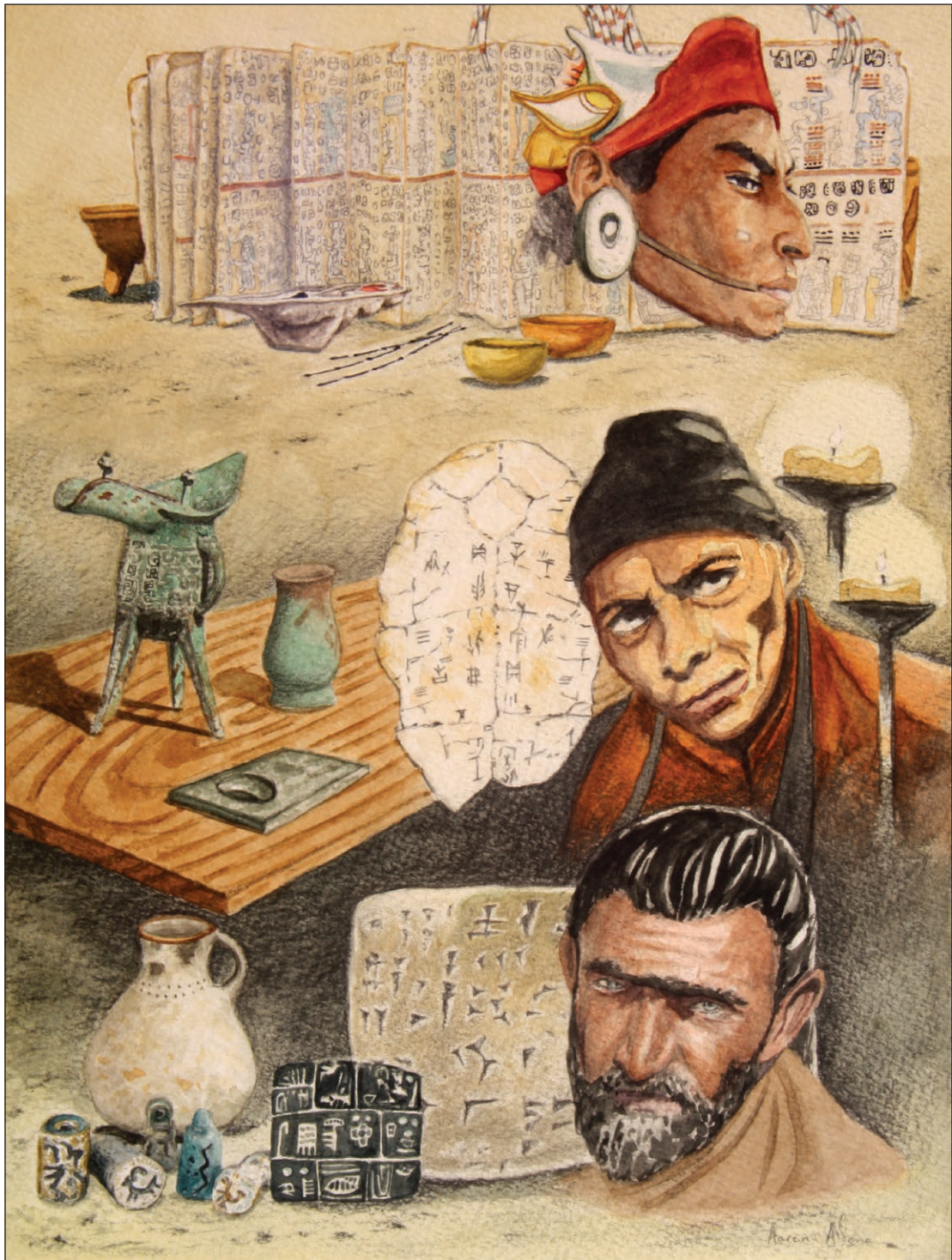


# Reading (Between) the Lines: Cultural Insight through Palaeographic Analysis

Emily Davis-Hale  
Tulane University  
edavis9@tulane.edu

*Despite the central role of cross-cultural comparison in Knorozov's 1952 breakthrough decipherment, the approach fell out of favor in the ensuing decades of Mayan epigraphy. A burgeoning interest in palaeography stemming from Lacadena's work in the 1990's presents an excellent opportunity to reunite with other world areas. The inherent interdisciplinarity of palaeography is well attuned to Maya studies on the whole, as no subfield in this area is autonomous. This paper surveys palaeographic work on the ancient scripts of Sumer and China to illustrate how palaeographic analysis contributes to myriad fields from epigraphy and linguistics to archaeology and cultural anthropology. In both of these cases, palaeography has provided evidence for increasing social complexity and stratification, including the emergence of specialized scribal classes. Writing especially affected those societies' approaches to economic and legal administration. A thorough palaeographic analysis of Maya hieroglyphic script now rests on the success of decipherment and the construction of a text corpus. With new information from palaeographic sources, the canon of knowledge regarding ancient Maya culture could expand exponentially, especially as archaeological investigation continues to produce new texts to supplement the existing corpus.*

