerians, was 60x60=3600; for Turkic nations, the large round number was 10x10=100, but the word was the same: “šar” for Sumerians, “šĕr” in Chuvash, “جُور (čŭr)” in Bulgar Turkic and “yüz” in common Turkic. In IVL, the word was *šəs (meaning probably “a hundred” rather than “3600”), so the round (or oval) sign was used phonetically for the syllable “šə”, also frequent in ligatures to denote -š.
58. **ši**: The word for “chain” was “ši(r)” in IVL; in Cuneiform Sumerian, the usual word for chain is found as “wr. šir$_3$-šir$_3$; ^{kuš}šir$_3$-šir$_3$; ^{urud}šir$_3$-šir$_3$; ^{ŋeš}šir$_3$-šir$_3$ "chain"”; the word was so common that it was borrowed into Akkadian as “*šeršerru*”. Expressive reduplication of “šir” in Sumerian is obviously due to the fact that a chain consists of repeated links. An IE cognate is the Greek “eir-” (“to tie one thing next to the other in a proper order”) from an IE root *jeir-.
59. **šo**: The sign represents an old loom; looms in antiquity were vertical, as we know from ancient Greek literature and art. A modern reconstruction of an ancient Greek loom can be seen in Image 1 [50] below. It is quite similar to the IVS <loom> syllabogram variants. The word for <loom> was derived from an ancient Altaic root, which appears in Cuneiform Sumerian as “šid” (that was pronounced “šet”, from an older “šat”); the same appears in Turkic as “çat-”, a verb with many derivatives, meaning “to interweave; weave; set things across each other”. This is in fact the original verb for “weaving”; as to Turkic “tokı-” (“to weave”), it is a derivative of “*tok”, which is the Turkic form of the Sumerian “tug$_2$” (cloth), related to Latin “toga”, so “tokı-” really meant “to produce cloth”. This verb is hard to find in [43]; however, Sollberger [51] notices that reeds (“gi”) in Sumerian were classified basically as “gi-šid” (reeds for construction, see “çatma” below) or “gi-izi” (reeds for fire, i.e., as fuel). As in the land Sumer stone was a rare material, all construction was done with clay plus hay and reeds. The product of the Turkic verb “çat-” is “çatma”. If you now search the internet with “çatma”, you will only find many pages about luxurious and precious textiles, woven by the Ottoman Turks since centuries ago, because yes, “çatma” was strongly connected to the meaning of “weaving”. However, for the elder inhabitants of Greek cities and villages, where some old buildings are still standing in spite of the overwhelming use of concrete, “çatma” (borrowed into Greek as “tsatmas”)

brings to mind one thing only: the material used in older times for all light construction. Indeed, until around 1930 CE, all houses used to be built with thick, heavy stone walls for the ground floor, but with "çatma" for the upper floors; that "çatma" was typically two layers of interwoven reeds, with air in between, covered with plaster. The technique is known in English as "wattle and daub". There are many photos of it, as in Image 2 [52] (although those photos represent a modern imitation, not so tightly woven reeds as traditionally). The "gi-šid" of the Sumerians were not different from the "çatma" of those old Greek houses, built with the so-called "Turkish" technique. The common Turkic "ç" corresponds to Sumerian "š" (rule 5.0.22 in [32]). In IVL, it appears as "š". The Turkic "çat-" corresponds to the IVL "šo(t)", meaning "to weave" (as a verb) and "a loom" (as a noun), hence the phonetic value "šo" of the <loom> sign.

Image 1

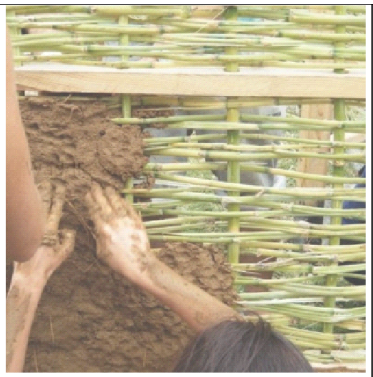


Image 2

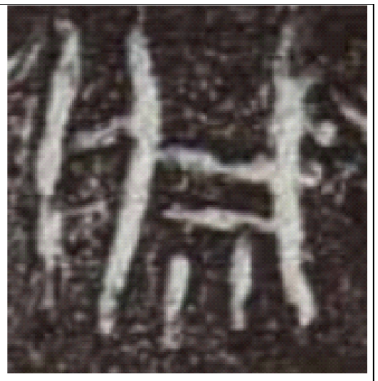
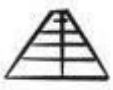


