

VISIBLE LANGUAGE

the quarterly journal concerned with
all that is involved with our being literate

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Denise Schmandt-Besserat

The papers in this volume deal with the emergence of writing in Mesoamerica. They are intended to introduce the non-specialist to the best available knowledge about the decipherment of early Mesoamerican scripts and pre-literate symbolic systems, including those of the Olmecs, Late Formative cultures, Mayas and Mixtecs. The authors present the geography and chronology of each culture, describe the monuments or documents involved, and discuss their function and the methods used for de-coding symbols and signs. Each paper assesses what we know and what still needs to be learned about each particular system. *The Origin of Visible Language in the New World* is the second special issue of *Visible Language* devoted to the study of ancient scripts. The first issue, *Aspects of Cuneiform Writing*, was edited by Marvin A. Powell, Jr., in 1981. At the time, I contributed a paper on the immediate precursor of writing in the ancient Near East: "From Token's to Tablets: A Re-evaluation of the So-called Numerical Tablets." As a student of Near Eastern Writing, it is exciting to me to edit this volume and to observe how the two special issues complement each other in significant ways. First, they inform the reader about key research problems faced by Mesoamericanists and Assyriologists. Second, and more importantly, they show that in the New World, as well as in the Old World, writing was created to enhance the power of the ruling elite. However, each system functioned in a very different way. The Mesopotamian cuneiform texts dealt with economic data and brought control over the production of goods. The Mesoamerican symbols, displayed on monuments, served to legitimize rulers and their authority.

The papers contained in this volume were first presented at the fifth annual meeting of the Language Origins Society, held on August 10-12, 1989, at the University of Texas at Austin. I thank the College of Liberal Arts and the Center for Cognitive Science, the University of Texas at Austin, who sponsored the meeting. I owe special thanks to Carlota S. Smith, director, Center for Cognitive Science, and Peter F. MacNeilage, Department of Linguistics, who helped me in planning the meeting. I am indebted to the president of the Language Origin Society, Jan Wind, Free University, Amsterdam, for granting permission to publish the papers prior to their inclusion in the official proceedings of the meeting. I thank the six contributors for their good cooperation. In particular, I extend my gratitude to F. Kent Reilly III, who carried the burden of organizing the symposium and helped me as co-editor of this issue.

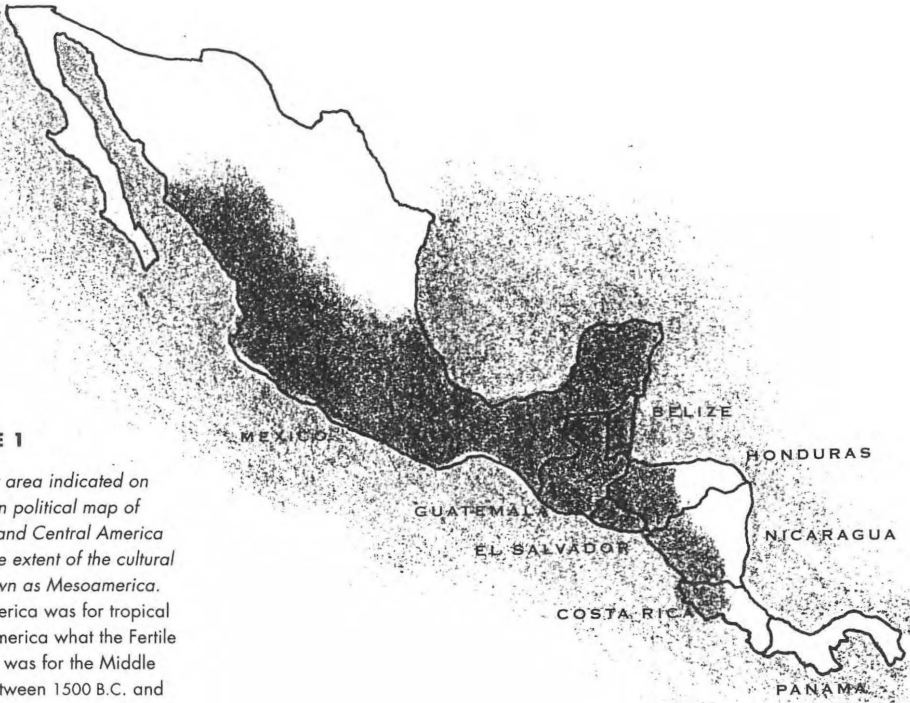
**DENISE
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Denise Schmandt-Besserat
Center for Middle Eastern Studies,
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March 1990

FIGURE 1

The grey area indicated on a modern political map of Mexico and Central America marks the extent of the cultural unit known as Mesoamerica. Mesoamerica was for tropical North America what the Fertile Crescent was for the Middle East. Between 1500 B.C. and A.D. 1521, Mesoamerican civilization produced a series of dynamic cultures which are the equivalent of the primal civilizations of the Old World.



F. Kent Reilly III and Brian Stross

The reader who turns to the anthropology and archaeology of ancient tropical America quickly comes to realize the need for acquiring a new geographical and temporal vocabulary. Terms such as “the Fertile Crescent” and “Upper and Lower Egypt” have no relevance for the geography of the New World. The dynastic sequences that anchor the history of the ancient Middle East are unrelated to the prehistory of North America. Instead, the high civilizations of Ancient North America developed in a cultural and geographical unit known as Mesoamerica.

Mesoamerica stretches from north central Mexico to the western half of El Salvador (*figure 1*). Within this diverse geographic area, the climate varies from the freezing slopes of volcanic mountain ranges that border the temperate valleys of the interior to the hot and moist Gulf coast and the somewhat dryer Pacific coast. The cultures that developed within this varied geography shared a series of common traits. Foremost among these traits was an agricultural system based on a staple triad of maize, beans, and squash. All Mesoamerican cultures measured time in an interlocking calendric system based on a 260-day ritual calendar and a 365-day solar (or agricultural) calendar. Calendric notations as well as astronomical information and historical records were recorded by Mesoamericans on bark-paper or leather books with hieroglyphic writing systems of varying degrees of complexity.

Ancient Mesoamericans played a ball game in a court with a solid rubber ball. They practiced a religion based on the worship of personified forces of nature and of their own ancestors. One of the major rites associated with this highly complex religious system was blood-letting. The act of bloodletting took place either through the ritual execution of prisoners captured in war or through autosacrifice. Almost all Mesoamerican cultures produced architectural works of distinction and almost all had population centers somewhat akin to the western concept of cities. Within these cities could be found large and highly organized markets which were supplied through extensive trading networks.

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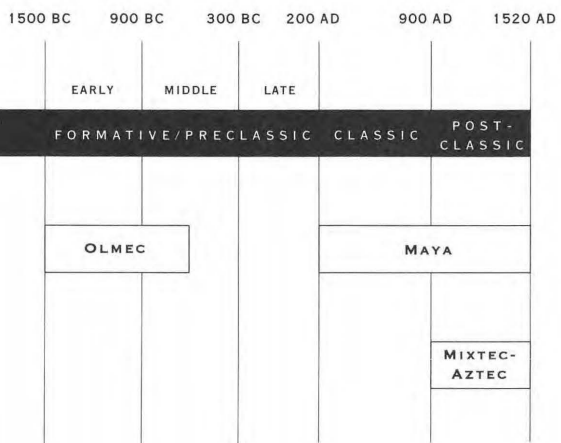
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The time frame for Mesoamerica can be divided into four periods. The Archaic Period (6,000–1500 B.C.) saw the development of settled village farming life. The Formative or Preclassic Period (1500 B.C.–A.D. 200) was highlighted by the development of Mesoamerica's earliest civilization and its first great art style: the Olmec. The Late Formative Period also saw the beginnings of those cultures that would dominate the succeeding Classic Period (A.D. 200–900). The Classic Period saw the flourishing of lowland Maya culture, which produced the most complex writing system in the New World. The Classic Period also witnessed the fruition and demise of the great urban center of Teotihuacan in the central Mexican highlands, as well as the apogee of Zapotec civilization in the Oaxaca valley city of Monte Alban. The Classic Period ended for the Maya with a mysterious collapse, the cause of which is still the subject of much scholarly debate. The Postclassic Period (A.D. 900–1520) saw the rise of Mixtec culture and was a time of increased militarism, dominated first by the Toltecs and finally by the better-known Aztecs. It was the conquest of the Aztecs by Spanish invaders in the sixteenth century that marked the end of the long-flourishing, purely indigenous Mesoamerican civilizations.

6000 BC

ARCHAIC



A dazzling variety of mutually unintelligible languages characterizes Mesoamerica; more than seventy of them are still spoken. Most belong to one of four families of related tongues. The Uto-Aztecan family includes Nahuatl (the language of the Aztecs) and Hui-chol as well as Tarahumara. Languages in this family are relative newcomers to Mesoamerica, visitors from the north (the United States) came late and stayed for the duration. Ancestors of the Aztecs, for example, did not reach central Mexico until Postclassic times.

Mixe, Popoluca and Zoque speakers, today located in and on the edges of the Isthmus of Tehuantepec in Mexico, constitute a family of Mixe-Zoquean languages having Olmec ancestry. Many languages in Mesoamerica have borrowed words from Mixe-Zoquean languages.

A far more diversified family, with roots extending much farther back in Mesoamerica than Mixe-Zoquean, is that of the Oto-Manguen languages. This family, including numerous tone languages, can be said to focus on the state of Oaxaca, Mexico, and includes Zapotec, Mixtec and Otomi.

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TIME PERIOD	LANGUAGE/ PEOPLE	SCRIPT	ARCHAEOLOGICAL SITE
FORMATIVE	OLMEC	ISTHMIAN	LA MOJARRA
CLASSIC	MAYA	MAYAN	KAMINALJUYU
POSTCLASSIC	OTOMI	MIXTEC	TIKAL
ARCHAIC	MIXE	OAXACA	MONTE ALBAN
PRECLASSIC		IZAPAN	

Approximately thirty Mayan languages exist, spoken in southeastern Mexico and Guatemala. These include Chol (which is directly descended from the language in which most of the Classic Maya inscriptions were written) and Yucatec (the language of the Postclassic Maya codices). Quiche is a highland Mayan language of Guatemala in which a very important Colonial Period text known as the *Popol Vuh* was written. This text, which might be called the "Bible" of the Quiche, documents the creation of the world as well as Quiche history and has played a prominent role in our interpretation of Classic Maya writings and iconography.

The river of time has witnessed in Mesoamerica the flowering of many cultures, the continuing diversification of many languages, and a great deal of interaction among the many peoples, their languages and their cultures. Symbol systems manifesting the ideologies of peoples in Mesoamerica through history have traveled individual paths, and our own glimpses of portions of these paths, including where they have led to today, allow us to reconstruct fascinating scenarios that with every new bit of evidence are more clearly delineated, more closely focused, more carefully refined.

Such is the framework of ancient Mesoamerica. The cultures that rose and fell over a three-thousand-year period were all products of Mesoamerican civilization. The material remains and art styles of these American cultures can hold their own with similar civilizations in the Old World. Although we are just now deciphering the writing and symbol systems of these ancient peoples, it daily becomes more apparent that the study of their history is as rewarding and intriguing as any other chapter documenting the human condition.

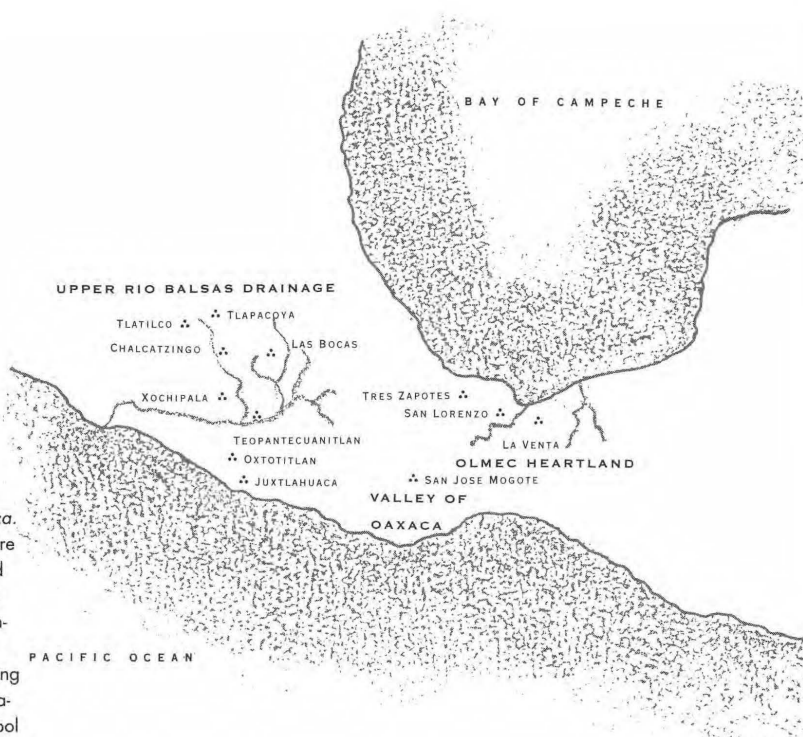


FIGURE 1

Map of central Mesoamerica. Olmec archaeological culture was centered in a heartland which was dominated by a riverine and coastal environment. Portable objects and monumental sculpture bearing themes, motifs and iconography of the Olmec-style symbol system are found not only in the Olmec heartland but in such other areas of Mesoamerica as the Upper Balsas River drainage, the Valley of Mexico, the Valley of Oaxaca and the Pacific coast. The wide geographic distribution of these portable objects and monumental sculpture indicates the presence of a Formative Period ceremonial complex the most concentrated expression of which was in the Olmec heartland.

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**COSMOS AND RULERSHIP:
THE FUNCTION OF OLMEC-STYLE SYMBOLS
IN FORMATIVE PERIOD MESOAMERICA**

F. Kent Reilly III

ABSTRACT

Iconographic investigations of works of art executed in the Olmec style have produced convincing evidence that rulership during the Early and Middle Formative Period of Mesoamerican prehistory was publicly legitimized by a visual charter. This charter consisted of symbols derived from the natural environment. These naturally derived symbols functioned within a symbol system which stressed the human ruler's access to supernatural power. The same symbol system also described the cosmic stage on which the rituals of rulership were enacted.