*Keywords: epigraphy, script development, palaeography, social stratification, cross-cultural comparison*



Writing has been invented by at least three independent civilizations – ancient China, Sumer, and the Maya – in the past 5,000 years. Innumerable scripts representing innumerable languages have flourished throughout the millennia in both the Old World and the New; writing has been subject to virtually every whim of human creativity, from wooden styli in clay to endlessly manipulatable digital texts. Centuries of scholars have built careers on studying the various aspects of writing, including the topic at hand: the physical process of creating a text. As I will argue later, the materials, knowledge, and stylistic latitude of writers around the world may reveal even more about their originating cultures than their writing itself can.



This article begins with a brief discussion of theories of the development of writing, how these theories pertain to Maya writing, and how they relate to the fields of archaeology and linguistics. The discussion is followed by a closer examination of the methods and insights associated with palaeographic analysis of Sumerian and Chinese writing to accord with the cross-cultural theme of this issue. Finally, I connect the current state of Maya palaeographic analysis to corresponding stages in the analysis of Sumerian and Chinese, extrapolating from those comparisons to outline possible future directions of investigation.

## Development

For decades, contention has surrounded the question of why humans developed writing systems – a seemingly simple concept which however warrants a clear definition. In contrast to iconography or pictography, which are explicitly bound to visual representation of subjects, writing must be linked to a particular language and cannot be fully understood outside the context of said language. This definition concurs with that of other epigraphic scholars (Justeson 1989; Justeson et al. 1985; Robinson 2007, 2009), although it is narrower in scope than the definition preferred by some Mesoamericanists (Boone and Mignolo 1994; Boone 2000). Additionally, writing systems display a level of developed abstraction that distances them from purely pictographic representation (with notable exceptions like full-figured Maya hieroglyphs; Robinson 2007). It should be noted that prominent twentieth century scholars including Gelb (1952:v) privilege the concept of symbolic “human intercommunication” without requisite linguistic value. Those hypotheses divert focus from the need for writing to be understood “without the intervention of the utterer” (Daniels 2018:132).

### *Where does writing begin?*

Even when “writing” is limited in the ways described above, its foundations are disputed. Some scholars, such as Nissen and colleagues (1993), argue for an economic origin of Mesopotamian writing in which increasingly complex bookkeeping practices spurred the development of language-linked symbols from earlier pictography. “[T]he great majority of the 5,000 or so written documents from [the Late Uruk period] deal exclusively with administrative procedures,” they write, and “it is certainly no coincidence that not one of them is clearly related to religious, narrative,

or historical topics” (Nissen et al. 1993:21).

Another hypothesis that Nissen and colleagues (1993) acknowledge is based upon early “name tags,” short texts that contain no discernible numerical information nor any recognizable iconic representation. In theory, symbols representing sound emerge in this context in order to accurately write foreign names — that is, names with no inherent meaning in the language of the writer. This theory does not preclude earlier stages involving pictography, and in fact, one proposed developmental path begins with iconographic writing that is later used in a rebus capacity wherein the written sign refers only to a specific sound in the name of the original referent; an acrophonic hypothesis is similar, but requires the sign to represent the *first* sound of the referent (Cooper 2004; Mora-Marín 2003; Robertson 2004; Robinson 2007). Robertson (2004:26) provides a succinct description of the process that moves writing from pictography to phoneticism as scripts evolve: “the association [of a referent with a symbol] [becomes] habitual, no longer based on [visual] similarity.”

### *Reading culture in writing*

The heart of my argument rests not so much in strict identification of what motivates writing as it does in considering the cultural implications of the origins and evolution of writing systems. Several authors (Algaze 2005; Law 2015; Nissen et al. 1993) consider the potential roles of writing in cultural change, particularly in contexts where the emergence of writing occurs concurrently with increasing social complexity. Crucially, the importance of writing is not lessened when this technology is borrowed rather than independently innovated. This strikes me as a particularly salient point when the Maya system is under discussion precisely because of our uncertainty concerning origins of Mesoamerican writing.

