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Enquiring the pre-writing and proto-writing of Europe

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Abstract
Scholars remain divided over the nature of early Eurasian symbol systems, particularly those associated with the Neolithic Balkans. Proposed frameworks, such as Marija Gimbutas' "Old European Script" and Harald Haarmann's "Danube Script", suggest these markings constituted functional, ritualistic, or early linguistic notation systems that predated Mesopotamian cuneiform. Conversely, significant counter-arguments challenge the existence of a true script within these traditions. Addressing this debate, this study investigates the broader phenomenon of pre-writing and proto-writing across Eurasia. It presents existing methodologies and archaeological discoveries to enquire whether unclassified symbol assemblages can meet the formal definitions of writing.

Keywords: Danube Script, Old European Script, proto-writing, Eurasian Symbol Systems, graphemic analysis, semasiology

Introduction

According to the mainstream views on the history of writing as expressed by S.R. Fischer [1], the Afro-Asiatic region represents one of the few places in antiquity where writing systems developed endogenously, independent of external influence. While writing frequently served sacerdotal or elite propaganda functions across other cultures, often adopted via cultural diffusion to consolidate political prestige, the scripts of the ancient Near East and Indus Valley originated primarily from utilitarian administrative and accounting demands. The earliest antecedents of phonetic writing can be traced to the 9th millennium BCE in Mesopotamia, where agricultural communities utilized geometric clay tokens (e.g., spheres, disks, and cones) for commodity tallying. Following the Sumerian integration into this region, these accounting mechanisms were expanded to include complex token shapes and stylus impressions capable of recording nuanced economic transactions involving agricultural yields, livestock, and real estate. The transition toward a fully graphic script accelerated with the development of hollow clay envelopes (bullae), which enclosed the transaction tokens. To identify the contents without breaking the container, administrators began impressing the tokens onto the exterior surface of the envelope before sealing it. This practice rendered the internal physical tokens redundant, giving rise to flattened clay tablets where two-dimensional impressions alone conveyed both quantity and commodity type. By the 2nd millennium BCE, the region also became the locus for early alphabetic development. Evidence of Proto-Canaanite script, such as the pictographic inscriptions on the 16th-century BCE Gezer Jars, demonstrates the early evolution of linear alphabetic systems. By the 14th century BCE, this proto-alphabet coexisted alongside the Ugaritic cuneiform alphabet, a system that retained traditional Mesopotamian clay media and impression techniques, while implementing a novel alphabetic structure. By approximately 1300 BCE, Phoenician scribes at Byblos further refined these systems into a streamlined linear script based on the acrophonic principle, establishing a foundational model for subsequent Mediterranean alphabets.

The mainstream views are challenged by the "Old European" academic paradigm. The term Old European script (or Danube script) represents a distinct concept in European archaeology and epigraphy. It is regionally delimited in Central and Southeastern Europe (the Middle Danube region, Serbia, Romania, Bulgaria), primarily associated with the Neolithic Vinča culture, as well as the Karanovo and Tărtăria archaeological sites, in a time period c. 5300 BCE – 3500 BCE (Neolithic & Chalcolithic). There, a vast corpus of abstract symbols, geometric patterns, and pictograms incised on clay vessels, spindle whorls, figurines, and small clay tablets (such as the famous Tărtăria tablets) have been found [2].

Most modern archaeologists and epigraphers view the Vinča symbols as proto-writing or an ideographic notation system rather than true writing (glottography). The symbols likely served functional or ritualistic purposes (such as potters' ownership marks, religious iconography, or community identification) rather than encoding natural speech [3]. There is also a strong criticism against the very idea. According to A. Palavestra [4], to account for the morphological similarities between the Tărtăria tablets and Near Eastern administrative artifacts, Makkay attempted to adjust the regional chronological framework, thereby positing a direct historical linkage between the Balkan Neolithic and literate Near Eastern civilizations. However, empirical evaluation of the available evidence does not support the existence of a formal "Vinča script", nor does it demonstrate the characteristics of a true proto-writing system. Furthermore, comprehensive analyses of the artifacts displayed at the Novi Sad exhibition and cataloged in the accompanying literature suggest that graphic sign usage across the assemblage remains highly sporadic rather than systematic.