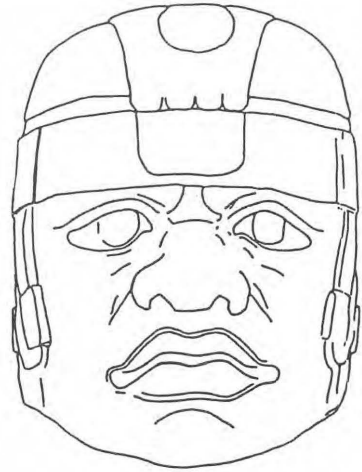
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Olmec civilization, flourishing in southern Mexico, is currently identified as the dominant cultural expression of Early and Middle Formative Period Mesoamerica (1500–500 B.C.). Olmec civilization is of paramount interest to scholars of the ancient Americas because it is viewed as an American equivalent to such primal civilizations in the Old World as Shang China, ancient Egypt and Mesopotamia. In order to understand how the Olmec-style symbol system can add new insights to current Olmec and Formative Period research, it is important to determine what is meant by "Olmec." Currently, Olmec is a label applied to both an archaeological culture and an early Pre-Columbian art style. The Olmec archaeological culture was centered in a geographic heartland stretching for some 150 miles along the southern bend of the Gulf of Mexico (*figure 1*). By 1100 B.C., along the many rivers and streams that crisscrossed this heartland, a number of sites had begun constructing the enormous earthen platforms and carving the altars and huge basalt heads that have become the hallmark of Olmec civilization (*figure 2*). The linkage of the archaeological Olmec with any of the ethnic groups existing in Mexico today is difficult. However, linguistic prehistorical reconstruction has recently made much progress in providing that linkage. Largely through the work of Terry Kaufman and Lyle Campbell, a large body of evidence has been compiled supporting the hypothesis that a branch of Mixe-Zoque was the language spoken in the Olmec heartland during the Formative period.¹

In contrast to the geographical limits of the Gulf coast Olmec archaeological culture, objects created in the Olmec art style are found throughout Mesoamerica. The heaviest concentrations of such objects, outside the Olmec heartland, are found in the Mexican highlands. Ongoing linguistic reconstructions by Kathryn Jossarand, Nicholas Hopkins and Terry Kaufman demonstrate that during the Formative period these highland areas were inhabited by a population speaking one of the many branches of the Otomanguan linguistic family.²

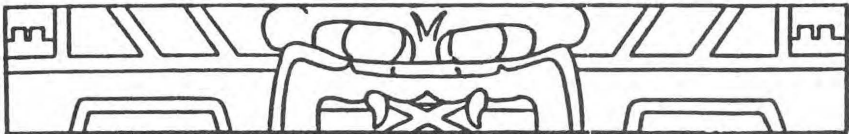
The pioneering Olmec scholar Michael Coe lists the major attributes of this geographically dispersed Olmec-style art as: a complex symbol system “based on a religion of the strangest sort”; a sense of monumentality, even in small objects; a tendency toward realism, and a compositional use of empty space.³ The many themes and motifs that make up the Olmec-style symbol system can be seen on portable items created in the mediums of wood, clay and stone and on monumental sculpture found far beyond the heartland.⁴ The precise mechanisms by which these symbols, and the objects on which they were depicted, spread throughout Meso-america are still unknown. Current anthropological thought favors an interaction sphere centered on a long distance trade network which can be archaeologically demonstrated.⁵ Within such an interaction sphere, lowland coastal products—such as marine shells, the feathers of tropical birds, and possibly cotton and cacao beans were exchanged for serpentine, obsidian and other stones from the highlands. Over the years several scholars, including Miguel Covarrubias, Carlo Gay and Gillett Griffin, have challenged the generally accepted heartland origin of the Olmec-style; and David Grove, the most recent excavator of the highland site of



double merlon

jaguar face

crossed bands

gum brackets
(ground line)

cave-like maw

(entrance to the underworld)

Chalcatzingo, has questioned whether artifacts known to originate from highland and Pacific coast Formative Period sites and bearing "Olmec-style" iconography should be classified as Olmec at all.⁶ I propose that such artifacts would be better classified as ritual objects which functioned in a geographically dispersed Formative Period ceremonial complex.⁷ The most concentrated expression of this ceremonial complex was in the Olmec heartland itself.

As previously stated, the placement of Olmec-style symbols on so many objects—found over so wide a geographical range—is currently explained in terms of an interaction sphere held together through long distance trade. Certainly, trade was a major factor in the geographical spread of the symbol system. However, long distance trade, in and of itself, is insufficient to explain the underlying ideology expressed through the symbol system. As we shall see, the specific nature of that ideology is still a matter of discussion. However, current research demonstrates that within the Formative Period Ceremonial Complex symbols and motifs functioned ultimately as a politically motivated communication system.⁸ Essentially the mission of the symbol system was to convey, define and sanctify the charter for rulership in the non-literate political landscape of early and middle Formative Period Mesoamerica. Functionally the symbol system operated by so ordering the individual motifs that they visually expressed the multi-leveled organization of the Formative Period cosmos or world view, when arranged within the consistent patterns which are analogous to syntax in language.⁹ The consistency of these symbolic patterns allowed individuals who were literate in the symbol system, no matter what their language, to recognize that the rulers who displayed these symbols were publicly proclaiming the supernatural source of their power. These same symbolic patterns also described the supernatural elements contained within the cosmos as the stage on which the rituals of rulership were enacted. Access to this supernatural power allowed these rulers to function both as the *axis-mundi* that united the different levels of the multi-leveled cosmos and as the fulcrum on which the basic oppositions of the cosmos were balanced and renewed.

Though many of the motifs that make up the Olmec-style symbol system probably predate the symbol system itself and may well originate outside the heartland area, the earliest examples where they function within a coherent system are on the altars that are a hallmark of the archaeological Olmec culture (figure 3). Many of these altars are stylistically dated to the Early Formative Period (1500–900).¹⁰ They are now functionally recog-

FIGURE 2

Monument 1, San Lorenzo. Among hallmarks of the heartland Olmec culture are the monumental heads carved from basalt. Monument 1, or "El Rey" as it is more commonly known, from the heartland site of San Lorenzo, is the second largest of this genre, standing 2.85 meters high and weighing some 12 tons.

(After Beatriz De La Fuententia. 1975. "Las Cabezas Colosales Olmecas." *Colección Testimonios del Fondo 34*: 52. Fondo de Cultura Económica, México).

FIGURE 3

Altar 4, La Venta. Olmec altars are another hallmark of heartland Olmec culture. Functionally, these altars were the seats or thrones of Olmec rulers. Currently, the earliest evidence of Olmec-style symbols functioning as a system is on these thrones. On Altar 4, the line of the earth is indicated by the gum brackets of the earth monster. The world mountain, or axis-mundi atop which the living Olmec ruler would have been seated, is the jaguar face whose mouth is marked with a crossed band. Emerging from the cave entrance to the underworld is a portrait of an Olmec ruler carved in very high relief—almost three dimensional—who wears an harpy eagle headdress. This portrait figure was most likely an ancestor of the heartland Olmec ruler who commissioned La Venta, Altar 4.

(After Grove. 1973. "Olmec Altars and Myths," 131.)

nized as the seats or thrones of Olmec rulers,¹¹ and it makes sense that these thrones would also be used to convey the iconography of rulership. The fact that these thrones carry this iconography would certainly support a heartland origin for the Olmec-style symbol system. However, recent developments suggest that certain motifs—such as the cruciform shaped quatrefoil (see figure 6a)—that play a prominent role in the symbol system originated in highland areas.¹²

Much of the value of portable objects executed in the Olmec-style in the mediums of jade, green stone, basalt magnetite, shell, clay and wood must have been in their ability to convey the iconography of the ideology represented by the symbol system. The right to publicly display and manipulate this symbol system may have been the motivation for elite participation, throughout Mesoamerica, in the Formative Period ceremonial complex, and in the interaction sphere which the ceremonial complex stimulated.

WERE JAGUARS
AND OLMEC ORIGINS

Currently, the interpretation of Olmec-style symbols is grounded on a series of hypotheses formulated by the Mexican artist and ethnographer Miguel Covarrubias, the American archaeologists Matthew Stirling and Michael Coe, and Coe's student David Joralemon.¹³ Covarrubias saw within the corpus of Olmec-style art, images that appeared to be composites of human and jaguarian features of "were jaguars." Covarrubias interpreted these "jaguars" as ancestral precursors of the rain deities and water complexes of Mesoamerican cultures which had flourished in the Classic (A.D. 200–900) and Post-Classic (A.D. 900–1520) periods.¹⁴ Matthew Stirling postulated that the "were jaguar" images within Olmec-style art were artistic representations of the supernatural offspring of a union between a male jaguar and a human female. Stirling further conjectured that the Olmecs considered themselves to be the descendants of such a union.¹⁵ The Olmecs, he reasoned, immortalized their origin with the use of jaguar-derived motifs in their art. Michael Coe was the first to structurally analyze Olmec iconography with the intent of determining the origin of the belief systems of later Mesoamerican cultures.¹⁶ Joralemon, working from Coe's hypothesis, used motif patterns to construct an Olmec pantheon containing ten major deities.¹⁷

Though several Olmec investigators in the 1960s and 1970s recognized that many of the images that were then identified as "were jaguars" were in fact repre-

sentations of animals outside the feline category, it was an article by Michael Muse and Terry Stoker that first brought this knowledge to a wider audience.¹⁸ In an expanded version of this original article, Terry Stocker, Sarah Meltzoff and Steve Armsey hypothesized an origin for Olmec-style symbols within the fauna of the Mexican Gulf Coast.¹⁹ This hypothesis concluded that Olmec religion was based on the worship of natural phenomena, more specifically the cayman and other saurians that were once a dominant predator and a major food source in the riverine and swampy environment of the Olmec heartland.

POWER SYMBOLS
AND THE NATURAL
ENVIRONMENT

The revelation that symbols of power derive from the natural environment is not unique to the archaeological Olmec—or to the New World, for that matter. The ecological origin of symbols has been recognized as a significant factor in the development of ideologies and their visualizing symbol systems in many areas of the world. The work of Ake Hultkrantz, an anthropologist and religious iconographer, has shown that individual elements of religious belief in such societies derive from the interaction of human groups with their natural environments. Hultkrantz finds that this interaction provides a given human group with the specific visual images, ceremonies and concepts by which the religious beliefs of the community are publicly made manifest: “In enactment of the rites the priests, dancers or other persons often make use of objects associated with purpose in view; i.e., in animal rites, horns, feathers, and hides of the animal which is supplicated....”²⁰ Hultkrantz further hypothesizes that the way the community interprets its mythological base, and the means by which this base is used to interpret the community’s socio-political structure, is determined by characteristics and powers which the community recognizes in its own natural environment.

Abner Cohen, in an essay on power and symbols, suggests that those very same symbols which Hultkrantz identified as the base with which a community combines mythological structure “are nearly always manipulated, consciously or unconsciously, in the struggle for and maintenance of power between individuals and groups.”²¹ As we shall see, within the Formative Period ceremonial complex, Olmec-style symbols serve a similar purpose in that they are purposefully manipulated in providing a rulership charter for the elites in the Olmec heartland and other areas of Formative Period Mesoamerica.

The fauna and flora of the natural environment provided the source from which the heartland Olmec and other Formative Period societies generated the symbolic metaphors with which they described the visual cosmos and the reality of a supernatural otherworld. In other words, Olmec-style symbols, having their source among the fauna and flora of the natural environment, are being aggregated as symbolic elements to express supernatural zoomorphs, deliberately removed from the naturalistic or phenomenological image.

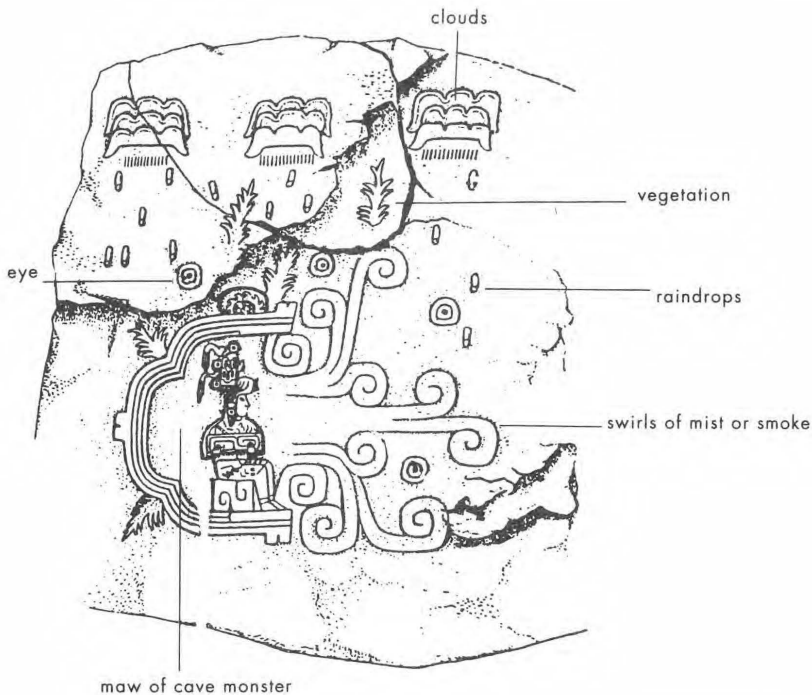
David Joralemon concurs with this concept of the natural symbol used as metaphor, and states, "The primary concern of Olmec religious art is the representation of creatures that are biologically impossible. Such mythological beings existed in the mind of man, not in the world of nature. Natural creatures were a source of characteristics that could be disassociated from their biological context and be recombined into non-natural forms."²² Joralemon was one of the first to identify the Formative Period cosmos as a layered reality consisting of the heavens, the earth and the underworld. He interprets the dragons, which he sees as the principal image of Olmec-style iconography, as biotic supernaturals inhabiting one or another of the three cosmic levels.²³ Because they are supernaturals, Joralemon's "dragons" pass at will from one level of the cosmos to the other.