What does writing make possible when it is first introduced? The previous section mentioned several proposed motivations for the development of writing, including economic and administrative recordkeeping and individual name identification. Progression of writing systems beyond pictography, as Robertson (2004) suggests, allows for the recording of concepts without explicit visual form because written symbols no longer refer directly to an object, but to an abstract element of language (a syllable, morpheme, word, etc.). Once writing has reached this stage, no longer restricted to visually identifiable forms, it becomes possible to put virtually anything to text.

Even the earliest writing takes full advantage of this inherent flexibility. In Sumer, tablets preserve records of merchandise and palace inventories. In China, diviners wrote their prophecies on the very materials they used to read the future (Figure 1). In Mesoamerica, histories of gods and kings are inscribed in stone. Writing provides a unique opportunity to save grand narratives or banal minutiae for posterity, but the *who* and *how* of writing are just as important as the contents of a text.

Social organization and hierarchy are among the foundational investigations of anthropology (Trigger 2006). Where writing exists, it acts as a crucial avenue of insight into these topics. Access to literacy is, historically, controlled by the socially dominant; studying the classes of people who were literate reveals a great deal about social stratification, distributions of power, and the socio-political role of writing itself in any given group (Robinson 2007). It is also informative to study developmental trajectories in order to tease out the patterns of when, where, and how elements of



**Figure 1.** Inscribed ox scapula, ca. 1200 B.C. (photograph © Andrew West, licensed under CC BY-SA 2.0).

stylization and standardization occur (Robertson 2004; Bricker 2007; Robinson 2007). In these areas, correspondence with other areas of anthropological study becomes both more evident and more complex.

### **Palaeography across Disciplines**

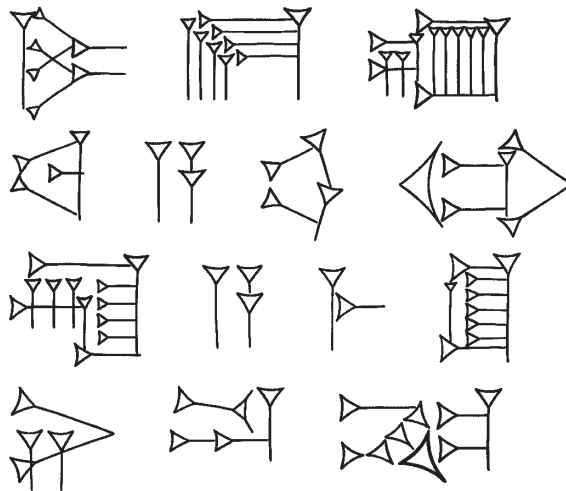
At this point, *palaeography* as a discipline must be differentiated from its scholarly relatives. Palaeography does not deal with the content of texts. In this sense it aligns more with archaeology and art history than with linguistics. However, palaeographic study holds significant implications

for all of these fields. Palaeography communicates closely with key aspects of archaeological and art historical study in that it is concerned with physical artifacts and technologies in addition to the abovementioned social dimensions (Houston 1989). Because of the inextricable link between writing and language, palaeography is necessarily connected to linguistic processes as well (Justeson 1989; Lounsbury 1989; Robinson 2007).

From an archaeological perspective, writing is a technology and a tool of social complexity (Houston 1989; Trigger 2006; Gu 2009; Law 2015). Texts hold a unique position within the artifactual canon. Unlike many of the materials that archaeologists interpret to learn about the past, writing has the ability to preserve the actual statements of ancient people, leaving a rare firsthand account of history. Beyond the words themselves, though, texts — especially in palaeographic view — provide clues to courses of social interaction and change.

The key factor in this branch of analysis is physical form. Not only does palaeography concern long-term development of writing as discussed in previous sections of this paper, but it also gives insight on synchronic variation within a society. Like other components of stratified society such as prestige language, architecture, and fashion, writing style exhibits a pattern of centrifugal diffusion (Algaze 2005; Houston and Martin 2016; Justeson et al. 1985; Lacadena 1995; Law 2015). Among the Maya, for instance, scholars favor the model of scribal workshops wherein specialists were trained in a particular style, often associated with a patron site; from those foci of creation emerged identifiable elements that moved farther afield according to sociopolitical influences (Houston et al. 2014). A similar workshop system in Sumer is evidenced by the composition of a scribe describing a trainee’s daily routine at the “tablet-house” (Figure 2; Kramer 1949; Robinson 2007). In these cases, because of the necessary structure of a centralized education, writing style must be a “top down” feature of material culture.