Nevertheless, the counter-arguments are not less significant. Archaeologist Marija Gimbutas co-opted the term "Old European Script" in the late 20th century, arguing that these symbols represented a pre-Indo-European writing system or a sacred, ritualistic proto-writing [5]. Linguist Harald Haarmann expanded on this, coining the term "Danube Script" and arguing it was a functional, linguistic or early-alphabetic notation system that predated Sumerian cuneiform [6]. Accordingly, this study will enquire the

framework of pre-writing and proto-writing in Eurasia, including the methodology with the criteria to decide whether a set of unknown symbols is writing or not.

Methodology

Linguists, epigraphers, and computational scientists use a specific set of linguistic, statistical, and structural criteria to determine whether an unknown set of symbols constitutes glottographic writing (a full writing system encoding a specific spoken language) or semasiographic/proto-writing (symbols, tallies, emblems, or decorative art that convey concepts directly without binding to speech grammar).

A foundational check is counting the number of distinct, repeating individual symbols (graphemes) in the corpus, where

a. an alphabet/abjad comprises 20–40 signs (e.g., Latin, Greek, Arabic);
b. a syllabic/abugida comprises 40–150 signs (e.g., Linear B, Devanagari, Cherokee);
c. a logographic/logo-syllabic script comprises 300–5,000+ signs (e.g., Cuneiform, Egyptian hieroglyphs, Chinese);
d. while non-writing/emblems systems comprise less than 15 or more than 10,000 symbols without reuse (e.g., Heraldic coats of arms, potter's marks).

Consequently, if an unknown script has 80 distinct signs, it is almost certainly syllabic; if it has 400, it is likely logo-syllabic. If it has millions of unique visual designs without standardized repeating units, it is visual art or heraldry rather than a script.

Linguists use statistical tests to check if the symbol distribution mirrors the mathematical structure of natural language (statistical structure and Information Theory). Natural human speech strikes a balance between total randomness and strict predictability, according to Shannon Entropy and Conditional Entropy. Entropy (H) measures the information density of single signs, while Conditional Entropy measures how much the n-th sign depends on the preceding signs, (n-1)-grams. In human language, word ordering and grammar place heavy constraints on which symbol can follow another (e.g., in English, a Q is almost always followed by a U). Non-linguistic symbol sets (like random decorative patterns or astronomical charts) fall outside this entropy range. According to Zipf's Law, in any natural language text, the frequency of a word/symbol is inversely proportional to its rank. A tiny handful of signs (function words, prefixes) occur extremely frequently, while the vast majority sit in a long tail of rare signs. True writing systems strictly obey this power-law distribution.

There are also combinatorial rules and syntactic organization criteria.

True writing reflects the linear, temporal nature of speech, as follows

1. In Linear Directionality, symbols are arranged along a primary line (left-to-right, right-to-left, top-to-bottom, or boustrophedon).
2. In Positional Preferences, specific signs consistently appear only at the beginning or end of symbol strings, reflecting grammatical affixes (prefixes, suffixes, gender markers, or case endings).
3. Regarding Repetition Restrictions, true scripts rarely repeat the exact same grapheme 4 or 5 times consecutively (e.g., AAAAA), whereas non-linguistic tallies or decorative borders often do.

Furthermore, according to the Open-Ended Expressive Capacity criterion, proto-writing systems (such as modern road signs, accounting tallies, or musical notation) can only convey messages within a closed domain. Specifically, Proto-Writing, expresses fixed ideas (e.g., "5 sacks of grain traded"), but cannot express abstract thoughts, complex conditional statements, or verbatim dialogue. In contrast, true writing possesses full expressive universality: it can record poetry, legal contracts, mythology, or everyday gossip seamlessly because it maps directly to a spoken human dialect.

A relevant case study is the Indus Script debate, where the famous Indus Valley Script (2600–1900 BCE) illustrates how these criteria are applied. According to the "Non-Writing" argument [7], it is pointed out that average inscription lengths are extremely short (only 4–5 signs long), lack long-text instances, and exhibit high sign repetition patterns more typical of clan symbols or religious emblems than running prose. In contrast, the "Writing" argument advocates [8] used Markov models and conditional entropy calculations to show that the sign order in Indus texts matches the statistical entropy profile of written languages (like Tamil, Sanskrit, or Sumerian) far better than non-linguistic systems (like DNA sequences or computer code). Although the debate remains open, primarily because no bilingual artifact (like a Rosetta Stone) has yet been discovered, it has been demonstrated that the Indus Valley script participated in the palaeographic scribal traditions and practices of the linear syllabic scripts of Bronze Age Eurasia [9].