Image 3

60. **sa**: The word for <1> was "asá" in IVL; also "asa" in Sumerian, written as "aš", since no "s" appears at the end of a Sumerian word; all -s were represented as -š (again remember that every Sumerian consonant at the end of a word could not be pronounced, unless followed by a vowel); cognates are: Tagalog " isá"; Bicol and other Filipino languages have "saró" which appears to be cognate with Latin "solus", possibly indicating a derivative of "(a)sa" showing that the a- was only epenthetic so it could be omitted. Modern "ace" is surely a cognate, ultimately from the Latin "as" of Etruscan origin (Etruscan is a language of Asian character, either related to the Anatolian family [53] or possibly to Sumerian). We have previously stated that IVL numbers were pronounced as simple CV syllables when quickly counting: "sa ma pi tə li xi ja … … wo", and, since counting was important in the IVC with an advanced economy, small numbers were the ideal way to represent syllables too. The <one> sign in ligatures was used to show that the syllable ended in -s (corresponding to the common Turkic -z). In the case of the letter "šo", the ligatured "sa" appears on the left of "šo", joined to it with a little line (Image 3 above).
61. **sə**: This is an extremely important word meaning "metal", the sign representing an ingot. Essentially homomorph is the sign representing an ingot in CPS (sign "qu", Linear-B *47) and in the Cypriot Greek syllabary (sign "ku"), the difference being that the Minoan <ingot> signs have a vertical prop in the middle, which is lacking in the IVS sign, because if the IVS sign had that vertical prop, it could be confused with the <double axe> sign "xi". While the Mesopotamian and Minoan word for metals was "ku(g)", or perhaps "ku(b)", attested also in Turkic "kü-miş" (silver), the IVL word for metal was "sə", and that "sə" is not at all unfamiliar in the eastern Mediterranean: already in 1992 [8], it was noticed that there was a word "si" meaning "metal", and especially "iron". That "si" can be found in words like: Sumerian "si-mug" (blacksmith; metalworker); "si-par" (copper); Greek (loanwords) "si-dēros" (iron), "si-gunon" ("a type of iron", in practice: "a kind of dagger"); German Zink (hence English "zinc"). The Greek "sigunon" originates in a Sumerian word, appearing as "sugan" in Cuneiform; that "sugan" represents "sygən" (or "sü-gın", to use Turkish orthography), which came from "sigun", according to common phonetic rules (5.0.2 and 5.0.4 in [32]). In some older books, that "sugan" was suspected to be antimony, which is impossible, as antimony is well known to be "šembi" in Cuneiform Sumerian. In fact, "sugan" (older "sigun") was iron; the word "si-gun" gave not only the ancient Greek "sigunon"; it has also given a word "tsugún", which means "cast iron" in Russian and neighbouring languages. We have not found that "tsugún" in Russian-English Google translation, but we know it well from Russian speaking people. Meanwhile, "tsugún" means "iron cooking pot" in the Greek dialect of Ukraine ("Mariupolitan Greek"). A form of "tsugún", namely "цюгюн", is found in Kyrgyz, translated by Google as "iron", although Kyrgyz is a Turkic language, where "iron" is properly "темир" ("temir", same as in all Turkic languages). Moreover, "sigun" has given the word for "gypsy" (Romani person) in many languages, like the Russian "цыган", Greek "tsigan-", etc. Also, the Greek "tsigun-

" previously meant "gypsy", then it has taken the meaning of "miser". That is because in Greece and and all other countries where Romani people were living, all blacksmiths were Romani people; the concept of iron was inseparable from the concept of Romani people (who were "untouchables" of northern India, previously inhabiting the area about the Indus Valley, then roaming westwards). A false etymology has made the Greek word "athinganoi", literally "untouchables" from "tsiganoi". For many years (since 1992 [8]), there has been a quest for ProtoDravidian words for metals, expecting to find that "si-" (iron or metal) in ProtoDravidian, but nothing was found close to it [54]. The word "si" for metals, and especially iron, has nothing to do with the Dravidians; it was thought that the word "si" for metals came from a people who lived in the East Mediterranean before the Sumerians; later it was thought that "si" was a Sumerian word that came from "de-" through spirantization, "de-" being inferred from Sumerian words like "tibira" (metalworker), "dinig" (furnace), and Turkic "temir" (iron). However, if a Sumerian "de" was spirantized, it would result to "ze" (/θe/) and not "si"; also, that "si" coexisted with native Sumerian words for metals and metallurgy, so, in all likelihood, "si" was a Sumerian word of non-Sumerian origin; not of ancient Egyptian origin, as the Egyptian word for "iron" or "hard, dense metal" was "bia". What was the highly civilized nation near the Sumerians, where the word "si" for metal originated? The most reasonable answer is that it was the IVL word "sə", which became "si" in Sumerian (phonetic rule 5.0.3 in [32]). According to the Encyclopedia Britannica, there is only one native IE word for metal, namely "hes" (hence the Latin "aes" = brass), but even that is a loanword from some ancient z-Altaic language, in view of Turkic "yez"; that "yez" is found in some Turkic languages today: in some languages with "y-" and in others with "ç-". Also, it was borrowed into Mongolian in old times, today the standard Mongolian word for copper being "ces" [48] (Google gives: copper = зэс (zes)); it was also borrowed from some r-Turkic language into Mordvin (FinnoUgric language) as "śerä". All this means that the word was */çez/ in Ancient Altaic, and that could easily become "sez" or similar in some descendant languages, why not in the IVL, where it would be "sə(s)", as the IVL had no "e". The same would result in *se(r) in Mesopotamian Sumerian. However, that Sumerian "si", ("metal; iron"), does not seem to be *se(r) from */çer/, as it was taken in other languages as "si", not "se", and there is no indication for -r. So, that Sumerian "si" (metal, especially iron) must have been a loanword from the IVL "sə" (a cognate to Turkic "yez").