ROYAL PORTRAITURE
AT THE INTERFACE
OF NATURAL AND
SUPERNATURAL REALMS

The art historian Linda Schele, in her search for the origins of the Maya belief system, has developed a synthesis of phenomena and metaphor which has proved to be pivotal in our understanding of the function of the Olmec-style symbol system.²⁴ Schele, as have Michael Coe, Peter Furst and David Grove, interprets Olmec art as a political statement.²⁵ Like Joralemon and others, Schele sees an iconographic process developing within Olmec-style art which expresses rulership charter in iconographic elements derived from nature, a convention she believes remains fundamentally unchanged throughout the long cultural history of Mesoamerica. Within the Schele hypothesis, the Olmec-style symbols are used to visibly position the Formative Period rulers at the intersection, the ruler becomes the interface between the natural and supernatural realms. Taking this hypotheses to its logical conclusion, Schele suggests that Olmec-style art, when it portrays the images of rulers, often functions dually as

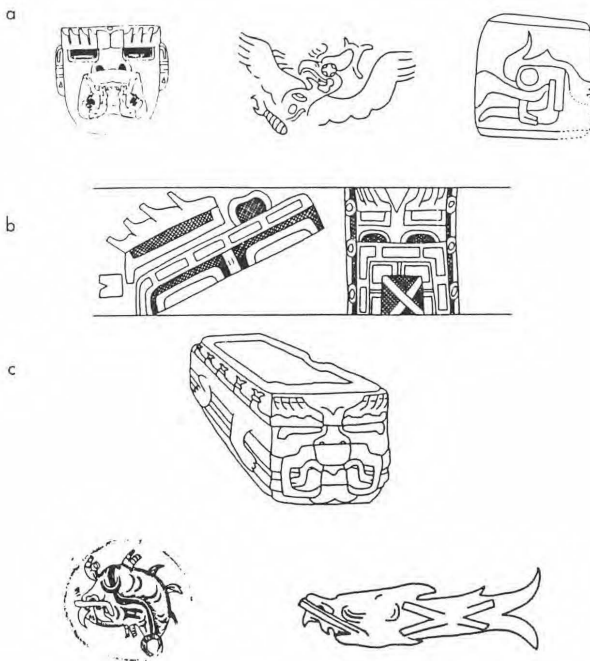
FIGURE 4

Relief 1, Chalcatzingo.
Relief 1 is a bas-relief carved on the slopes of the Cerro Chalcatzingo. Relief 1 depicts an elite personage seated in the mouth of a zoomorphic earth monster. Positioned at the junction of the natural and super-natural realms, it is the ritual action of the seated figure which brings the rain that can be seen falling from the tri-layered clouds above. That rulers functioned as the interface between the natural and the supernatural must have been one of the fundamental ideological tenets of the Formative Period ceremonial complex. (After Coe, 1965. "The Olmec Style and Its Distributions," figure 10.)



royal portraiture and as the visual image of the interface between two realms of perceived reality.

A striking portrayal of a Formative Period ruler in his role as the interface between the natural and supernatural is the subject of Relief 1 at the highland site of Chalcatzingo (*figure 4*). Relief 1, a drastically carved bas-relief in the Olmec-style high in the talus slope of an eroded volcanic core, depicts a personage dressed in a tall headdress and long tunic. This elaborate, costumed figure is seated on a throne incised with a Lazy-S scroll; in his arms, he holds a ceremonial bar also bearing a Lazy-S. The configuration which surrounds this seated elite personage is the cave-like mouth of the zoomorphic earth monster. By placing this human image—most probably a depiction of the founder of the Chalcatzingo ruling lineage—in the mouth of this zoomorphic supernatural, the artist has defined his location as the junction of the natural (represented by the human figure) and supernatural worlds (represented by the zoomorphic supernatural in whose mouth he sits). Above these interacting images of the human ruler and supernatural earth monster, exclamation-point-shaped raindrops fall from triple-layered clouds onto maize plants or other forms of vegetation.

**FIGURE 5**

The Olmec-style cosmic symbols: the symbolic representation of the Formative Period multi-levelled cosmos.

a. For the Olmec as well as other Mesoamericans, the cosmos was structured in three levels: earth, sky and underworld. The sky was symbolized by avian zoomorphic supernaturals.

(After Joralemon. "In the Olmec Dragon," figure 20, a, b and j).

b. The earth was a crocodilian-derived supernatural who was also associated with rulership, water and vegetative fecundity.

(After Joralemon. "A Study of Olmec Iconography," figures 120 and 145.)

c. The underworld, symbolized by shark supernaturals and other underwater zoomorphs, was an underwater location and the source of ancestral power and fertility.

(After Joralemon. "The Olmec Dragon," figures 4f and 5d.)

The great scrolls of smoke or mist that emerge from the open mouth of the earth monster provide, within the Mesoamerican cosmic scheme, the source of the rain and the clouds from which they fall.²⁶ The thematic purpose of this monumental relief is to demonstrate that the central human figure is responsible, through ritual action, for that nourishing rainfall. According to the Schele hypothesis, by recording this ritual in stone, the Formative Period rulers of Chalcatzingo have publicly chartered their right to rule—creating a permanent record of their supernatural ability to ensure those rains which were essential for the sustaining of life in this somewhat arid area of highland Mexico. Stated in another way, Chalcatzingo Relief 1 is a representation of the dyadic concept of oppositions: the ruler, seated at the interface between the natural and the supernatural, is the precisely placed fulcrum on which the rainy and dry seasons are balanced; in other words *the ruler insures natural harmony*. By being the ruler, as well as in order to rule, the ruler must function thus.

In Schele's view, the symbolic representation of a multi-layered Formative Period cosmos reflects not only the physical divisions of reality into the underworld, the earth and the sky but the metaphors which these ancient Mesoamericans chose to visually describe the dyadic oppositions which are inherent in

any comparison of the natural and supernatural worlds. These oppositions of natural and supernatural are constantly overlapping in the iconography of four categories of zoomorphic supernaturals.

As Schele points out, these categories—creatures that swim, that crawl, that walk and that fly—constantly overlap. Supernatural zoomorphs developed from predatory swimming creatures, such as gars and sharks, are metaphors for the silent and underwater realm of death, fertility and ancestral power (figure 5a). The zoomorphic images derived from crawling and slithering creatures, such as snakes or iguanas, can move on the surface of the earth, live in the earth or enter the water—and, thus, are intercessors between the realms. The earth itself is the great saurian-derived earth monster supernatural whose open maw is so prominently displayed on Chalcatzingo, Relief 1 (figure 5b). The earth is also the domain of the human ruler and his most powerful “nagual” or spirit companion, the jaguar.²⁷ As has been discussed above, on the earth the human ruler occupies a dual position as both *axis-mundi* and interface between the natural and supernatural orders. Finally, the domain of the sky is metaphorically defined by zoomorphs derived from powerful raptors such as the harpy eagle and the osprey. Diving out of the sun, these great birds of prey devour fish, inhabitants of an underwater underworld, and monkeys, near-relatives of man and survivors of a previous creation in the Mesoamerican

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FIGURE 6

Monument 9, Chalcatzingo, double merlons and cleft motifs: the symbols of the cosmic portal. Portals between the three cosmic levels and between the natural and the supernatural realms inherent throughout that cosmos could be symbolized by the open maw of the earth monster, by such geometric shapes as the double merlon or by the cleft which was usually shown splitting the heads of Olmec-style supernaturals.

(After Grove. *Chalcatzingo: Excavations on the Olmec Frontier*, figure 8; Reilly. 1989. *Joralemon*. 1971. “A Study of Olmec Iconography,” figure 165.)

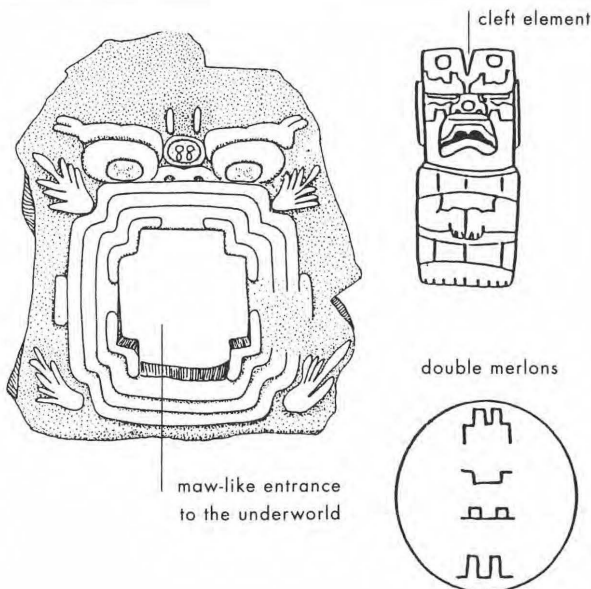
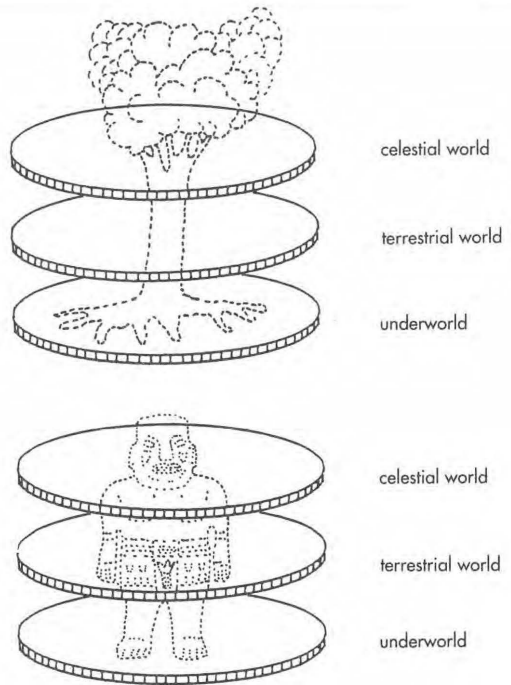


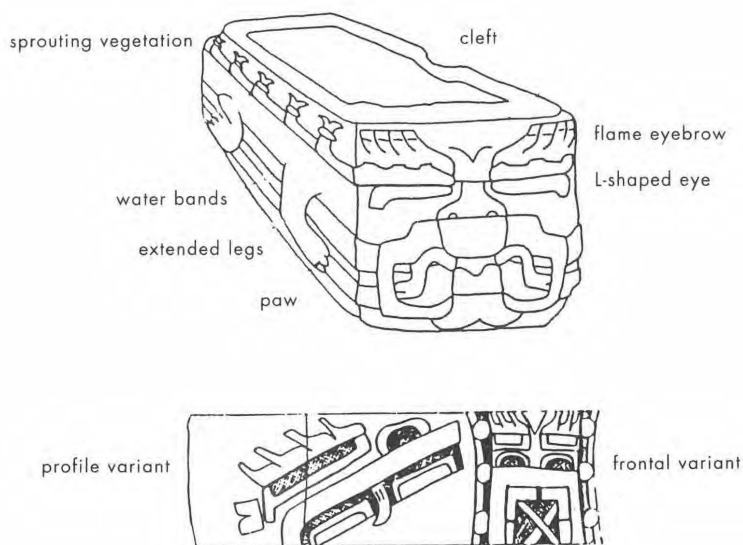
FIGURE 7

The cosmic axis and political charter. The central axis of the tri-leveled Formative Period cosmos was symbolized by a sacred mountain or a world tree. Political charter for the heartland Olmecs and other participants in the Formative Period ceremonial complex was visualized by turning the ruler into the central cosmic axis.



view (figure 5c). Portals between the cosmic levels symbolized by these zoomorphic supernaturals and between the natural and the supernatural realms that are inherent throughout the entire cosmos could be artistically represented as the gaping maw of the Olmec earth monster depicted on Relief 1 at Chalcatzingo, by Chalcatzingo, Monument 9, and by such motifs as the V-shaped cleft and the “double merlon” (figure 6). More often than not, the three levels of the cosmos were linked by an *axis-mundi* (figure 7). This *axis-mundi* took the form of a world tree, a sacred mountain of the Formative Period ruler who presented himself as the *axis-mundi* through the metaphor of the world tree or by incising the cosmic levels on his images and, most probably, tattooing them on his body.²⁸

The manipulation of these zoomorphic themes and symbols endowed the ruler who manipulated them with the visually symbolic motifs that sanction his rulership. In other words, when a sanction of rulership, visually based on the powers of nature, is metaphorically metamorphosed into a supernatural image, the holder of that sanction can then manipulate his person as well as his power into the realm of the supernatural.

**FIGURE 8***The Olmec-style earth monster.*

a. Monument 6, La Venta. On this sandstone sarcophagus, the earth monster is depicted in a posture assumed by floating crocodilians. On this creature's back can be seen the earth's sprouting vegetation.

b. *Tlapacoya Vessel*. The two incised images on this rollout of a pottery vessel from a Formative Period site in the Valley of Mexico depict profile and frontal variants of the Olmec-style earth monster. Both of these earth monster representations present the major identifying motifs of the all-important Olmec-style earth monster theme: L-shaped eyes, flame eyebrows, gum brackets and cleft elements.

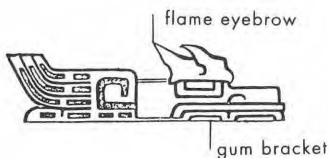
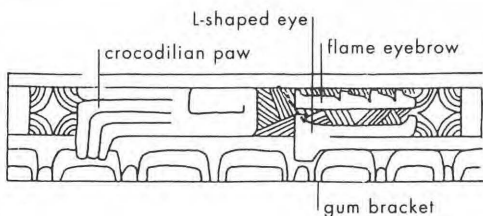
(After Joralemon. 1971. "A Study of Olmec Iconography," figures 145 and 120.)

cosmic model, the terrestrial image or earth monster (Joralemon's Olmec dragon) is ubiquitous. One of the most dramatic artistic depictions of this earth monster is a large sandstone sarcophagus (2.8 m. long, 0.96 m. wide and approximately 0.86 m. high) excavated at the heart-land site of La Venta (*figure 8a*). The sides of this sarcophagus (La Venta, Mon. 6) were so carved that the entire monument was to be perceived as a crocodilian-derived zoomorphic representation of the earth. The creature itself is depicted floating on water bands with its legs extended out and down from its body, a posture identical to that of a partially submerged crocodilian. Other crocodilian attributes depicted in this specific sculptural composition include the bifurcated or cleft browline, the flame or flanged eyeridges and the emphasized upper fangs.²⁹ The split-stemmed plants emerging along the back of this zoomorph make certain its identity as the earth monster who functions as the surface of the earth. The forked tongue emerging from this earth monster's mouth emphasizes that the earth monster, like all Olmec-style zoomorphs, is a composite creature, in this instance a by-product of the fusion of the snake and the crocodilian into one supernatural image. The choice of actual creatures from which this zoomorph has been created can probably be attributed to the fact that crocodilian locomotion in the water is provided solely by its massive tail. The crocodilian, seen swimming under

water, resembles nothing so much as a giant swimming serpent.