Context

Typically, there are no confirmed true writing systems in Europe, or anywhere in the world, dating back 10,000 to 12,000 years ago (roughly 10,000 to 8,000 BCE). True writing, defined as a system capable of encoding full spoken language and complex syntax, did not emerge until much later with the Sumerian cuneiform and Egyptian hieroglyphs around 3400–3200 BCE. However, how the syntactic complexity of human languages can be known 12,000 years ago? What if there wasn't any syntax as perceived nowadays (subject, verb or object in some predefined order)? What if there were just few words arranged in short phrases without particular ordering rules? What "true writing" would be then?

Europe from this timeframe (the Late Upper Paleolithic to the Mesolithic transition) yields an abundance of geometric signs, symbols, and graphic marks. Archaeologists categorize these as forms of proto-writing or graphic communication, i.e., systems of external information storage that laid the cognitive groundwork for true writing.

Paleoanthropologist Genevieve von Petzinger documented that across Europe during the Upper Paleolithic (spanning 40,000 up to about 10,000 years ago), early humans repeatedly used a set of 32 specific geometric signs (Ice Age Geometric Cave Signs) in cave art and portable artifacts that reflect the origins of human graphic communication [10]. Her pioneering inventory documented and analyzed geometric signs across more than 350 Upper Paleolithic rock art sites.

These 32 geometric sign types identified across Upper Paleolithic sites include

- Linear and basic geometries, i.e., lines, dots, open angles, circles, triangles, rectangles, squares, zigzags, crosses;
- complex structural signs, i.e., claviforms (club-shaped), tectiforms (roof-shaped), cordiforms (heart-shaped), unciforms (hook-shaped), pectiforms (comb-shaped), flabelliforms (fan-shaped);
- enclosures and grids, i.e., hatchings, scaliforms (ladder shapes), peniforms (feather shapes), quadrangulates, lattices;
- somatic and natural forms, i.e., hand stencils, negative hands, serpentines, spiral forms, finger flutings, ovates, y-signs, segmented lines, serpentines, crescent shapes, tridacts.

In several rare instances, such as the "La Pasiega Inscription" in northern Spain (dating to approx. 14,000 BCE), multiple distinct geometric symbols were painted in a deliberate left-to-right linear sequence. This demonstrates intentional, multi-symbol message composition, if not presumably language-based writing.

The Azilian painted pebbles (galets peints) represent one of the most distinctive symbolic traditions of the Azilian culture in Western Europe (primarily southern France and northern Spain) [11] in the Epipaleolithic and early Mesolithic periods (c. 10,000–8,000 BCE) [12]. First discovered in large quantities (thousands) by Édouard Piette in the late 19th century at the type-site of Grotte du Mas-d'Azil (Ariège, France) [13], these small flat river pebbles are painted with red iron oxide (ochre) [14] into abstract geometric motifs like dots, bars, crosses, and chevrons on smooth, oblong river stones made of schist or limestone.

The Azilian pebbles are typically classified in the following motif categories [15]

- Dots/discs (single dots, aligned pairs, or rows), interpreted as counting/tally units or calendar markers;
- transverse bars (parallel stripes across the width), interpreted as numeric values or family/clan identifiers;
- geometric enclosures (chevrons, crosses, lattices, framing borders), interpreted as abstract spatial maps or tribal insignia;
- anthropomorphic/abstract motifs (stylized tree/feather shapes, central eyes), interpreted as ancestral spirit houses or ritual gaming tokens.

Early 20th-century scholars speculatively likened them to early alphabetic scripts, but modern archaeologists consider them to be tally marks, ritual tokens, counters, or family/clan identifiers [16].

Finally, the study of notched bones and antlers from the Epipaleolithic and Mesolithic periods (c. 20,000–6,000 BCE) spans both functional usage (e.g., pressure flakers, harpoon barbs, cordage production) and symbolic or cognitive applications (e.g., tally sticks, calendar keeping, external memory systems). Throughout Europe, bone fragments, deer antlers, and mammoth ivory dating to 10,000–8,000 BCE bear intentionally carved, repeating notches and linear groupings. Researchers analyze these as early tally systems or calendrical devices (tracking lunar phases or hunting counts).