62. **si**: This sign is impressive because it is practically identical to CPS and CyproMinoan "si", in both written form and phonetic value. The sign depicted an animal's hide, stretched on a frame for processing into leather. In pre-Cuneiform the homomorphs are ZU / SU_2  and SU  (pronounced /sy/, phonetic rule 5.0.4 in [32]).
63. **so**: This sign is also impressive because it is homomorph to the CyproMinoan (and Cypriot Greek syllabary) sign for "so". It is also homomorph to the pre-Cuneiform sign named SAR, representing a vegetable garden (plants over an irrigation ditch). In the Cypriot Sumerian dialect, the word was not "sar" but "so(r)", hence the phonetic value of the sign in CyproMinoan script. In contrast, the CPS (Minoan) used a different sign, depicting a human <head>, for the syllable "so". As noted previously in several instances, the IVS is closer to the Cypriot Minoan script than to the CPS, although the difference between CPS and Cypriot Minoan is not big. Just as the word for vegetable garden was "so(r)" in Cypriot Sumerian, it was also "so(r)" in IVL where the sign was used for "so". Possibly, the word was "so(r)" in early Mesopotamian Sumerian too, as the attested Cuneiform "sar" may come from "sor" (according to rule 5.0.2 in [32]). In Cuneiform, the sign "sar" is used as a determinative for writing the names of all vegetables.
64. **θa**: An image of brickwork; "brick" and "brickwork" was "θe(g)" in Mesopotamian Sumerian, probably from an older "θa(g)", because of the phonetic rule 5.0.3 in [32]. That "θe(g)" is not easy to find in Cuneiform; normally, "θ" appears as "z" in Cuneiform, but many scribes were not accurate in rendering the sounds in Cuneiform, and our knowledge of Cuneiform today is not accurate at all. An ancient scribe's inaccurate or faulty rendering often misleads modern scholars to give a faulty name or reading to a sign. In this case, "brick" appears in [43] as "wr. $šeg_{12}$; $^{na4}šeg_{12}$; $šeg_{12}$-$šeg_{12}$; si; sig_{10}; ^{še}-$^{eg}šeg_{12}$; $šeg_{12}$-ga-lu-ra": this means that because one scribe glossed the <brick> sign with "^{še}-^{eg}", the dictionary [43] considers that the logogram for <brick> is to be read "$šeg_{12}$". Still, when the word for brick was written phonetically (instead of logographically), it was written in different ways, like "si" and "sig_{10}", and not with "š". On the "brick" page of the dictionary [55], there is another reading "sig_4" of the <brick> logogram, which was the standard reading earlier (before the [43] listing), and it is closer to the true pronunciation ("θe(g)"). The root of "θe(g)" (older "θa(g)") is cognate to PIE *dh(e)ig, hence the Greek "thig-, thi[n]g[an]-" (to touch with the hands), Latin "fingo" (to form, shape with the hands, e.g., working with clay), hence "figura" (form, shape); this cognate root confirms the Altaic /θ/, which mostly corresponds to IE "dh". So, the IVL word for "brick" and "brickwork" was "θa(g)", giving the phonetic value "θa" to the sign.