Where a writing system has been sufficiently deciphered, linguistic and palaeographic analysis



**Figure 2.** Excerpt from “tablet-house” cuneiform composition (drawing by author).

can inform one another as well. Recent investigations into the language of Maya hieroglyphs exemplifies this synthesis, where linguistic reconstruction, stylistic analysis, and distribution patterns of both language and visual style all contribute to hypotheses of the system's origins (Houston et al. 2000; Houston and Martin 2016; Law and Stuart 2017; Lounsbury 1989). Reliably dated writing also provides a check for historical reconstruction and a timeline, both relative and absolute, for the development of the language in question (Campbell 1988; Kaufman 1962, 2017; Lacadena 2005).

Although there is no comprehensive scholarly guide to palaeographic analysis, I observe three assumptions that underlie existing studies:

1. *The palaeographic record is incomplete.* Preservation of texts depends on myriad factors, both historical and modern, the vast majority of which are outside the control of modern scholars.
2. *Missing data could potentially be older than existing data, created on perishable material, or both.* The first part of this assumption is a practical consideration. Because of the tendency in many areas to build continuously on the same sites, the most ancient artifacts can be difficult if not impossible to recover. The second part of the assumption is related to the aforementioned preservation issue and is especially relevant for areas such as Mesoamerica where perishable materials are prone to complete disintegration.
3. *Even where it has been recovered, the very first evidence of writing may not be identified as such.* Regardless of the motivation for their invention, very few nascent writing systems emerge fully formed. Slow and irregular development of a system that is recognizable as writing makes the identification of the very beginning of that system virtually impossible. By the time modern scholars can confidently label a system as “writing,” it may have already undergone extensive change that cannot be reliably connected to later stages. Once again, this assumption connects to the others, taking account of the likelihood that older data are likely to be left out of the palaeographic record.

With these assumptions in mind, analysis begins with the straightforward collection of a corpus of individual signs, each associated with a linguistic value and date thanks to work in related disciplines. Organizing signs into a valid comparative framework forms a great bulk of palaeographic analysis. The criteria for organization may include linguistic value, creation date, location, medium, and diagnostic sign elements. Depending on the number of criteria being addressed and the number of texts involved, a palaeographic database can become staggeringly complex.

In contrast to the potential complexity of a palaeographic corpus, analysis itself can be relatively simple. A set of signs that have been aligned according to certain shared criteria present, through their other attributes, a broad view of stylistic development. As an example, consider Lacadena's (1995:133) “Evolución gráfica del signo T173.” Lacadena first gathers a variety of examples of the sign under consideration, T173, with associated dates and sites. He then demonstrates the diagnostic visual characteristics of T173 (a trilobe with two elements between lobes, surrounding a central component) and tracks stylistic variation of T173 signs, defining multiple “graphic types” for each diagnostic element. Finally, Lacadena proposes a timeline and geographic diffusion model for the sign's visual development (Figure 3).



**Figure 3.** T173 graphic variants (drawing by author, after Lacadena 1995).

### Palaeography across Cultures

With the relevance and methods of palaeography now established, I now turn to palaeographic contexts with a broader foundation of decipherment and larger corpus of texts than the Maya world presently enjoys. I begin with an overview of Sumerian and Chinese writing, connecting their palaeographic study to cultural insights. Finally, I draw comparisons between the methods used in studying those writing systems and the ongoing work on Maya hieroglyphs with the aim of defining trajectories for future study in this field.

#### *Sumer*

Sumerian cuneiform, the world’s oldest known script, is ideal to begin a cross-cultural investigation of palaeographic analysis. The first evidence of the cuneiform system dates to ca. 3100 B.C., preserved in the clay used as writing medium (Nissen et al. 1993). In its early stages, cuneiform retains visual elements that connect its symbols to their original referents, but throughout development the signs display increasing abstraction as proposed by Robertson (2004) and illustrated in Table 1. Nissen and colleagues (1993:19), however, note that “within each of the identified script

	3100 BC	3000 BC	2400 BC	1000 BC
head				
water				
go/stand/bring				
mountains				

**Table 1.** Cuneiform signs at various stages of development.





**Figure 4.** Sumerian cylinder seal (photograph © Steve Harris, licensed under CC BY-SA 2.0).

phases [at Uruk] there were hardly any notable differences in the execution of the signs. In fact, the script of the earliest tablets revealed such a relatively great conformity that doubts were raised that they indeed represented the earliest form of literacy.”