The behavioral pattern that most closely explains the seemingly bizarre association of crocodilians with earth and vegetation is "water dancing."³⁰ It is common knowledge that the bellowing of male crocodilians is often mistaken for thunder. In fact, thunder can trigger their bellowing; they have even been known to bellow in response to the sonic boom of the space shuttle.³¹ Such an action in itself could associate crocodilians with rain and, thus, vegetative fertility. But the act of water dancing is even more astonishing. The male crocodilian will belly-down in shallow water, arch his head and tail out of the water (sometimes wagging the heavy tail like a dog) and, with his mouth clamped shut, force air into his throat pouch, causing it to vibrate. Then, as Ackerman has described it, "The water suddenly dances high all around his body in an effervescent fountain full of sparkle in the sunlight, and a thundering bellow fills the air like distant war games."³² Another researcher has described the same effect, less poetically but just as accurately, as looking like a struck tuning fork placed into a pan of water.³³ So one of the reasons for associating crocodilians with vegetative fertility is based on what is, in effect, sympathetic magic; crocodilians possess the ability to call thunder and bring down the rain.

I would think that this crocodilian association with the carved image on the La Venta sarcophagus would be most easily challenged, by the casual observer, because of the flat, almost bulldog appearance of the face of the zoomorphic image depicted there. However, an examination of an incised pot dating to the Formative Period and executed in the Olmec-style presents a visual explanation (*figure 8b*). This vessel, excavated at the site of Tlapacoya in the Valley of Mexico, has a frontal-faced zoomorphic image incised on one side and a profile view of the same zoomorph on the other. The craftsman who created this vessel handled what is, in fact, a dual problem in perspective and an uncertainty of viewer recognition by showing the earth monster in both profile and frontal variants. The sculptor who carved the La Venta sarcophagus was restricted from rendering a similar effect by his inability to convey perspective and by the overall purpose of his composition. Both of the images on the Tlapacoya vessel share with the zoomorph from the La Venta sarcophagus similar crested eyeridges (flaming eyebrows), L-shaped eyes and other attributes which Joralemon had carefully analyzed and categorized as attributes of his Olmec dragon, the earth monster of the Formative Period ceremonial complex.³⁴



gum bracket as ground line

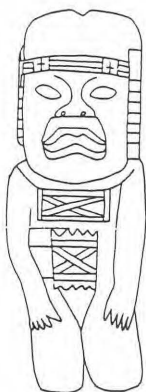
FIGURE 9

The bracket gum markings of the Olmec-style earth monster. These two rollouts from pottery vessels from the Valley of Mexico, Early Formative Period site of Tlatilco illustrate the prominent function of the gum bracket in *pars pro toto* representations of the Olmec-style earth monster. These gum brackets would come to symbolize the line of the earth on Middle Formative Period Olmec-style sculptural compositions, as in the rock carving from San Isidro Piedra Parada, El Salvador, at the bottom of the figure.

(After Joralemon. 1971. "A Study of Olmec Iconography," figures 13 and 101.)



Chalcatzingo, relief 2



Las Limas figure



San Lorenzo, mon. 52

FIGURE 10

The crossed bands motif. The crossed bands are a prominent Olmec-style motif often used as a body marking on such supernatural zoomorphs as the one depicted in Chalcatzingo Relief 2 and as belts and pectorals on anthropomorphic figures like the one held in the lap of the Las Limas figure and on San Lorenzo Monument 52.

(Joralemon. 1971. "A Study of Olmec Iconography," figures 244, 202 and 211.)

Two iconographic motifs that the Tlapacoya and La Venta earth monster do not share are the bracket gum markings and the crossed bands located in the mouth of the frontal-faced image on the Tlapacoya vessel. Bracket gum markings are a standard replacement for all dentition on depictions of the zoomorphic earth monster except for those instances when descending fangs are indicated (figure 9). Crossed bands are a motif that carries over into the Maya iconographic system. The exact meaning of crossed bands continues to be a matter of debate. In Maya iconography, crossed bands are often seen in sky associations. If crossed bands do carry this symbolic meaning, then they would symbolize the center of the sky. However, within the overall corpus of Olmec-style art, the crossed bands have no discernible sky associations. The most frequent depictions of crossed bands in Olmec-style art are humans and supernaturals in the form of a pectoral or as the front piece on a belt or sash worn by humans and anthropomorphic supernaturals, and as a body marking on zoomorphic supernaturals (figure 10).

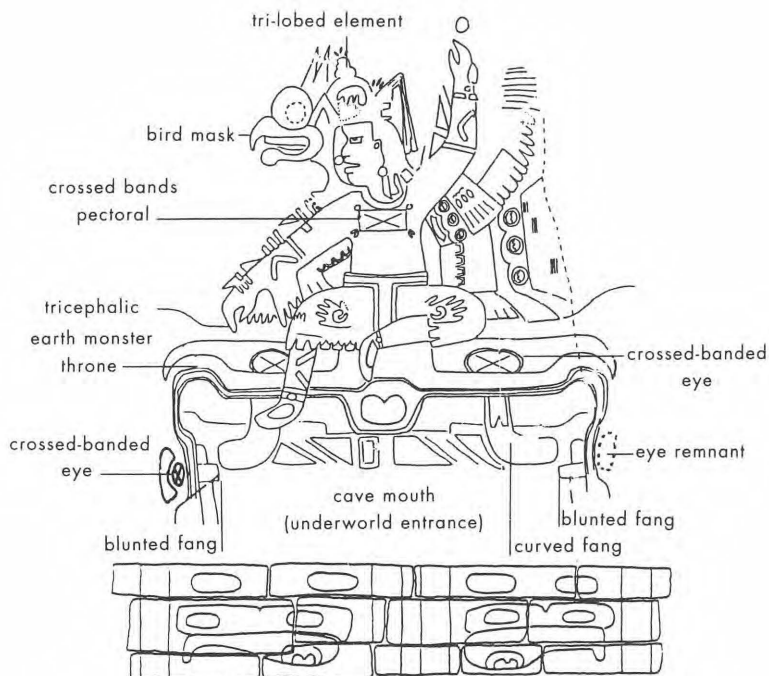
I propose that the crossed bands motif occupies a central position in the iconography of Formative period rulership because it functions as a symbolic locative which identifies the wearer (zoomorph or human) as standing at the center of the cosmic order. To test this hypothesis, it is necessary to structurally examine and compare several of the many Olmec-style works of art on which this motif is predominantly displayed.

Certainly, the elaborately costumed personage depicted in Mural 1 painted on a cliff face above the north grotto at Oxtotitlan cave is wearing a square pectoral incised with crossed bands, the ends of which are marked with what may well be cleft vegetation symbols. Oxtotitlan, Mural 1 falls into one of two classes of art works that display the image of the Formative Period ruler in his role as *axis-mundi*. As previously described, such representations generally take two forms: either the symbols of the cosmic levels are incised on the human image or the human image is displayed as the world tree. Oxtotitlan is an example of the former. The polychromed mural is large (3.8 meters wide by 2.5 meters high) and remarkably well preserved considering that it has been exposed to the elements for some 2,700 years. This mural is one of a series of paintings executed in the Olmec style that are located in what is a series of shallow grottos near the city of Chalpancingo in the Mexican Pacific coast

FIGURE 11

a. Mural 1, Oxtotitlan is an Olmec-style painting depicting an enthroned human figure who wears a feathered costume and an elaborate bird mask.
 b. At Oxtotitlan, the tricephalic zoomorphic throne, on which the masked human figure sits, closely resembles the throne located in the sunken patio at Chalcatzingo.
 The function of Oxtotitlan mural 1, which is strategically positioned over a grotto mouth, is to depict a Formative Period ruler as the cosmic axis: his tricephalic throne functions as both a metaphor for the terrestrial realm and as the framing device surrounding the portal of the supernatural under or otherworld. The grotto, located directly beneath the mural, is the physical manifestation of this portal. The avian mask worn by the ruler functions symbolically as a representation of the sky realm and as public documentation of the ruler's inherent ability to cross the supernatural portal above which he sits. The ruler's pivotal position at the center of the cosmos is symbolically demonstrated by the crossed bands pectoral he wears on his chest.

(After Grove, David C. 1969: figure 2. "Olmec Cave Paintings: Discovery from Guerrero, Mexico." In *Science*, Volume 164, number 3878, pp. 421-423, Washington, D.C., the author, drawn from a photograph.)



proposed reconstruction of the altar (Mon. 22) found in association with the sunken patio at Chalcatzingo.

state of Guerrero, first brought to the attention of the scientific community by David Grove.³⁵ Oxtotitlan and Juxlahuaca cave, also located in Guerrero, are the only examples of Formative Period compositional paintings to survive the ravages of time.³⁶

CEREMONIAL MARKINGS

Oxtotitlan, Mural 1 has been lovingly reconstructed by the Mexican artist Felipe Davalos. The mural depicts an elaborately costumed human figure seated on a throne which takes the form of the zoomorphic earth monster. The upper and horizontal face, on which the human figure sits, is the best preserved of the three. The other two zoomorphic faces appear to function as the legs of this throne. Originally there may have been a fourth face positioned horizontally at the base of the composition between the two vertical faces. If this was the case, the zoomorphic throne would have been a quatrefoil construction. Unfortunately, time and weather have erased

all traces of it. Each eye of the upper horizontal zoomorphic face is marked by a crossed bands and is framed by a distinct set of "flame eyebrows." The flame eyebrows depicted on the zoomorphic throne in the Oxtotitlan mural are strikingly similar to those incised on the surface of an actual throne uncovered in a sunken patio at Chalcatzingo (*figure 11b*).³⁷ However, no mouth is depicted on the Chalcatzingo throne, while from the upper jaw of the Oxtotitlan zoomorph two outward curving fangs descend.³⁸ Between these two fangs runs a striped horizontal band reminiscent of the upper register of La Venta, Altar Four (*see figure 3*). The two zoomorphic faces that serve as the legs of this throne are obscured through erosion and mineral deposits. However, the face on the mural's right has at least one distinct eye marked with crossed bands and a blunted fang descending from its jaw. The zoomorphic face on the left is even less distinct, but a blunted fang is clearly visible.

The placement of Oxtotitlan, Mural 1 directly above the south grotto indicates that the mural functions as a billboard identifying the ritualistic and supernatural function of the grotto itself. It may very well be that the tricephalic throne monster painted above the grotto is a zoomorphic representation of the grotto as the portal between the natural and supernatural. Certainly, this is an image that corresponds both thematically and visually with Chalcatzingo, Relief 1. At Chalcatzingo, water, after a rainstorm, cascades down from the peak above and flows directly in front of Relief 1 down to the fields below. At Oxtotitlan, Grove reports that in times past, the grotto contained lagoons of water during the rainy season; on occasion these lagoons would overflow the mouth of the grotto and water would, as at Chalcatzingo, cascade into the fields below.³⁹ The occurrence of the same natural phenomenon at both sites would also explain a similarity in their ritual functions. At Chalcatzingo a bas-relief depicts a human figure within a zoomorphic cave performing the ritual necessary to achieve the interface between the natural and the supernatural. The result of that interface is life-sustaining rain. At Oxtotitlan the medium is paint, not carved stone, but the thematic content is the same—only here the grotto itself is identified as the physical location where the rituals necessary to achieve that interface were performed.

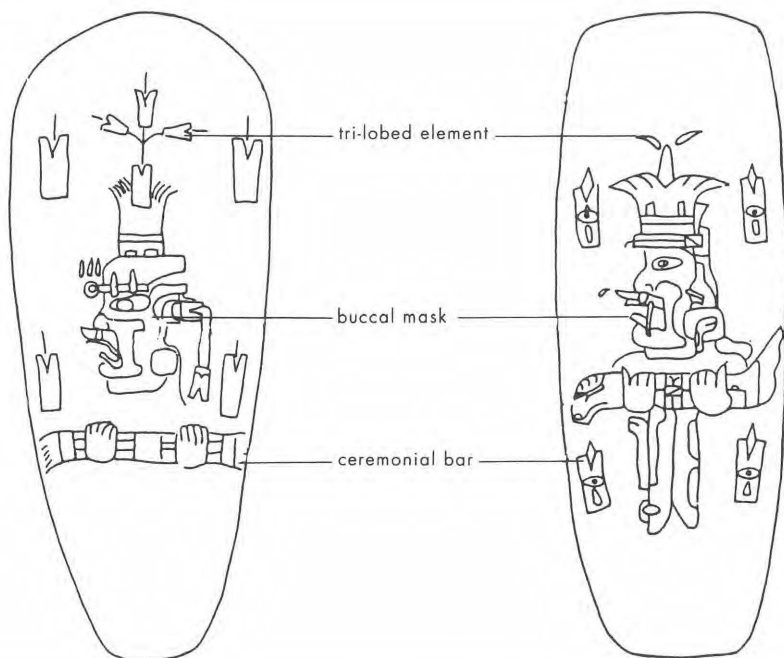
The most striking article of costume worn by the human figure seated on the throne is an elaborate bird helmet or mask which appears connected to an elaborate feather cape. Part of the mask is cut away in order

to give an X-ray view of the human face beneath, thus making sure that the viewer fully understands that he is seeing a human and not a zoomorphic supernatural. The prominently curved beak of the mask identifies the species of bird depicted as raptorial. The iris of the large round eye has been hollowed out, and Grove suggests that it "once held an object such as a piece of jade or a polished magnetite mirror."⁴⁰ The function of Oxtotitlan, Mural 1 is to offer a visual representation of the human ruler as *axis-mundi* in a multi-tiered cosmos and as the interface of dyadic oppositions of the natural and supernatural that are inherent in the composition of that cosmos. The terrestrial realm is symbolized by the human figure whose attributes are clearly distinguished through the use of the cut-away mask. The supernatural underwater or other-world is the frequently water-filled grotto whose zoomorphic representation—the tricephalic throne painted above the entrance—serves as the throne in the composition painted above its mouth. The raptorial bird mask and costume functions doubly as a symbol for the celestial realm and as a metaphor for the human wearer's ability to fly across the portal (the grotto itself) that both links and separates the natural and supernatural realms.⁴¹ The motifs that identifies the human figure as both the central axis of this cosmological construct and as the fulcrum on which the natural and supernatural oppositions balance and interface are the tri-lobed motif emerging from the top of the bird mask and the crossed bands pectoral so prominently displayed on the wearer's chest. The underworld is the grotto which forms the mouth of the earth monster throne and out of which flows life-giving water. The celestial realm is conveyed through the great raptorial bird mask. The motif that identifies the human figure as the central axis and as the centrally placed fulcrum on which natural and supernatural oppositions balance is the crossed bands so prominently displayed on the human wearer's chest.