The primary interpretations of osseous notches are typically classified in the following four categories

- Artificial memory systems / tallying (groups of parallel or sub-parallel notches, often made with changing tool edges/angles over time) denoting quantitative record keeping (kill counts, trade units, or lunar phase tracking);
- hafting and functional features (deep, irregular transverse notches near the base or head of the bone) denoting binding grooves to secure stone microliths or cordage using sinew and resin;
- technological manufacturing traces (repeated grooving along long axes or perimeter rings) denoting grooving-and-splintering technique (rainurage) used to extract bone blanks;
- ritual and decorative patterns (geometric zig-zags, cross-hatching, or regularly spaced perimeter notches) denoting symbolic identity markers, ownership signatures, or aesthetic ornamentation.

While not written words, notched bones represent symbolic external memory storage, a direct conceptual precursor to numerical writing systems.

In this quest many scholars contributed in various aspects. Indicatively, the foundational monograph of G. Clark documents Britain's most famous Early Mesolithic site that contains detailed descriptions and illustrations of notched red deer antler frontlets and barbed bone points [17]. The pioneering work of A. Marshack applied microscopic analysis to incised and notched bone/antler objects from the Late Upper Paleolithic and Epipaleolithic, arguing that repetitive series of notches made by different tools over time represented external memory systems and lunar calendars [18]. F. d'Errico, critiques earlier tally/calendar theories by introducing microscopic technology-of-manufacture analyses and outlines diagnostic criteria to distinguish intentional artificial memory systems (sequential notch groupings) from decorative patterns, tool manufacturing marks, or butchery damage [19]. He also examines how notched organic materials served as symbolic storage media bridging Epipaleolithic hunter-gatherer cognition to Mesolithic and early farming counting systems [20] I. Radovanović explores the social, symbolic, and economic uses of worked osseous materials, including engraved and notched human and animal bones from the Mesolithic Iron Gates sites [21]. É. David focuses on technological chains of production (chaîne opératoire) for notched bone and antler items across French, Belgian, and North-European Early Mesolithic sites [22]. E. Benjamin re-evaluates Early Mesolithic bone and antler working across Lowland Britain, analyzing manufacturing traces, notch patterns, and tool use-wear on red deer and elk osseous artifacts [23]. Finally, herein, S. Vitezović details the rich bone and antler assemblages from the Danube Gorges (e.g., Lepenski Vir, Padina), documenting notched roe deer and red deer antler tools, harpoons, and decorative/symbolic artifacts spanning the Epipaleolithic to Mesolithic transition [24].

Summary

To summarize the distinction between the proto-writing of (e.g.) the Azilian pebbles (10,000–8,000 BCE) vs. the true writing systems of Sumer or Egypt (c. 3,500 BCE), three features are considered. The first one is the primary units used, where the former have abstract symbols, geometric

lines, dots and tallies, while the latter have logograms or phonograms (representing sounds and grammar). The second one is the function served, where in the former we have identifiers, memory aids and astronomical tracking, while in the latter we have full transcription of spoken dialogue and legal/economic prose. The third one is the syntax encountered, where the former exhibit non-linguistic structures (no noun/verb), while the latter exhibit strict linguistic grammar and syntax.

Therefore, while these Ice Age markings are not considered to be "writing" in the modern sense, they show that 10,000 to 12,000 years ago, Europeans were utilizing a standardized, continent-wide code of symbols to communicate and store information visually.

Commentary

Having set the methodology of determining what constitutes glottographic writing or not, and the European context of pre-Neolithic proto-writing, the European Neolithic and Chalcolithic (c. 5300 BCE – 3500 BCE) writing of "Old European Script" will be enquired, focusing on the southern Balkans where is nowadays Greece.

When archaeologist Marija Gimbutas introduced the concept of "Old Europe" (c. 6500–3500 BCE) and its associated sign system (the Old European script, Danube script, or Vinča signs), she defined Southeastern Europe, including Northern Greece and the Aegean, as an integral part of this cultural and symbolic sphere [25]. In Gimbutas' framework, Old Europe was not restricted to the Danube valley (present-day Serbia, Romania, and Bulgaria); it encompassed the Aegean basin and northern Greek regions as well. Key Greek Neolithic sites formed part of her core evidence base, such as Dispilio at Lake Kastoria, Sitagroi at Drama region and Promachonas-Topolnica (Macedonia in Northern Greece) that lie directly within the geographical distribution of Neolithic Balkan sign-bearing artifacts, as well as excavations at sites like Achilleion (directed by Gimbutas) and Sesklo/Dimini (Thessaly in Central Greece) that yielded pottery, loom weights, and anthropomorphic figurines featuring linear incisions matching the Old European sign repertoire [26]. Five such Neolithic sites will be presented next, plus one of Early Bronze Age (Milos).