If the earliest *evidence* of Sumerian writing is not in fact the earliest *writing*, there may be a significant amount of palaeographic development that remains invisible to modern scholars. Regardless, an incomplete record does not negate the importance of the information available from extant texts. That incompleteness itself suggests further insights into the cultural development of writing in Sumer, hypotheses which remain to be confirmed or rejected if additional evidence comes to light through ongoing archaeological work.

From the known record, a great deal can be hypothesized about the ancient Sumerian culture that gave rise to and sustained the cuneiform system. One of the most basic pieces of information available concerns the medium of writing. Cuneiform texts are produced by pressing a triangular stylus into clay tablets using a variety of strokes (Nissen et al. 1993:18–19). Experimental archaeology provides even more detail about the physical production of tablets through testing of clay formulations and techniques of stylus use (Algaze 2005). Archaeologically, it is possible to confirm relative quality of tablet materials; palaeographically, as mentioned above, the quality of writing and education are clear. A high level of conformity such as Nissen and colleagues (1993) note is typically an indicator of educational standards for the writing class, whether that class is populated by exclusively specialized scribes or by a broader segment of society. Given the thousands of tablets extant from Sumer, their stylistic conformity, and the formulaic nature of their contents, a system of scribal education is almost certain. That hypothesis is explicitly confirmed by the earlier illustrated “tablet-house” composition (Figure 2).

Aside from the existence of standardized training, what information does the palaeographic

record provide about the culture of ancient Sumer? The visual forms of some signs indicate the physical environment of the script's originators, particularly the broad categories of flora and fauna to which they were accustomed. Cylinder seals are an excellent example of that visual consistency. Where the seals display both writing and pictures, correspondence between pictorial elements becomes clearer (Figure 4).

Consideration of the creators of cuneiform returns this discussion to a previous point: a potential lacuna in the palaeographic record prior to the earliest extant evidence. The existence of such a gap is not ideal when analyzing long-term development of a script, but neither is it completely detrimental. Reconstructions (whether palaeographic, linguistic, or archaeological) are not predicated on the assumption that the record is complete, and therefore they are not entirely invalidated upon the mere appearance of additional evidence. Working from the foundational assumptions given previously and with knowledge of the extant palaeographic record, we can form several hypotheses about why extant cuneiform texts display such regularity. The first is that earlier texts may have shown significantly less standardization while the writing system underwent typical changes to better represent the language. The second is that extensive codification took place at some point prior to the beginning of the extant record, although this process may have occurred either before or in tandem with the creation of scribal schools.

### *China*

The earliest evidence of writing in China occurs during the Xia dynasty, circa 2200 – 1600 B.C. Because of this timeline, it is unclear whether Chinese writing represents an independent innovation of the technology or cultural diffusion from Mesopotamia (Bagley 2004). Gu (2009:103) describes these earliest inscriptions made on tortoise shells and animal bones as being used primarily in a divinatory capacity, hence the name “oracle bones.” Interestingly, the inscriptions are made directly onto the materials that were used for divination; some even venture into historical record by providing verification of prophesied events (Gu 2009:108).

Although graphic symbols appear on some Neolithic pottery in China well before the advent of Xia oracle bone inscriptions, no writing-like symbol prior to the Xia period is confirmed as having linguistic value (Bottéro 2004; Gu 2009). The characteristics of “a complete system of the Chinese script” must include six particular criteria (Gu 2009:108): (1) hieroglyphics; (2) self-explanatory characters; (3) associative compounds; (4) phonetic loan characters; (5) pictophonetics; and (6) mutually explanatory or synonymous characters. All six of these are present in the oracle bone inscriptions, but there is no earlier evidence of a Chinese script that complies.

Approximately 4,500 distinct characters have been identified across more than 100,000 fragments, providing a broad base for palaeographic analysis. This sizable corpus of ancient texts allows for confirmation that the sign catalog is both diverse enough to sufficiently represent language and standardized enough to effectively serve a literate class (Bagley 2004). Because this corpus constitutes the earliest evidence of Chinese writing, however, these characteristics raise the same concerns about the completeness of the record that were discussed for the context of Sumerian cuneiform. Bagley (2004:222–225) explicitly addresses those concerns and speculates on the kinds

of texts that may have been lost.