On Oxtotitlan, Mural 1, the human figure is identified as the *axis-mundi* in a multi-tiered cosmos because he wears costume details and is seated on and above symbolic motifs functioning as the metaphors that describe that cosmos. In Oxtotitlan, Mural 1, the crossed bands are explicitly displayed so that their message is clear and unequivocal. On a jade celt from the site of Arroyo Pesquero in the Olmec heartland, the crossed bands motif is implicit, but its symbolic meaning is just as clear and unequivocal as its representation in Oxtotitlan, Mural 1.

Incised on the surface of the Arroyo Pesquero jade celt is a human figure wearing a tall headdress and a buccal mask, and carrying in his arms a ceremonial bar that appears serpent-like but whose zoomorphic composition is betrayed by its flame eyebrows (*figure 12a*). Around this standing figure are placed four cleft rectangular elements. The headdress worn by the central human figure is topped by a cleft fringe motif—possibly feathers. From this cleft emerges a tri-lobed element identical to the one depicted on the top of the bird mask in Oxtotitlan, Mural 1. From atop the bird mask a three-pronged element also emerges. Virginia Fields has successfully linked this three-pronged element to the jester god—the central element in the Maya royal headband and the single most important symbol of royal power during the Classic Period (A.D. 200–900).⁴² In the same article, Fields has also demonstrated that the origin of the three-pronged element is to be found in the Olmec-style symbol system and that its real-life source is maize vegetation. In many Mesoamerican cultures, maize vegetation was the central tree in a cosmic directional model in which the four corners and center were marked by trees.⁴³ Brian Stross (in this publication) has demonstrated that in the Formative Period maize played a similar role. The fact that the three-pronged maize element in the headdress of the incised human image emerges from the double merlon only serves to support the identification of this three-pronged element as the world tree; symbolically, the double merlon is one of the portals between the natural and supernatural.⁴⁴ When the legs of the standing figure are examined closely, it can be seen that they are inset with the flame eyebrow, L-shaped eyes, protruding nostril and bracket gum markings that are the identifying traits of the earth monster.

Just as with Oxtotitlan, Mural 1, the function of the incised images on the jade celt from Arroyo Pesquero is to offer a visual image of a Formative Period ruler as *axis-mundi*. In Oxtotitlan, Mural 1, this was accomplished with costume elements and a throne that were metaphors for three cosmic levels. On the Arroyo Pesquero celt, the same message is conveyed by costume elements and motifs that identify the human figure as the world tree. The three-pronged element represents the sprouting crown of the world tree, an identification that can be supported by examining another celt from Arroyo Pesquero (*figure 12b*). On this second celt, the incised image is very similar to that on the first; however, the lower body of the central figure is not depicted, and instead of holding a zoomorphic image in his arms, he appears to be holding stalks of bound vegetation. The headdress of the

**FIGURE 12**

a. and b. Two celts from the heartland site of Arroyo Pesquero. These two celts or axes are incised with images of Olmec rulers depicted as the *axis-mundi* world tree. Both the incised figures hold ceremonial bars: one serpent-like, the other bound vegetation. Both figures wear buccal masks and both wear headdresses topped by elements that can be identified as corn; both are flanked by four sprouting cleft rectangles. However, the incised celt on the right is lacking lower body parts. (After Joralemon. "The Olmec Dragon," figures 8e and f.)

figure on the second celt, like that worn by the first, consists of a three-pronged element emerging from a cleft; but in this instance the identification is more explicit. As mentioned, the legs of the first figure are inset with motifs that identify them as the down-turned head of an earth monster. The link between crocodilians and vegetation has been discussed previously. This metaphor is not uncommon in Mesoamerican art and is clearly represented on Stela 25, at the Late Formative Period (600 B.C.–A.D. 200) site of Izapa (*figure 13a*) and on a Classic Period Maya painted vessel (*figure 13b*). The placement of a down-turned, crocodilian-derived earth monster head on the lower body identifies that area as the trunk of the world tree. Certainly, the later Classic Period Maya used the tree metaphor prominently in their iconography of royal power,⁴⁵ and as early as the Late Formative Period, Maya rulers at the site of Kaminaljuyu in highland Guatemala were using costume elements to convert their images into zoomorphic representations of the world tree (*figure 14*).

The snake-like zoomorph held in the arms of the central human figure, as if it were a ceremonial bar, is a more difficult identification. If this were a Classic Maya image, it would most certainly be identified as a unique form of the double-headed serpent bar. The identification of the buccal mask is also uncertain, but if it functions in the same manner as other Formative Period masks with a surer identification, then it surrounds the human figure's mouth in order to turn it into a cave entrance or portal through which supernatural power can manifest itself into this world.

In order to locate the crossed bands on the Arroyo Pesquero celt, it must first be understood that a perspective problem faced the artist who carved and incised this celt, just as it did for the potter who created the Tlapacoya vessel (*figure 8b*). The creator of the Tlapacoya vessel solved the problem by depicting frontal and profile variants of the same image. The artist who carved the Arroyo Pesquero celt was limited by his tools, the hardness of the jade and by the thematic function of the design. But when shadowing is added to the incised images, giving them the dimensionality that the real-life image which they depict actually had, the location of the crossed bands motif, though implicit, becomes obvious running from each of the corners marked by the cleft and sporting rectangles, they cross directly under the human

FIGURE 13

The crocodilian-derived earth monster as world tree, Itzapa, Stela 25, and a figure from a Maya painted vase. The metaphor of crocodilians as world trees is a common representation in Mesoamerica and is clearly demonstrated on this Late Formative (100 B.C.–A.D. 100) monument from Itzapa and on this figure from a Late Classic Maya vase.

(Redrawn from Helmuth 1987: figure 52.)

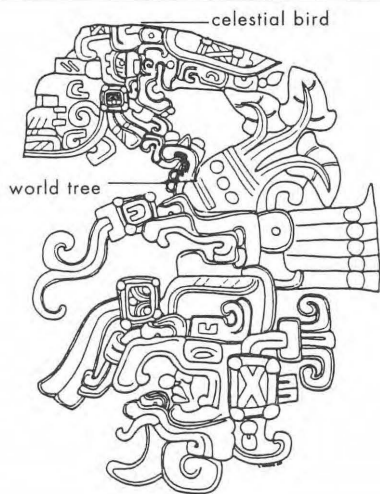
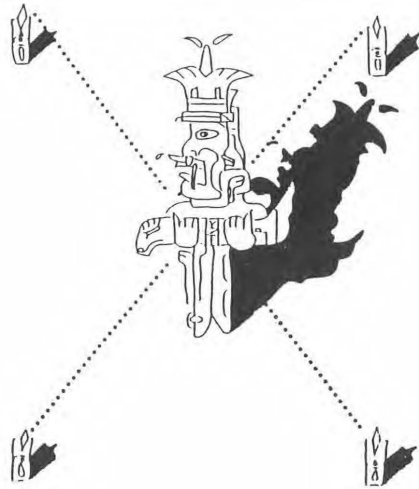


FIGURE 14

*Stela 11, Kaminaljuyu, Guatemala, detail of a ruler's head. The headdress worn by this figure is in the form of a world tree with the celestial bird in its branches. Stela 11 dates to the Late Formative Period (100 B.C.—A.D. 100.) (After Linda Schele and Mary Miller. 1986. *The Blood of Kings: Dynasty and Ritual in Maya Art*, figure 11.2, The Kimbell Art Museum, Fort Worth, Texas.)*



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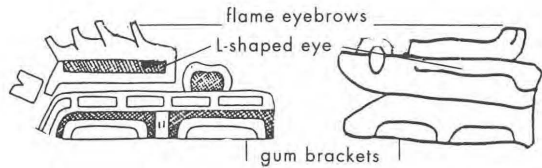


image (figure 15). Since those legs also form the mouth of the earth monster, the implicit crossed bands serve both to center the human world tree and to identify the mouth of the saurian supernatural as a portal for supernatural power. By the implicit use of the crossed bands, the human image on the Arroyo Pesquero celt is identified as the interface between the natural and the supernatural, as the cosmic balance and as the world tree.

As we have seen, the purpose of Olmec-style symbols was threefold: they provided the metaphors by which a non-literate culture could describe the actuality of a multi-leveled cosmos; they visually described the ideological charter by which Mesoamerican Formative Period rulers justified their right to rule, and they described the interface between the natural and the supernatural as the cosmic stage on which the rituals of rulership were enacted. Combining these three functions, the Olmec-style symbol system provided access for different Mesoamerican linguistic groups to a common system of communication. It also provided for those emerging elites who participated in the Formative Period ceremonial complex a supernatural-derived legitimacy of what was in fact a product of social constructs.

FIGURE 15

The Arroyo Pesquero celt enhanced. The image incised on this Arroyo Pesquero celt was a depiction of, what was in the artist's mind, a three-dimensional figure. When shadowing is added to the flat incised image, the three-dimensional image which was intended leaps out at the viewer. The implicit crossed bands which center this figure in the middle of the cosmos are indicated with crossed bands that run from the sprouting cleft rectangles (representing the four directions) at the four corners of the composition. The legs of the figure, when compared to the earth monster profile from the Tlapacoya vessel, are a representation of a down-turned earth monster head. (Adapted from Joralemon. "The Olmec Dragon," figure 8f.; and Joralemon. "A Study of Olmec Iconography," figure 120.)

1. Lyle C. Campbell and Terrence C. Kaufman. 1976. "A Linguistic Look at the Olmec." In *American Antiquity*. Vol. 41: 80-89.
2. J. Kathryn Josserand, Marcus Winter and Nicholas Hopkins. 1984. "Essays in Otomanguean Culture History." Nashville: *Vanderbilt University Publications in Archaeology*, No. 31.
3. Michael D. Coe. 1965. "The Olmec Style and Its Distributions." In *The Handbook of Middle American Indians*. Vol. 3, ed. Robert S. Wauchope, 739-775. Austin: The University of Texas Press.
4. For the purposes of this paper the term "theme" refers to an overall design or a combination of elements and motifs unified in a coherent whole. A "motif" is an element which in combination with other motifs can form a theme. An example of the use of this terminology would be the theme of the Olmec earth monster. An L-shaped eye, gumbrocket, vegetative element, flame eyebrows etc., would be some of the individual "motifs" which, when combined in a certain order, form the earth monster theme.
5. Kent V. Flannery. "The Olmec and the Valley of Oaxaca: A Model for Inter-Regional Interaction in Formative Times." In *Dumbarton Oaks Conference on the Olmec*. ed. Elizabeth P. Benson, 79-117. Washington, D.C.: Dumbarton Oaks.
6. David C. Grove. 1989. "Olmec: What's in a Name?" In *Regional Perspectives On the Olmec*. eds Robert J. Sharer and David Grove, 8-14. Cambridge: Cambridge University Press.
7. The designation "Formative Period Ceremonial Complex" was a by-product of several long discussions held by the author with David Grove and Susan Gellespie while on a visit to their home in November, 1989. During our discussions we concluded that the archaeological model that seemed most closely related to what was happening in Formative Period Mesoamerica is the Southeastern Ceremonial Complex. The Southeastern Ceremonial Complex is a label used to describe the art style, the long distance trade network and the ritual activity associated with dynamic chiefdoms flourishing in the Southeastern United States during the Mississippian Period (900-1500 A.D.).
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9. *Ibid.* 163-166.
10. Susan Milbrath. 1979. "A Study of Olmec Sculptural Chronology." In *Studies in Pre-Columbian Art and Archaeology*, No. 23. ed. Elizabeth P. Benson. Washington, D.C.: Dumbarton Oaks.
11. David C. Grove. 1973. "Olmec Altars and Myths." In *Archaeology*. Vol. 26, No. 22, 128-135.
12. In its profile variant, on Chalcatzingo, Relief 1, the quatrefoil was identified by Michael Coe ("The Olmec Style") as the gaping cave monster that frames the seated figure. David Joralemon demonstrated ("The Olmec Dragon") that the quatrefoil shaped mouth of the supernatural carved on Chalcatzingo, Monument 9 (see figure 6a, this article) is a frontal view of the cave monster depicted on Chalcatzingo, Relief 1. Recent excavations at the highland site of Teopantecuanitlan uncovered four upside-down, T-shaped stone monoliths. It is my contention that just as the cave monster on Chalcatzingo, Relief 1 was artistically created by vertical splitting a quatrefoil image similar to Chalcatzingo, Monument 9, then the upside-down, T-shaped Teopantecuanitlan monoliths were artificially created by splitting the same quatrefoil image horizontally. If the vertically split quatrefoil can become the cave monster, then the horizontally split quatrefoil can be demonstrated to be a mountain, through its striking similarity to the generic hill or place sign carved on the conquest slabs at Monte Alban. All known examples of the quatrefoil and its variants, during the early and middle Formative period, occur only in those highland areas that would have been inhabited by Otomanguean speakers. Thus, it may be that the quatrefoil motif can function as a linguistic/ethnic marker in future Formative period investigations.

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21. Abner P. Cohen. 1974. *Two-Dimensional Man: An Essay on the Anthropology of Power and Symbolism in Complex Societies*. London: Rutledge and Kegan.
22. Joralemon, "The Olmec Dragon," 37.
23. Ibid.
24. Linda Schele has never written extensively on the Olmec. The repeated references to her work are from lecture notes 1985-89.
25. Michael D. Coe. 1972. "Olmec Jaguars and Olmec Kings." In *The Cult of the Feline: A Conference on Pre-Columbian Iconography*, 1-18, ed. Elizabeth Benson. Washington, D.C.: Dumbarton Oaks. Peter T. Furst. 1968 "The Olmec Were-Jaguar Motif in the Light of Ethnographic Reality," 143-178. ed. Elizabeth Benson, in *Dumbarton Oaks Conference on the Olmec*. Washington, D.C.: Dumbarton Oaks.
26. David C. Grove. 1984. *Chalcatzingo: Excavations On the Olmec Frontier*. London: Thames and Hudson Ltd..
27. Coe, "Olmec Jaguars"; Furst, "The Olmec Were-Jaguar"; Reilly, "Enclosed Ritual Spaces and the Watery Underworld in Formative Period Architecture: New Observations on the Function of La Venta Complex A." 1991. In *Seventh Palenque Round Table*. eds. Merle G. Robertson and Virginia Fields. San Francisco: The Pre-Columbian Art Research Institute (in press).
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34. Joralemon, "The Olmec Dragon," 37-40.
35. David C. Grove. 1970. "The Olmec Paintings of Oxtotitlan Cave, Guerrero, Mexico." In *Studies in Pre-Columbian Art and Archaeology*, No. 6.