1. The Dispilio Wooden Tablet (Kastoria, Greece) was unearthed in 1993 by archaeologist George Hourmouziadis at the lakeshore settlement of Dispilio, near Kastoria [27]. The object is a waterlogged wooden tablet bearing incised linear marks organized in rows, found floating in waterlogged Neolithic sediments. Radiocarbon dating yielded a calibrated date of approximately 5250–5000 BCE. Similar linear marks have also been identified on ceramic vessels excavated at the same site [28]. Frequently cited by advocates of the Danube Script (e.g., Harald Haarmann) as one of the oldest inscribed wooden artifacts in Europe. For the mainstream view, it is considered a legitimate pre-writing or ideographic notation system akin to the Vinča culture symbols of the central Balkans that suggests these marks served functional, economic, or ownership purposes. In contrast, popular media and fringe accounts often claim the tablet proves that the Greek alphabet or Linear A/B existed 7,000 years ago. Academic consensus rejects this, pointing out that linear geometrical symbols occur naturally across many prehistoric cultures without direct linguistic continuity to later alphabetic writing. The Dispilio tablet remains a subject of debate due to its depositional context and ongoing conservation requirements, though its early 6th-millennium BCE radiocarbon dating is widely accepted.
2. Achilleion Figurines (Thessaly, Greece) are female figurines inscribed with graphic markings, dated c. 6000–5500 BCE and interpreted by Gimbutas as sacred ideograms rather than purely decorative motifs [29].
3. Sitagroi Inscribed Ceramics (Drama, Greece) have been excavated by Gimbutas and Colin Renfrew; these yielded sherds and ceramic figurines bearing abstract sign combinations (V-shapes, chevrons, parallel lines) are dated c. 5000–4000 BCE [29].
4. The Giannitsa Seal (and Seals of Northern Greece) feature deeply incised geometric motifs, including meanders, spirals, zigzags, concentric shapes, and linear markings. Giannitsa (located in Central Macedonia near Archontiko) sits within a rich Neolithic and Early Bronze Age archaeological landscape [30]. Clay and stone stamp-seals (pintaderas) have been also discovered across other sites in Central/Western Macedonia (such as Paliambela, and Dikili Tash), dated primarily to the Late Neolithic to Early Bronze Age (c. 5000–2500 BCE). Some researchers (e.g., Harald Haarmann and local epigraphers) link Northern Greek seals to the wider Vinča / Old European / Danube script sphere, suggesting that these stamp-seals were part of a trans-Balkan symbolic communication network [31]. Most archaeologists view these objects as stamps for body decoration (tattoos), potters' identity marks, or tribal/ownership markers for textiles and perishable goods. They are seen as precursors to administrative iconography rather than phonetic writing.
5. The Inscribed Potsherd of Gioura (Northern Sporades, Greece) was excavated in the early 1990s by Adamantios Sampson at the Cave of the Cyclops on the uninhabited islet of Gioura (Yioura), dated c. 5000–4500 BCE [32]. Among the findings (which include fishing gear and Middle/Late Neolithic painted pottery) was this single ceramic sherd with incised linear markings (including shapes resembling symbols or characters) made prior to firing. Authenticated as a genuine Neolithic ceramic artifact, the markings are understood as potters' marks, property indicators, or symbolic motifs rather than a full glottographic script. Like Dispilio, it demonstrates that communities in the Aegean basin were utilizing standardized symbolic systems on clay and wood thousands of years before the Aegean Bronze Age scripts (Linear A/B) emerged.
6. Milos (Cyclades) played a pivotal role in Aegean exchange due to its rich obsidian sources and strategic location between Crete and mainland Greece. Excavations at sites like Phylakopi and Rivari yielded significant evidence of early incised ceramic marks and seals spanning the Early Cycladic III to Middle Cycladic periods (c. 2500–1800 BCE). Specifically, Later Bronze Age layers at Phylakopi produced clay sealings and pottery inscribed with formal Linear A signs alongside local potters' marks [33]. Rivari Incised Bowls is a group of undecorated shallow bowls discovered at Rivari bearing pre-firing incised linear symbols resembling signs like Lambda, M, Pi, N, T, X, and O. Epigraphic studies show significant structural

overlap with early Linear A and Cretan Hieroglyphic signs [34]. The Milos findings demonstrate early Minoanization and trade interaction. The incised symbols served as an administrative tool, used for accounting, marking batch origins, or certifying container contents, thus proving that the Cyclades adopted elements of Cretan administrative technology well before the Late Bronze Age [35].