The large number of distinct characters in early Chinese script immediately sets it apart from cuneiform as a writing system and signals a legitimate precursor to modern Chinese, which boasts more than 100,000 characters by some estimates (Gu 2009). The nature of the system itself tends toward inventiveness, much like the Maya hieroglyphic script, because of the visual versatility of sign combination. Despite such versatility, tracing the stylistic development of Chinese from oracle bone inscriptions through administrative texts in bronze and on paper to modern digitized forms is shockingly simple. The highly pictographic signs evident in early divinatory texts undergo abstraction and standardization as the technology spreads into more cultural domains. By the later Shang period, around 1000 B.C., a clearly codified script and identifiable scribal signatures indicate a comparable system of specialization to that of the Sumerians (Bagley 2004; Giele 2005; Nissen et al. 1993).

Such specialization, as Trigger (2006) discusses, is often correlated with greater social stratification. The leaders of both Sumer and China kept detailed administrative records that were managed by trained scribes, but Law (2015:162) makes the argument that “writing needs complex society more than complex societies need writing.” In essence, the very existence of writing — especially codified script and trained scribes — is itself an indicator of a society with some level of stratification and specialization.

### **The Maya Case**

In certain respects, the Maya system itself is more closely comparable to Chinese than to Sumerian writing. The script displays an incredible flexibility of stylistic and linguistic expression that the cuneiform record lacks. On the other hand, visual similarity between Maya art and script recalls that of Sumer. Maya society does echo the structural organization relevant to writing in both Sumer and China. While we currently lack more than fragmentary archaeological evidence of ancient Maya scribal schools, the conformity in areal styles heavily implies centralized training, and Zender’s (2004) investigation of the priestly class may provide a comparable framework for reconstructing such a system (Houston 2000; Houston and Martin 2016; Lacadena et al. 2017).

Despite these immediate comparisons, the field of palaeography is a recent addition to the canon of Maya studies. Lacadena’s (1995) doctoral dissertation represents the first explicit foray into Maya palaeography a mere 25 years ago. Since then, the scholarly community has pursued multiple avenues of investigation on the topic. Corpus epigraphy, so named by Kettunen (2014:38), takes advantage of ongoing projects that since the late 1960’s have amassed significant databases of hieroglyphs: the Corpus of Maya Hieroglyphic Inscriptions at the Peabody Museum of Harvard University (Fash 2016); the Maya Hieroglyphic Database Project at the University of California–Davis (Macri 2017); Kettunen’s (2014) corpus; and the Textdatenbank und Wörterbuch des Klassischen Maya at the University of Bonn (Prager 2014). Thousands of hieroglyphs and millions of data points are available through these databases, which altogether build a significant foundation of raw data for continued study.

Improving access to a large corpus of data is vital to decipherment. The same complexity that makes palaeographic study of the hieroglyphs so compelling also hinders decipherment, but

ample materials increase the chances that scholars will identify textual relationships and expand our knowledge pool (Englehardt 2011; Houston et al. 2014; Lacadena 1995; Lacadena et al. 2017; Law 2015; Lounsbury 1989). Greater understanding of the languages underlying hieroglyphic inscriptions also eases remaining obstacles to decipherment wherein complex linguistic constructions may be recognized in the writing (Houston 2000; Houston et al. 2000; Law 2014:20; Law and Stuart 2017; Mora-Marín 2009; Wichmann 2004; Zender 2017). Even in the absence of a decipherment, however, the corpus supports the advancement of palaeography through analysis of traits such as scribal hand and of wider distributional patterns (Englehardt 2011; Giele 2005; Gronemeyer 2014; Lacadena 1995).



The basic methods of palaeography, being purely analytical and unbound from a specific cultural context, have already been and will continue to be applied to writing systems around the world. Previous scholarly examples from Sumer and China, among others beyond the scope of this article, laid the groundwork for cultural interpretation through palaeographic analysis. I am confident that continued attention to Maya script will be similarly fruitful in aiding interdisciplinary inquiry. Archaeological investigation and corpus building, both indispensable to the project of palaeography, also enable linguistic and cultural studies that contribute to a more complete picture of the Maya world: its structures, connections, and external influences.

In both the Old and New Worlds, the ultimate origin of writing remains in question. Evidence of Olmec, Zapotec, and Isthmian scripts predating that of the Maya — undeciphered but with apparent structural similarities — makes clear that the technology and perhaps the forms themselves were diffuse throughout central Mesoamerica, yet the precarity of material preservation complicates attempts to reconstruct a developmental trajectory across cultures. On this front, comparative corpus palaeography (to modify Kettunen’s expression) between multiple writing systems seems a logical course of action; as discussed above, however, the groundwork of corpus formation is complex and ongoing.