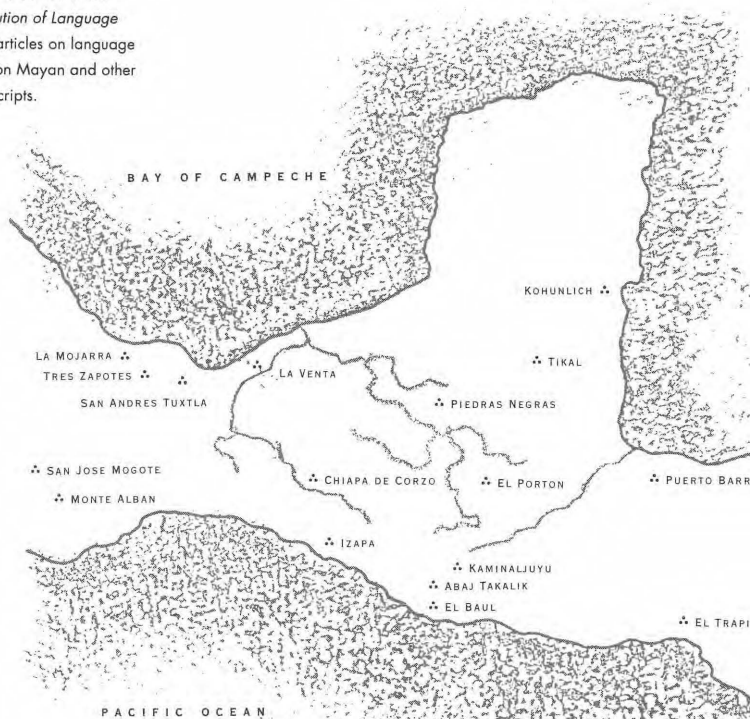
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36. Carlo T. E. Gay. 1967. "The Oldest Paintings of the New World." In *Natural History*, Vol. 65, No. 4, 28-35.
37. William R. Fash. 1987. "The Altar and Associated Features." In *Ancient Chalcatzingo*, ed. David C. Grove, 82-94. Austin: The University of Texas Press.
38. One of the puzzling features of the Chalcatzingo altar is that it is incised with eyes but lacks a mouth (see figure 11b in this article). As I have discussed, the entrance to the supernatural under or other world was artistically depicted, and certainly perceived of, as the gaping mouth of a zoomorphic. In ancient Mesoamerica, natural features such as the cleft between mountains and caves were perceived as this supernatural mouth or portal. But such a portal could also be artificially constructed as well (Reilly. "Enclosed Ritual Spaces and the Watery Underworld"). Such artificial portals took the form of sunken courts or patios. Such is the case with the throne and sunken patio at Chalcatzingo where the mouth of the throne zoomorph is not depicted but should be understood to be the sunken patio itself.
39. Grove, "The Olmec Paintings," 31.
40. *Ibid.*, 9.
41. The ritual importance of the artistic renderings of Olmec-style flying figures is only beginning to be understood (Reilly. "The Shaman in Transformation Pose," 16-17). The evidence for defining these figures as flyers is a category of carved, horizontal figures dressed in ceremonial costumes. The most explicit of these flying figures is Chalcatzingo, Monument 12, which is carved on a bolder monument. On Monument 12, the horizontal human figure is flanked above and below by flying birds—an artistic device to identify the medium through which the horizontal figure moves as air. I believe that the Olmec-style flying figures are illustrations of one of the most important principles of Formative period rulership charter—the ability of the ruler to cross the portal between the natural and supernatural realms and thus gain the sanctification that legitimized his right to rule. It may very well be that the bird costume worn by the seated figure in Oxtatitlan, Mural 1 is an accurate rendering of the vestments that the local ruler would wear when enacting these rituals of sanctification and legitimization.
42. Virginia Fields. 1991. "The Iconographic Heritage of the Maya Jester God." In *Sixth Palenque Round Table*, eds. Merle G. Robertson and Virginia Fields, 167-174. Norman: the University of Oklahoma Press.
43. During the long cultural history of Mesoamerica, different cultures used different combinations of plant species to illustrate the five cardinal directions. In the Borgia codex (attributed to the Post-Classic Mixtec culture), the central world tree or axis-mundi is a corn plant (page 53) each of the four other directional trees is a different species. However, for the Classic period Maya, the world tree was a ceiba.
44. Reilly, "Olmec Iconographic Influences," 157-158.
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This paper is dedicated to Leroy Cleal.

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**FIGURE 1**

Map of Mesoamerica showing localities of Late Formative Mesoamerican scripts. Four scripts are found here: Oaxacan, as at Monte Alban; Izapan, as at Kaminaljuju; Isthmian, as at La Mojarra; and Mayan, as at Tikal. (After Marcus. "The Origins of Mesoamerican Writing," 42.)

Brian Stross

INTRODUCTION

The Formative Period (1500 B.C.–A.D. 200) witnessed the beginnings of writing in Mesoamerica,¹ and by the end of the Late Formative, (300 B.C.–A.D. 200), writing was represented by at least four related scripts.² What remains of these scripts for us to see is inscribed on large stone monuments, and more rarely, scratched out on small portable carved stone figures. The first and westernmost has been called Oaxacan, and focuses on the Oaxaca Valley in the Monte Alban sphere of influence (*figure 1*). A second script, referred to as Izapan, includes examples from the Socusco region, such as Abaj Takalik, as well as from the highland Guatemalan site of Kaminaljuyu. A third script, called Isthmian, occurs in the Isthmus of Tehuantepec area, encompassing Chiapa de Corzo to the east and represented by a spectacular stela from La Mojarra to the northwest. The Maya lowlands reference a fourth script found in Late Formative times, one that can be called Mayan and is exemplified by the Hauberg Stela, the provenance of which is unknown but likely to be somewhere in the environs of the lowland Guatemalan site of Tikal or northeast of it near Kohunlich.³

OVERVIEW

These four scripts are easily distinguishable both in formal terms and by provenance, but they share significant elements to such a degree that they cannot have developed in isolation from one another; they must have a common ancestor. The shared elements include calendrical information based on essentially the same calendars of 260 and of 365 days; bar-and-dot numerical notation; single-column format, becoming doubled in the Maya region; profile heads facing left when columns are read from left to right (the usual direction); and even specific glyph forms, e.g., quincunx, cross, jaguar, sky bands, earth panel, seated profile figure, comb shape, human digit, human hand, various

ABSTRACT

A general overview of the form and substance of Late Formative writing in Mesoamerica is undertaken here. Recent significant additions to the corpus of Mesoamerican Late Formative script have contributed new information warranting a review of our knowledge of this pivotal time period. Focusing on two of these additions for more detailed observations, analysis of the iconographic context of the script reveals considerable interdependence between text and context and provides a glimpse of the importance of cosmological considerations in the display of power. Maize and stages of maize growth are shown to be of crucial importance to power display as well as to the system of divinatory day names integral to the 260-day ritual cycle. Isthmian script is seen as likely to represent a Mixe-Zoquean language, and a maize-bearing shark is identified on a recently discovered Late Formative stela from Veracruz.

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profile human heads, frontal face, moon-like crescent, pitcher, mountain, tripartite maize element, trident introductory sign, circled dot and several others.

Oaxaca script (*figure 2*): like the others, this Late Formative script descends from a Middle Formative prototype. The language of the script is unknown, but the fact that bar and dot numerals are postposed to day names instead of preposed suggests a Zapotecan language. The glyphic passages are short (up to half a dozen glyphs) and highly depictive; signs reference dates, place names and a few verbal “event” glyphs.⁴

Izapan script, on Kaminaljuyu Stela 10 (*figure 3*): this example cannot be dated securely, nor can the language of its script be specified, although Justeson proposes that the language might be Mixean.⁵ The large bar-and-dot number “8” associated with an animal head and a large trident shape on this stela might be interpreted as an introductory glyph and a *haab* (365-day year) date or as an introductory glyph and a cycle-8 glyph (representing a count of eight completed cycles of four hundred years each having elapsed since 3114 B.C., when the era began). Several of the glyphs on this stela resemble Maya glyphs while others are more like the Isthmian. The fact that four columns are represented makes it difficult to determine whether the format is single or double column. The placement of numerical bars within the text, however, suggests a single-column format.

Late Formative Isthmian script, on a recently discovered stela from the site of La Mojarra in Southern Veracruz (*figure 4*): the text has more than 400 glyphs in all, more than 150 of them different,⁶ and when day names and month names are considered, this implies a script with no fewer than 200 glyphs. These glyphs have fewer affixes than do the later Classic Maya glyphs, suggesting primarily logographic signs with less elaboration of phonetic complementation than is found later in Classic Maya writing. While the language of the Isthmian script remains uncertain, language distribution evidence suggests that it may be Zoquean,⁷ and a study of iconographic homophony appears to favor Mixean.⁸

This stela has two dates in the upper center that, when referenced to the Maya long count and converted to the Gregorian calendar, according to the 584285 correlation formula, yield May 21, A.D. 143 and July 13, A.D. 156.⁹ Time periods elapsed since the era beginning are marked by numbers in a type of place notation, but the periods themselves are not overtly represented. The trident-shaped introductory glyph precedes both long counts, and unlike the Classic Maya format, the *haab* (365-day solar year) date here precedes the *tzolkin* (260-day ritual cycle) date. On the right side of the stela, the

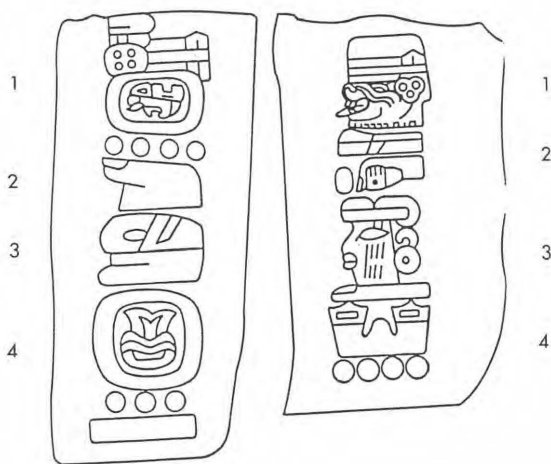


FIGURE 2

Oaxaca script from Stelae 12-13, Monte Alban, Valley of Oaxaca, Mexico. Single-column script here shows bar-and-dot numbers postposed to day names as they would be in a Zapotecan language. Signs reference dates, place names and a few verbal "event" glyphs.

(After Marcus. "The Origins of Mesoamerican Writing," 46.)

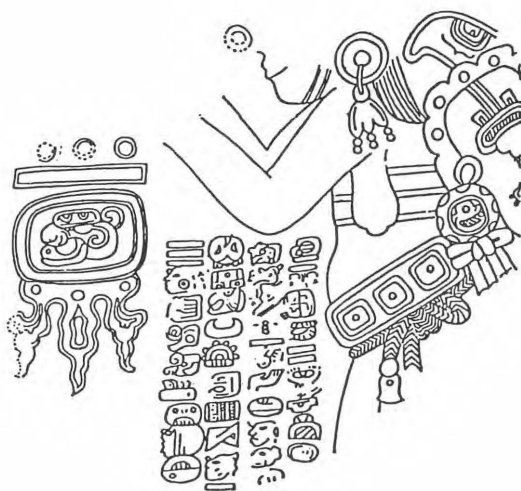


FIGURE 3

Izapan script from Kaminaljuyu Stela 10, Guatemala. This may represent a Cycle 8 date, specifying events relating to that date. Glyphs resembling both Mayan and Isthmian signs are nonetheless not quite identifiable. The placement of bar-and-dot numbers suggests a single-column format, and the image accompanying the glyphic text may represent a ruler.

(After Ayala. "El Origen de la Escritura," 219.)

glyph columns are to be read from left to right, whereas on the left it is precisely the opposite. Of great interest is the fact that the standing figure, which occupies the left half of the stela, has both glyphic and iconographic elements, illustrating that the figure has been reversed, as if one could open out the left side of the stela like the page of a book. This, as much as anything else, suggests that writing was also by this time put on perishable materials such as the deerskin and fig-bark paper later used by Mesoamericans.

The Hauberg Stela (*figure 5*): more likely than the other three scripts of the Late Formative to reflect a Mayan language, this stela is tentatively dated A.D. 199.¹⁰ Here, the trident-shaped introductory glyph even more closely resembles sprouting maize, and it contains the month patron infix. This is not followed by a long count, as in the Isthmian example, but rather by the month (*haab* date) and information on the presiding Night Lord as well as the lunar cycle. Exactly the opposite of Classic Maya practice, the month (*haab* date, 13 Xul) here precedes the day name (*tzolkin* date, 3 Ahau).

Several of the glyphs on this stela have clear counterparts in Classic Maya script, and at least one attempt has been made to interpret the text, with partial success. Schele concludes that following the date, this Hauberg text records a bloodletting ritual that occurred fifty-two days before an office-taking rite.¹¹ A single-column text on the left side adopts a two-column format at the bottom of the stela.