The seals and inscribed ceramic artifacts from Giannitsa (4) and Milos (6) are central to discussions on early Aegean symbolic notation, trade networks, and administrative marking systems. While they belong to different cultural periods (the Neolithic and Early/Middle Bronze Age), both locations offer critical evidence for how non-alphabetic graphic marks evolved in Greece prior to or alongside formal Aegean writing systems.

Linguist Harald Haarmann expanded Gimbutas' work, proposing The Continuum Hypothesis that the Danube script extended south into Northern Greece and served as a cultural precursor to later Aegean Bronze Age sign systems, such as Linear A and Cretan Hieroglyphs [36]. Gimbutas argued that these marks were not administrative/economic tools (unlike early Sumerian cuneiform), but rather a sacred, non-phonetic communication system, integrated into domestic and communal religious practices across Southeastern Europe and Northern Greece.

While proponents of the "Old European Script" include Greek Neolithic findings in their corpus, mainstream prehistoric archaeology and historical linguistics maintain a more cautious stance. Most mainstream scholars classify the marks (including the Dispilio tablet and Vinča symbols) as proto-writing, property marks, or ritual iconography, rather than a fully developed script encoding spoken language.

Comparisons

Comparison tables mapping Old European signs to later linear writing systems (such as Cretan Linear A, Linear B, Cypro-Minoan, and early Mediterranean alphabets) have been published primarily by researchers investigating early symbolic transmission and pre-writing systems. Linguist Harald Haarmann has published extensive typological comparison tables contrasting the Danube Script with ancient linear scripts, including Proto-Elamite, and Ancient Indus scripts [6]. Haarmann organizes sign inventories into structural categories (basic geometric shapes, V-shapes, X-shapes, parallel strokes, comb-like motifs, and ligatures). He presents side-by-side visual alignments to argue for structural parallels and graphic continuity across the Mediterranean basin.

Shan Winn *et al.* [3] compiled one of the first comprehensive taxonomic catalogues of Vinča signs. While focusing primarily on the Vinča corpus, their sign inventory compares core Vinča geometric sign variants with Aegean linear scripts (Linear A and B) and Near Eastern notation systems. They also categorize signs into core sign types, modified signs, and isolated potters' marks, providing systematic sign charts that later researchers used for cross-script comparisons.

Archaeosemiologist Marco Merlini created the DatDas (Data Bank for Danube Script) database, compiling over 5,400 sign variants from Old European artifacts [2]. Merlini provides comparative visual matrices, mapping Old European signs to Aegean scripts (Linear A/B) and Anatolian scripts. His tables categorize signs by sign-clusters, positional frequency on ceramic objects, and graphic morphology (e.g., cross-hatching, chevron combinations, and loop motifs).

Independent paleographers (e.g., Wolf Scheuermann [37] have compiled digital sign charts aligning basic Old European sign variants directly with Unicode sign sets for Linear A, Linear B, and Cypriot Syllabaries. These tables map basic phonetic/syllabic shapes (e.g., V, X, Lambda, Pi, H, T) across scripts to test whether sound values assigned to Linear A/B signs could hypothetically read Old European ceramic inscriptions.

While comparison tables demonstrate striking visual resemblances between individual signs, mainstream epigraphers and archaeologists urge caution regarding claims of direct historical descent. Simple linear shapes (such as lines, crosses, triangles, chevrons, and grids) naturally recur across unconnected human cultures due to the physical mechanics of incising soft clay with sharp instruments (geometric coincidence**)**. A chronological gap of roughly 1,000 years separates the decline of the Vinča culture (c. 3500 BCE) from the emergence of Cretan Linear A (c. 2500 BCE), making direct graphic transmission difficult to prove without intermediate epigraphic links. Finally, there is a functional difference, since Old European signs occur mostly as single symbols or small clusters on religious and ceramic items, whereas Linear A and B are systematic, fully formed administrative glottographies (writing and encoding natural language).