The success of Maya palaeography, like its Old World cousins in China and Sumer, rests on interdisciplinary coordination and scholarly willingness to adapt methodologies that have borne results elsewhere. In the spirit of cross-cultural comparison, let us use the common starting point of a script to trace the veins of change through these disparate civilizations.

### **Acknowledgments**

My gratitude to Maxime Lamoureux St-Hilaire, Harri Kettunen, and Carlos Pallan for their invaluable comments; and to my family for their patient enthusiasm.

## References

- Algaze, Guillermo  
2005 The Sumerian Takeoff. *Structure and Dynamics* 1(1).
- Bagley, Robert  
2004 Anyang Writing and the Origin of Chinese Writing. In *The First Writing: Script Invention as History and Process*, edited by Stephen Houston, pp. 190–249. Cambridge University Press, Cambridge.
- Boone, Elizabeth Hill  
2000 *Stories in Red and Black: Pictorial Histories of the Aztecs and Mixtecs*. University of Texas Press, Austin.
- Boone, Elizabeth Hill, and Walter D. Mignolo  
1994 *Writing without Words: Alternative Literacies in Mesoamerica and the Andes*. Duke University Press, Durham.
- Bottéro, Françoise  
2004 Writing on Shell and Bone in Shang China. In *The First Writing: Script Invention as History and Process*, edited by Stephen Houston, pp. 250–261. Cambridge University Press, Cambridge.
- Bricker, Victoria  
2007 Literary Continuities across the Transformation from Maya Hieroglyphic to Alphabetic Writing. In *Proceedings of the American Philosophical Society*, 151:pp. 27–42.
- Campbell, Lyle  
1988 Language in the Americas by Joseph H. Greenberg. *Language* 64(3):591–615.
- Cooper, Jerrold  
2004 Babylonian Beginnings: The Origin of the Cuneiform Writing System in Comparative Perspective. In *The First Writing: Script Invention as History and Process*, edited by Stephen Houston, pp. 71–99. Cambridge University Press, Cambridge.
- Daniels, Peter  
2018 *An Exploration of Writing*. Equinox Publishing, Sheffield.
- Englehardt, Joshua  
2011 Archaeological Epigraphy and Epigraphic Archaeology: Tracing Interaction, Innovation, and the Development of the Maya Script Through Material Remains. PhD dissertation, Department of Anthropology, Florida State University, Tallahassee, USA.
- Fash, Barbara  
2016 Corpus of Maya Hieroglyphic Inscriptions. *Peabody Museum of Archaeology and Ethnology*. <https://www.peabody.harvard.edu/cmhi/>.

Gelb, Ignace

1952 *A Study of Writing*. University of Chicago Press, Chicago.

Giele, Enno

2005 Signatures of “Scribes” in Early Imperial China. *Asiatische Studien: Zeitschrift der Schweizerischen Asien-gesellschaft* 59:353–387.

Gronemeyer, Sven

2014 The Orthographic Conventions of Maya Hieroglyphic Writing: Being a Contribution to the Phonemic Reconstruction of Classic Mayan. PhD dissertation, School of Historical and European Studies, La Trobe University, Bundoora, Australia.

Gu, Baotong

2009 *From Oracle Bones to Computers: The Emergence of Writing Technologies in China*. Parlor Press, West Lafayette, Indiana.

Houston, Stephen

1989 Archaeology and Maya writing. *Journal of World Prehistory* 3(1):1–32.

2000 Into the Minds of Ancients: Advances in Maya glyph studies. *Journal of World Prehistory* 14(2):121–201.

Houston, Stephen, Barbara Fash, and David Stuart

2014 Masterful Hands: Morelli and the Maya on the Hieroglyphic Stairway, Copan, Honduras. *RES: Anthropology and Aesthetics* 65/66:15–36.

Houston, Stephen, and Simon Martin

2016 Through Seeing Stones: Maya Epigraphy as a Mature Discipline. *Antiquity* 90(350):443–455.

Houston, Stephen, John Robertson, and David Stuart

2000 The language of Classic Mayan inscriptions. *Current Anthropology* 41(3):321–356.

Justeson, John

1989 The Representational Conventions of Mayan Hieroglyphic Writing. In *Word and Image in Maya Culture*, edited by William F. Hanks and Don S. Rice, pp. 25–38. University of Utah Press, Salt Lake City.