65. **θə** : The word was θə(k): "a house gecko". While the "di(k)" (sign 19) was considered a harmful creature, the "θə(k)" was beloved. In Asia (up to even Greece) there is an ancient tradition that the gecko means good luck for the house, and if a house has no gecko, the inhabitant is a bad person. In the Philippines, people also say that every day, before sunset, the gecko kisses the earth as a sign of devoutness, so setting an example for people to pray. The word for gecko is "butike" in Tagalog, but more conservative languages of the Philippines, like Bicol, have it as "teke". That "teke" or "tike" is cognate to the IVL θə(k). Philippines languages have no "θ".
66. **θi**: Another sacred sign in the IVC, used as a syllabogram. In fact, it is a variation of the holy cross, which was often used in Indus seals, in the form of a "Greek cross" or a swastika (which is also sacred in Hinduism and many other ancient cultures). The cross was a holy symbol even for millennia before Christianity. Even more amazing is the IVL name for this symbol, used for the syllable "θi": the word, in our opinion, was "θi(s)", cognate and almost identical to the Greek root "thes" hence "theos" (god). Although the stem of the word "theos" has no "s", because in early times "s" turned to "h", which then disappeared (i.e., *thes-os, then *thehos, then "theos"), the -s of the root "thes" is well attested in compound words like "thesphaton", "theskelon", "thespesion".
67. **θo**: Clearly this sign depicted a written document, which, in those times, was usually a clay tablet, as in Sumerian Mesopotamian and Minoan cultures. In IVC, it is quite possible that they also used "pages" made of palm leaves, as later in India. This sign is homomorph to the sign for "written tablet" in pre-Cuneiform and Cuneiform. Some forms of the Indus <tablet> sign have neat horizontal lines: 277.  while others appear blank: 278.  . This again confirms that the IVS was written in horizontal lines, just like the Minoan tablets (and not in vertical columns, like old Chinese or Sumerian pictography). Even Sumerian Cuneiform was to be read in vertical columns, and it is a blunder of modern scholars when they present the Sumerian Mesopotamian tablets so rotated as to appear with horizontal lines; all immovable written documents of Mesopotamian Sumerian (e.g., statues) are clearly written and read in vertical columns. In contrast, IVS was used in horizontal lines, like the Minoan tablets. One logographic IVS sign represents a scribe, holding a long text with many lines: 24.  ; this long text was obviously written on palm leaves, sewn together, and not on clay. The word for <writing tablet> in Sumerian was "dub", that is "dop", a word cognate to Turkic "toprak" (dry soil; dry earth), and to IE Greek "topos" (dry land; land, as contrasted to sea / lake / mire etc.), because the Sumerian "dub" (writing tablet) was only a piece of dried earth (clay). The Greek "topos" (of no known IE etymology) could be another loanword from some old Altaic language. Also, the "dap-" of Greek "dapedon" (ground) has no plausible IE etymology: some suggest *da- = "earth" (which is unattested), some think of *dia- = "through" (*diapedon unattested and it could not normally evolve to "dapedon"), and a third suggestion is from the root "dem" (to construct, build), which is unfitting in every aspect. It may well be a cognate to Altaic "dop" (dry land, as opposed to wet areas). The IVL "θo" seems to be the same word as Sumerian "dop", with "d" turned to "θ" through spirantization; still we have a little suspicion that there could be some influence from another word, perhaps *θo(r), which meant "blanket" in Sumerian ("zur") and in old Turkic (attested as "yorğan" from *ðor-). Another suspicion has been a hypothetical word *ðop for "leaf", which would be very close semantically to "writing document" in IVL, but that *ðop would be cognate to the Turkic "yapurğak", which has been shown at the sign "ja" (37) that it comes not from ð-. So, the most plausible explanation for the word is *θo(p), a spirantized form of "dop" (dry earth, dry clay, writing tablet), as that was originally the main writing material of the Indus people, just as of Mesopotamian and Minoan Sumerians. For long texts (books), palm leaves sewn together would be preferable as they require less space for storage, but for short texts, up to a couple of pages, clay tablets were much more practical, and they had the advantage that they could be fired and so preserved for ages.

V. CONCLUSION

As exemplified so far, the study herein presented evidence that the IVL can be an Altaic one of the eastern group (z-Altaic), related to its contemporary Sumerian, the latter being an r-Altaic language (western group). The IVS is a syllabary of 67 main signs that comprise 80% of the IVS corpus, similar in image, and sometimes similar in phonetic values, to the signs of the Minoan scripts of Crete (CPS) and Cyprus, also with many analogies when compared to pre-Cuneiform Sumerian. The phonetic value conveyed by every sign has been discussed in details, while the syllabograms have been arranged in a typical grid. A commentary on the extended signary (variants,

signs with diacritics, ligatures and logograms) of the IVS, comprising the rest 20% of the IVS corpus, will be also presented shortly.

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