Conclusion

The issue of "Old European Scripts" (OES) is full of biases, premature assumptions and even certainties, based on incomplete or misinterpreted data, both by proponents and adversaries. To begin with the latter, a bias is that some of them cannot imagine the existence of true writing prior to the Sumerian/Egyptian logography (c. 3500 BCE), as advocates of the "ex oriente lux" in the history of writing [38]. Nevertheless, the OES ("European" in a strictly geographical sense herein) appear to have many of the criteria for being true writing ones. More specifically and taking merely as an example the Dispilio tablet (1), its symbols exhibit linear directionality (i), positional preference (ii) is difficult but not impossible to be verified through the only picture of the original artifact, while there is no excessive repetition (iii) observed either. The primary units used, the function served and the syntax encountered (see Summary) are unknown, but this is true for any undeciphered signary. One of the longest inscriptions of Linear A is a spiral one on a cup [39], and in Cretan Hieroglyphics the Malia Stone Inscription [40]. Limited positional preference (ii) is observed to both, and the syntax of the former is unknown (being undeciphered), while the interpretation of the latter reveals an invocation, which is not a typical form of syntax. In fact, none of the Cretan scripts (Linear A/B, Cretan Hieroglyphics) exhibit the complex grammar/syntax of true writing, being labels, invocations or record keeping documents, yet their nature as true writing scripts is not disputed. The vast majority of OES inscriptions may be short labels, but in this sense, they don't differ from any other equivalent inscription of the Bronze Age scripts [9]. Even on the Gradeshnitsa tablet [41], the first upper and the two bottom lines of the front side can

be easily Labels that describe the content of this artifact. Finally, regarding the potential time gap between the decline of the Danube culture and the emergence of Cretan Linear A, the excavations on Milos (6) indicate that parts of OES might have survived to that date.

Regarding the proponents of OES, these of them who predetermine the nature of the script (a-c) don't have enough evidence for this purpose other than the number of symbols, if near definite. Depending on the scholar, the full repertory extends past 300 to 500 distinct variants [2], while the core typology may comprise 210 unique type-signs [3]. This number refers to a logographic/logo-syllabic script (c). However, over 85% of recorded artifacts feature only a single isolated symbol, while roughly 15%–20% of all discovered signs consist of "comb" or "brush" tally marks, which many researchers suspect, were used as early numerical or inventory systems for trade. Furthermore, Shannon entropy (H) and conditional entropy has been calculated for the OES [8], but its measurement is a subject of significant debate among computational linguists and archaeologists. The entropy profile for OES reflected high randomness or weak sequential constraints, putting it in a distinctly different mathematical class than full spoken languages (such as English, Sumerian, or Tamil).

The application of Shannon entropy to the OES faces major mathematical constraints, therefore, although measured, the statistical results consistently show that the script lacks the sequential predictability of natural human language. Instead, its entropy profile aligns with ideographic, religious, or administrative proto-writing, where symbols convey stand-alone meanings rather than encoding spoken speech. In addition, Zipf's Law has been also tested and measured on the OES, as part of broader statistical analyses comparing ancient undeciphered scripts against known languages and non-linguistic symbol systems, where the symbol distribution does follow a heavy-tailed, power-law curve characteristic of Zipf's Law. Nevertheless, while the symbol frequencies match a Zipfian distribution, computational linguists emphasize that Zipf's Law does not prove the symbols represent a spoken language. In short, while the OES obeys Zipf's Law, this is a property shared by both human languages and structured non-linguistic sign systems.

Finally, some observations on the history of writing are considered necessary here. Supposedly, the evolutionary course of writing goes from the non-writing/emblems systems (d), to logographic/logo-syllabic scripts (c), to syllabic/abugida (b) and ends up to alphabetic/abjad ones (a). Particularly, in the transition from (c) to (b), the logograms/pictograms take a more abstract form that still resembles in a simpler manner the depicted object or notion. The findings on Milos (6) indicate that the Cretan Protolinear Script (CPS) hypothesis may not be just a hypothesis [42]; namely, that the creation of Linear A (as a manifestation of the CPS) preceded the creation of Cretan Hieroglyphics or it was parallel, the latter being the ornamental and ritual version of the former. This unified evolutionary step (b+c) may had happened elsewhere. When the Sumerian/Egyptian logography was devised, the Europeans (at least) were already using abstract symbolic systems/signaries for more than ten millennia ("La Pasiega Inscription"). It will be demonstrated by the author herein, in a study to be published soon, that this regression on the history of writing was an intentional anachronism of the socio-political elites in Sumer/Egypt.

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