Justeson, John S., William M. Norman, and Lyle Campbell

1985 *The Foreign Impact on Lowland Mayan Language and Script*. Middle American Research Institute, Tulane University, New Orleans.

Kaufman, Terrence

1962 *Linguistic materials for the study of the internal and external relations of the Mayan family of languages*. Wenner-Gren Foundation for Anthropological Research, New York.

2017 Aspects of the lexicon of Proto-Mayan and its earliest descendants. In *The Mayan Languages*, edited by Judith Aissen, Nora C. England, and Roberto Zavala, pp. 62–111. Routledge, New York.

Kettunen, Harri

2014 Corpus Epigraphy: Linguistic Implications and Didactic Applications. *Contributions in New World Archaeology* 7:37–46.

Kramer, Samuel Noah

1949 Schooldays: A Sumerian Composition Relating to the Education of a Scribe. *Journal of the American Oriental Society* 69(4):199–215.

Lacadena, Alfonso

1995 Evolución Formal de las Grafías Escriturarias Mayas: Implicaciones Históricas y Culturales. PhD dissertation, Departamento de Historia de América II, Universidad Complutense de Madrid, Madrid, Spain.

2005 Historical Implications of the Presence of Non-Mayan Linguistic Features in Maya Script. European Maya Conference, Universiteit Leiden en Rijksmuseum voor Volkenkunde, Netherlands.

Lacadena, Alfonso, Albert Davletshin, and Philipp Galeev

2017 Paleography of Maya Hieroglyphic Writing. European Maya Conference, Malmö, Sweden.

Law, Danny

2014 *Language Contact, Inherited Similarity and Social Difference: The story of linguistic interaction in the Maya lowlands*. Current Issues in Linguistic Theory 328. John Benjamins, Amsterdam.

2015 Reading Early Maya Cities: Interpreting the role of writing in urbanization. In *A World with Cities, 4000 BCE – 1200 CE*, edited by Norman Yoffee, pp. 158–181. The Cambridge World History III. Cambridge University Press, Cambridge.

Law, Danny, and David Stuart

2017 Classic Mayan: An overview of language in ancient hieroglyphic script. In *The Mayan Languages*, edited by Judith Aissen, Nora C. England, and Roberto Zavala, pp. 128–172. Routledge, New York.

Lounsbury, Floyd

1989 The Names of a King: Hieroglyphic Variants as a Key to Decipherment. In *Word and Image in Maya Culture*, edited by William F. Hanks and Don S. Rice, pp. 73–91. University of Utah Press, Salt Lake City.

Macri, Martha

2017 Original Project 1990-2017. *The Maya Hieroglyphic Database*. <https://mayadatabase.faculty.ucdavis.edu/database/>.

Mora-Marín, David

2003 The Origin of Mayan Syllabograms and Orthographic Conventions. *Written Language and Literacy* 6(2):193–238.

2009 A Test and Falsification of the “Classic Ch’olti’an” Hypothesis: A study of three Proto-Ch’olan markers. *International Journal of American Linguistics* 75:115–157.

Nissen, Hans, Peter Damerow, and Robert Englund

1993 *Archaic Bookkeeping: Early Writing and Techniques of Economic Administration in the Ancient Near East*. Translated by Paul Larsen. University of Chicago Press, Chicago.

Prager, Christian

2014 Objectives. *Textdatenbank und Wörterbuch des Klassischen Maya*. December. <http://mayawoerterbuch.de/objectives/>.

Robertson, John

2004 The Possibility and Actuality of Writing. In *The First Writing: Script Invention as History and Process*, edited by Stephen Houston, pp. 16–38. Cambridge University Press, Cambridge.

Robinson, Andrew

2007 *The Story of Writing: Alphabets, Hieroglyphs & Pictograms*. 2nd ed. Thames & Hudson, New York.

2009 *Lost Languages: The Enigma of the World's Undeciphered Scripts*. Thames & Hudson, New York.

Trigger, Bruce

2006 *A History of Archaeological Thought*. 2nd ed. Cambridge University Press, Cambridge.

Wichmann, Søren

2004 *Linguistics of Maya Writing*. University of Utah Press, Salt Lake City.

2006 Mayan historical linguistics and epigraphy: A new synthesis. *Annual Review of Anthropology* 35:279–294.

Zender, Marc

2004 A Study of Classic Maya Priesthood. PhD dissertation, Department of Archaeology, University of Calgary, Calgary, Canada.

2017 Theory and Method in Maya Decipherment. *The PARI Journal* 16(2):1–48.