DISCUSSION

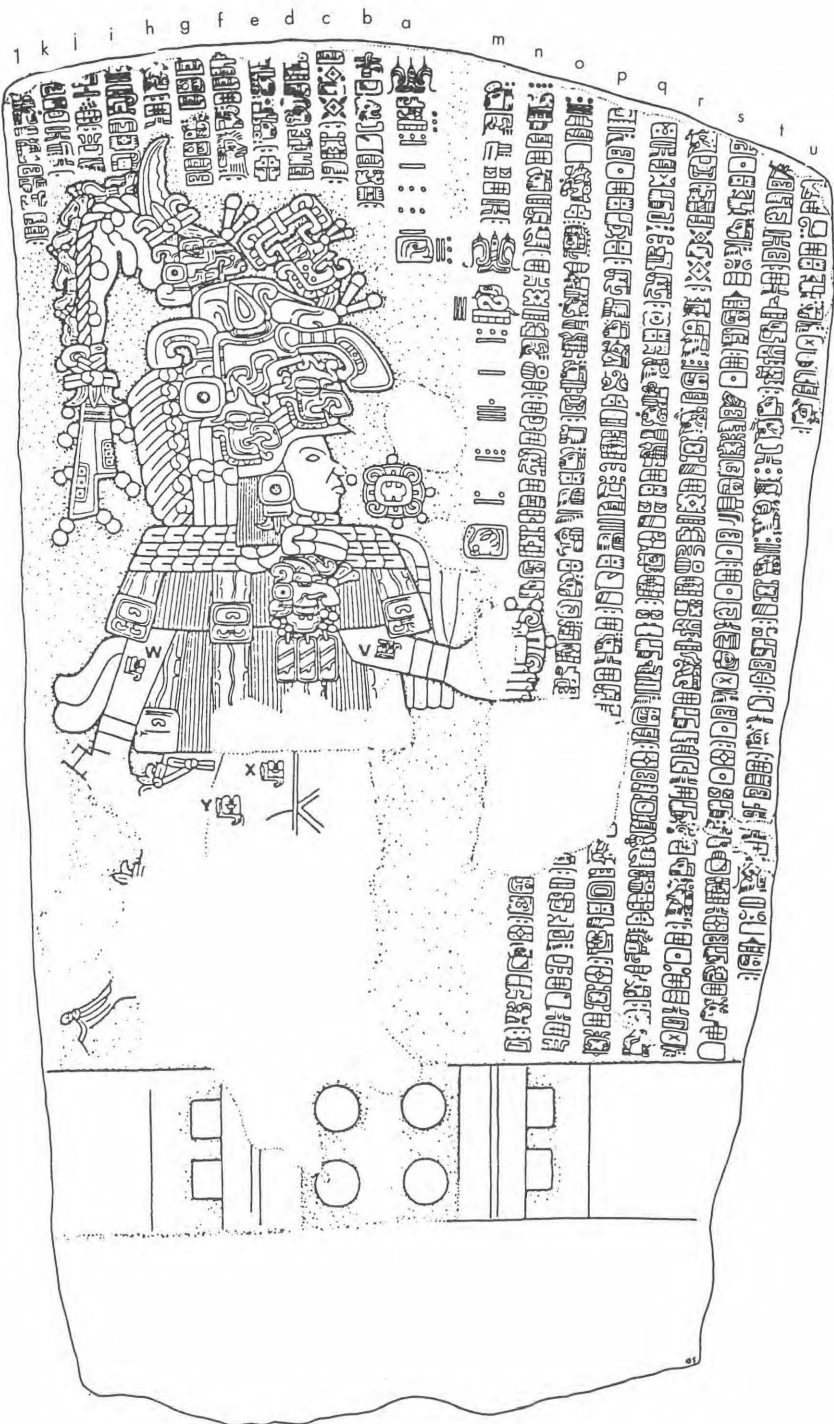
Although none of the four Late Formative scripts has yet been successfully deciphered apart from the dates, linguistic studies in Mesoamerica provide some insights concerning their interpretation, just as such studies have aided recent, much more successful efforts towards the continuing decipherment and understanding of the Maya script. In addition to having some ideas about which languages are represented by the scripts, we also know some things, and suspect others, about form and content of the scripts and attendant iconography.

Among other things, we can reflect on the general content of what remains to us of Late Formative script samples in iconographic contexts. It is cosmological information, presented, we infer, as a means of illustrating and justifying the power base of the ruler,¹² employing and augmenting a symbol system native to Mesoamerica that goes back to Early Formative times

FIGURE 4

Isthmian script from La Mojarra Stela 1. More than four hundred glyphs are shown, and two dates occur in the central column. Both text and image of left and right sides of the stela are mirror images of one another, as if the left side could open out like the page of a book. The ruler depicts himself here as the center of the cosmos.

(After Winfield Capitaine. "La Estela 1 de La Mojarra," 7, drawing by George Stuart.)



and forward in time to the Classic Maya and beyond.¹³

We can also infer, assisted by our understanding of the Classic Maya script, some of the different discourse genres represented in Late Formative script. Among others, we should expect to encounter examples of: (1) invocation of patron deities and their powers;¹⁴ (2) narrative political history, such as is implied for the La Mojarra Stela 1;¹⁵ (3) commemoration of temporal events, such as the completion of time cycles,¹⁶ the conjunction of planets,¹⁷ important positions in the Venus cycle (such as elongations, heliacal risings, etc.), and so on, although such commemoration may well function also in the context of narrative political history; (4) formulaic (re)creation of the world through script for animating human constructions, with the assistance of caching and sacrificial offerings, and (5) name tagging, a term that refers to the documented Classic Maya practice of attaching a possessive prefix to an object's name (e.g. an earflare) on the object itself, followed by other identifiers such as the names and titles of an individual presumed to be the owner.¹⁸

ORIGINS

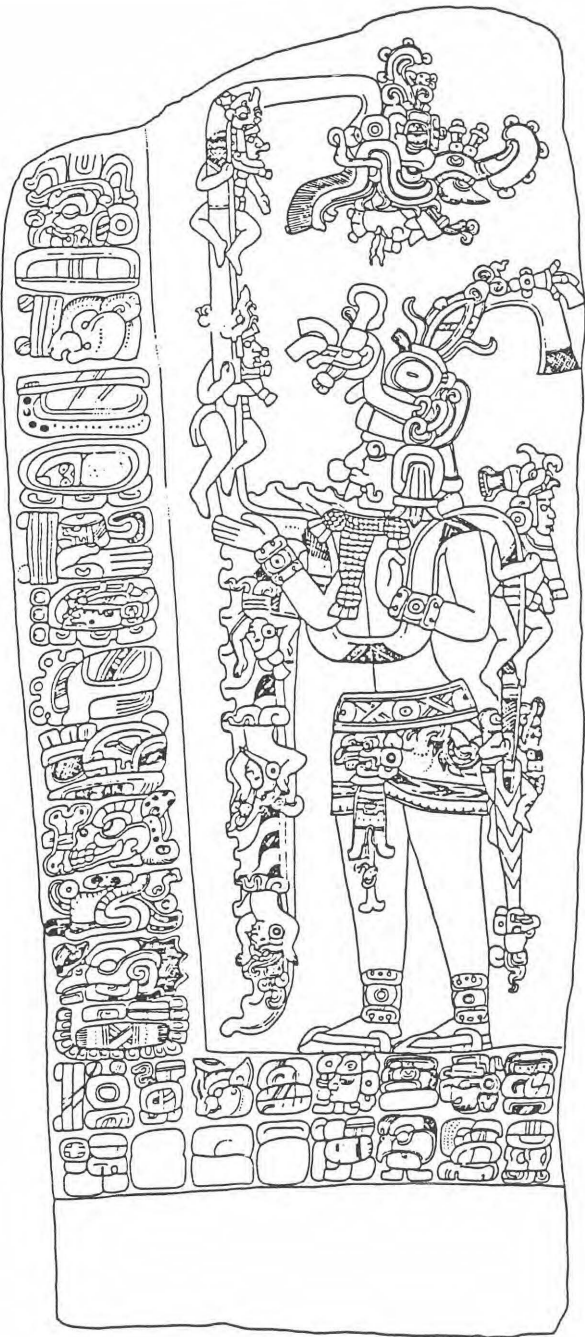
Justeson has compellingly argued the importance of numeration in the origin of Mesoamerican writing, maintaining that elements from distinct graphic systems are brought together in a meaningful way that results in emergent writing "via juxtaposition of numerals with icons or depictions. This is inconsistent with the interpretive principles of art, where number is depicted by replication, while identification of enumerated items is foreign to a tally system. Language structure does correspond to such juxtaposition, in that numerals and the enumerated are represented by distinct roots or words."¹⁹ He suggests that the association of numerals with independent non-numerical visual symbols occurred in Mesoamerica by way of the names of the 260 days of the ritual calendar.²⁰ He has identified here an essential mechanism in the origin of writing, activated during the Middle Formative in Mesoamerica.

But we need to consider also the continuing process of systemic change, including refinement, that occurred in both the developing script and in the iconographic symbol system which accompanied it and that both influenced and was influenced by it.

Focusing first on the massive Isthmian Stela 1 from La Mojarra (*figure 4*) and then on the miniature Mayan Hauberg Stela (*figure 5*), one can see quite clearly the close relationship between the writing and iconography in Late Formative times. Both script and

FIGURE 5

Maya script from the Hauberg Stela. The single-column text referring to a bloodletting ritual gives way to double-column format at the bottom. The ruler depicted is at the center of a cosmos in which maize figures prominently. Maize sprites representing stages in the maize life cycle descend from a sky-serpent/digging stick and culminate in the ear of maize on the ruler's headdress. (After Schele. "The Hauberg Stela.")



pictorial context amplify for each other the intertwined themes of maize and human cyclicity, of transformation and power.²¹ Underlying the development of writing in Mesoamerica is an enduring effort to control or influence nature as well as humans by ritually recreating the world, its parts and processes, in miniature by the production of icons metaphorically referencing its parts and spatially relating them to one another in what may be called cosmograms. Simply put, writing emerged in Mesoamerica not as a by-product of economic activities but rather as a result of attempts to control nature and to obtain, legitimize and maintain power by means of reproducing the world, first in cosmograms and then later in more specific written form.

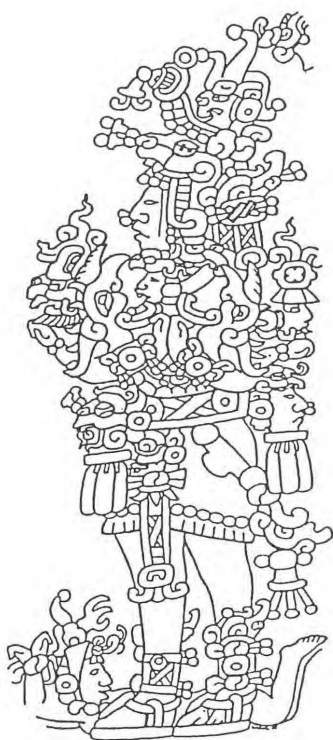
These motives are clearly shown and relatively well understood in the case of the very Early Classic Maya Leiden Plaque, a jade pendant from the Tikal region, with text on one side and picture on the other (*figure 6*). The text shows the two-column Maya format, following the single-column long count and day glyph (*tzolkin* date), and includes the long count period glyphs. Here, the day name precedes the month name in typical Classic Maya fashion. The Leiden Plaque records the accession of a ruler on September 17, A.D. 320, almost certainly in a Mayan language, probably Cholan Mayan. The ruler is depicted on the other face of the plaque, standing in regal pose and in full regalia. Text and image complement each other in communicating essentially the same message: asserting the ruler's authority, power and right to rule.

LA MOJARRA STELA 1 AND THE HAUBERG STELA

One hundred and seventy years earlier than the Leiden Plaque, found in the Mixe-Zoquean rather than the Maya region and employing a different script, La Mojarra Stela 1 depicts a standing ruler, displaying his power and authority by means of a cosmologically significant costume in which he is the center of the universe and, by means of the "portal/mouth," representing access to the other world that is held in his hand and floating in front of his own mouth (*figure 4*). It is likely that the accompanying text refers to this ruler's accession to power and possibly also to his heir apparenty ritual as well as to his descent through specific individuals, validating his right to rule.

FIGURE 6

Leiden Plaque, obverse and reverse. The two-column glyphic format of Early Classic is represented here. The ruler, with the same belt as on Hauberg, is posed in the same "crab-claw" position but stands on a captive and holds a double-headed serpent bar from the mouths of which emerge sprites with headdresses identifiable as maize growth stages. (After Schele. *Notebook for the XIIIth Maya Hieroglyphic Workshop*, 44.)



5th Lord of
the Night
Yaxkin
Name
Chan



ISIG
with the patron
of Yaxkin

8 baktuns

14 katuns

3 tuns

1 uinal

12 kins

1 Eb

chum "seating"

he was seated

Balan-Ahau

title

The relation between iconography and text is illustrated also by the birdlike head at O5, which resembles the bird-mask headdress of the ruler depicted on the stela (*figure 7a*); by the probable glyphic depictions of the ruler himself in columns A, O and Q (*figure 7b*), recognizable from his circular nose ornament; and by the glyph at Q38 that is replicated in reverse on the arms and costume of the ruler depicted (*figure 8a*).

Another approach to understanding the script on La Mojarra Stela 1 is by tracing the form of a glyph both backwards and forwards in time. For example, a glyph at position S15 (*figure 8b*) can be traced forward in time to the Classic Maya "sun at horizon" glyph collocation, consisting of a sky glyph above and an earth glyph below, opening like jaws with a sun glyph between them.²² This collocation is exemplified in *figure 8c*, the earth portion of which is very like the terrestrial panel of the roughly contemporaneous Kaminaljuyu Stela 11 (*figure 9a*) and the half-millennium-earlier rendition of a terrestrial panel on the bottom of the Middle Formative cosmogram of *figure 9b*. The Middle Formative terrestrial panel has, in fact, two recognizable descendants a thousand years later in Classic Maya script: the *caban* (earth) glyph of *figure 10a* and the *na* glyph that so frequently subfixes the sky glyph²³ and that has a widely recognized phonetic value of *na*, seen here in an early variant from Tikal (*figure 10b*). This phonetic value is so

48

FIGURE 7

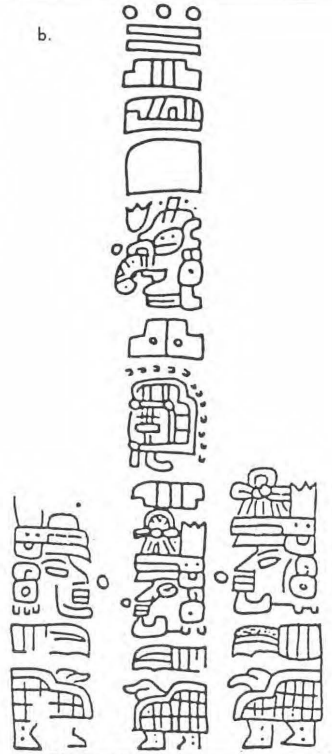
a. Glyph at O5 on La Mojarra Stela 1. The long-lipped "birdlike" glyph with a trident forehead ornament resembles the image of a ruler's long-lipped "birdlike" mask (cf. *figure 4*).
(After Winfield Capitaine. "La Estela 1 de La Mojarra," 18.)

a.

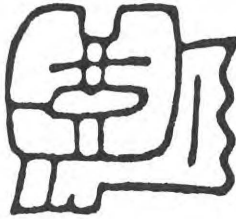


b. Glyphs depicting ruler, columns A, O and Q on La Mojarra Stela 1. Glyphs of a ruler represent the same ruler depicted in the image (cf. *figure 4*).
(After Winfield Capitaine. "La Estela 1 de La Mojarra," 18.)

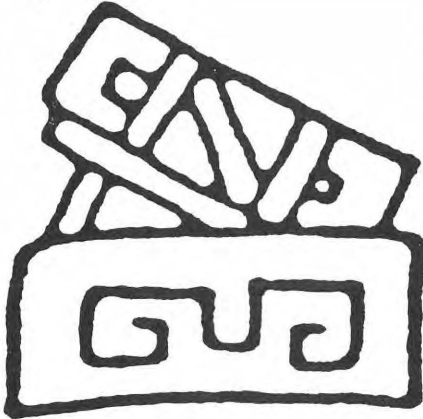
b.



a.



b.



c.



FIGURE 8

a. *Glyph at Q38 on La Mojarra Stela 1.* The glyph from this column is the same as that depicted on the ruler's costume (cf. figure 4). (After Winfield Capitaine. "La Estela 1 de La Mojarra," 19.)

b. *Glyph at S15 on La Mojarra Stela 1.* The glyphic representation of sky being separated from earth by a near-vertical bar resembles the later Mayan glyphic depiction of "dawn" shown in figure 8c. (After Winfield Capitaine. "La Estela 1 de La Mojarra," 18.)

c. *Sun at horizon glyph collocation, with sky, earth, and sun glyphs labeled—from Chichen Itza, Temple of Four Lintels, Lintel 2a (A-1).* This glyph is a later modification of the precursor shown in figure 8b. (After Krochock. "The Hieroglyphic Inscriptions and Iconography of Temple of the Four Lintels," 234.)

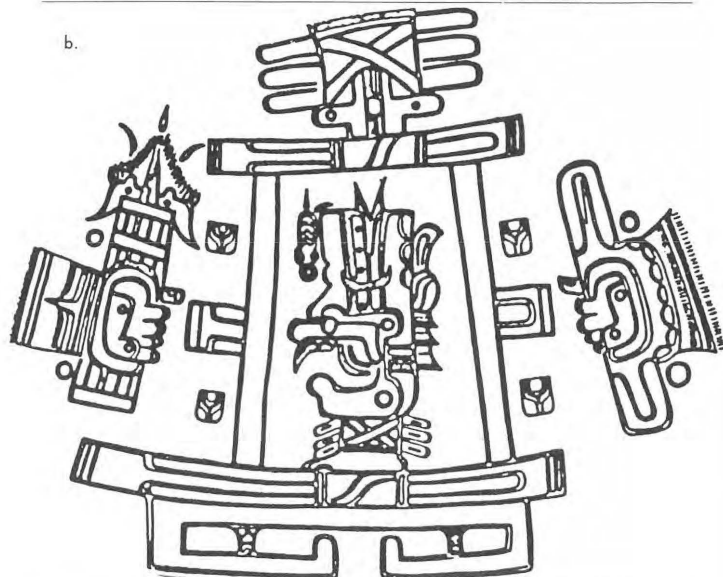
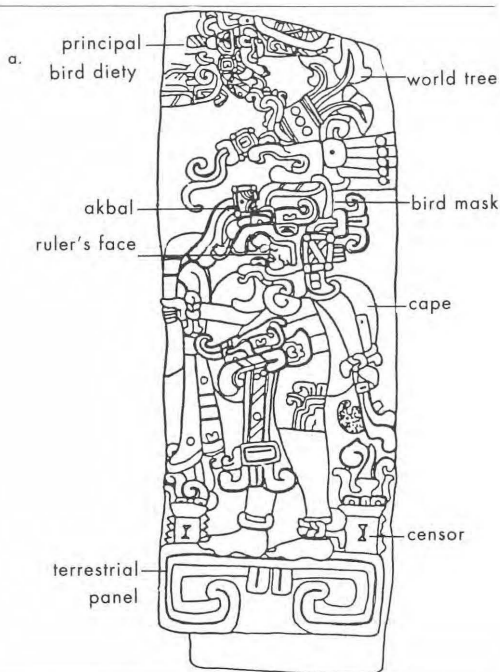
close to the Mixe and Zoque words for “earth,” *nax* and *nas* respectively, that one is tempted to see the Maya phonetic value as derived from a Mixe-Zoquean language. Thus, not only is the “earth” part of the glyph collocation at S15 on La Mojarra Stela 1—also to be found separately on this stela—likely to have a value of *nax* or *nas*, Mixe-Zoquean words for “earth,” but when combined with the evidence of language distribution and of iconographic homophony, this inference lends credence to the conclusion that Isthmian script represents a Mixe-Zoquean language.

FIGURE 9

a. Kaminaljuyu Stela 11.

The ruler stands on a “terrestrial panel” symbol of earth that is equivalent to the earth signs constituting the bottom halves of the glyphs shown in figures 8b and 8c. (After Cortez. “The Principal Bird Deity,” 190.)

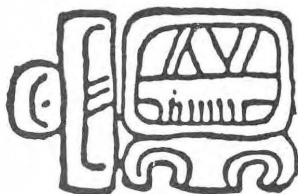
b. Chalcatzingo Urn. This Middle Formative period image shows a terrestrial symbol on which rests a disembodied head. It is semantically equivalent and visually similar to the terrestrial panel of figure 9a.



a.



b.



51

FIGURE 10

a. Maya "sun at horizon" glyph. Note that the terrestrial panel of figure 9b is the progenitor of the Classic Maya *caban* (earth) glyph shown here, constituting the bottom half of this "sun at horizon" glyph.

(After Thompson. *Maya Hieroglyphic Writing*, figure 31, no. 42.)

b. Two variants of Early Classic "sky" with "na" suffix, from Tikal. Note that the Classic Maya *na* glyph subfixing these examples of "sky" descend from the Middle Formative terrestrial panel of figure 9b and are cousins of the *caban* (earth) glyph shown in figure 10a.

(After Schele. *Notebook for the XIth Maya Hieroglyphic Workshop*, 71.)

The evidence of iconographic homophony can be summarized simply if we examine the rear part of the ruler's headdress on La Mojarra Stela 1 (*figure 4*). It is a shark—oddly depicted, to be sure, but unequivocally a shark—with four baby sharks swimming up the notochord. It is a shark whose bifurcated tail doubles as a twin ear of maize (*figures 11a and b*) and whose fin doubles as a serrated-edge knife like those used to extract hearts in Teotihuacan murals (*figure 12*). The shark/maize

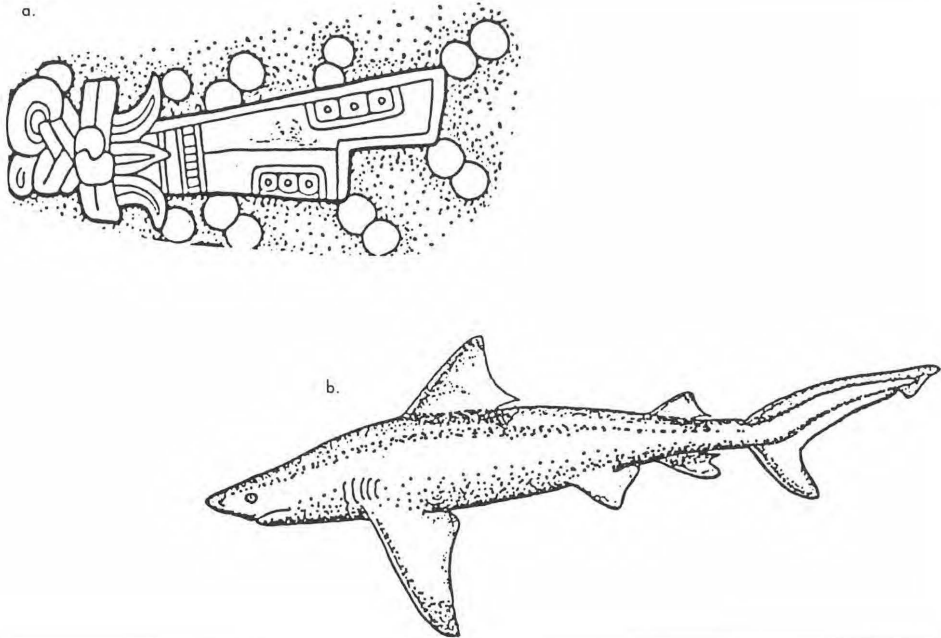


FIGURE 11

a. Maize ear/shark tail, from La Mojarra Stela 1. This depiction of an ear of maize comes from the tail of the shark identified in the ruler's headdress depicted on the stela shown in *figure 4*.

b. Shark tail. The maize ear/shark tail of *figure 11a* can be compared to the tail of a bull shark.

(Drawing by Tom Jones.)

a.



FIGURE 12

a. Shark fin on La Mojarra Stela 1. The "fin" sprouting from the shoulder of the shark shown in figure 4 is backwards and is also comparable to the wavy-edged knife blade shown in figure 10b.

b. Knife blade on ceramic from Teotihuacan. This is a sacrificial knife, depicted with a stylized heart dripping blood at its tip.

b.



and fin/knife blade equations constitute very tentative evidence that the language of the La Mojarra Stela is Mixean because symbolism inherent in the iconography on this monument suggests, through visual punning, verbal analogues allowable in a Mixean language. Of major interest is the fact that non-Mayan Mixe-Zoquean languages support by near-homophony a symbolic equivalence between fish and maize. For example, Mixean *mook* (maize) sounds much like *maak* (to fish). In Oluta Popoluca (Mixean), *akxi* is “maize grains” and *akxa* is “fish species.” Less persuasive, perhaps, is the sound similarity between Mixe *kEE?pxUn* (knife blade) and *kEEkUn* ([fish] fin). La Mojarra, it may be noted, is located on the gulf coast, where tender young shark *cazon* is considered a real delicacy today, as is fresh corn; but there is still more evidence of Mesoamerican symbolic equivalence of fish and maize. For example, the shark on the ruler’s head is very like that found atop the head of another Late Formative ruler (of unknown provenience) that has even clearer vegetation iconography on the tail-end (figure 13). In both cases, the world tree is being represented in the ruler’s headdress.

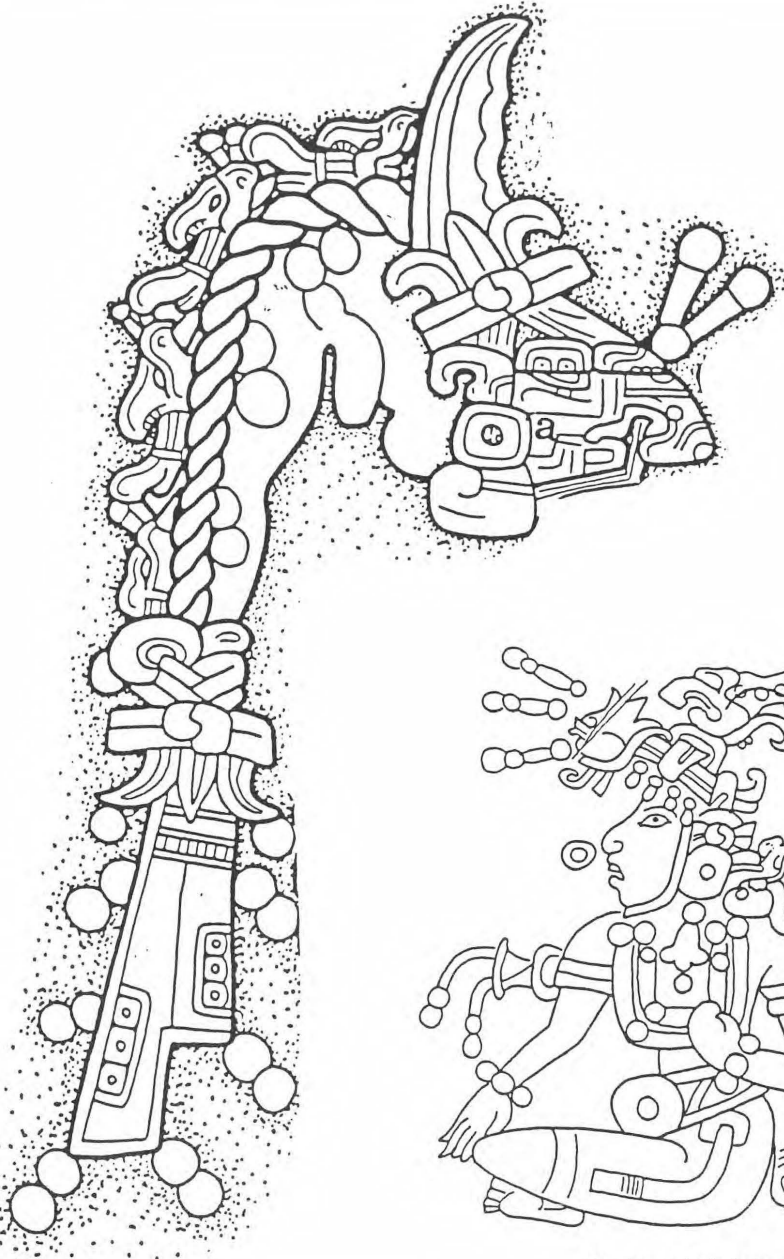
The La Mojarra shark, it will be recalled, has four baby sharks swimming up, or falling down, its rope-like notochord. These four babies and the larger mother constitute a sort of quincunx—not spatially, but in terms of four smaller and one larger. The quincunx is atop the ruler’s head at La Mojarra, identifying him, one assumes, as the central point in the universe, with the four directions around him.

Mesoamericans also see a special relationship between a quincunx pattern and maize. The Tzeltal Mayans, a typical example, relate the planting of maize to the quincunx. For them, the normal method of planting corn is to make four holes radiating out in four directions from a central hole, measured with the five-foot length of the planting stick, precisely forming a quincunx.²⁴ And it is clear that a quincunx cosmogram has persisted until today since at least Late Formative times, when cached diadem deity heads representing stages of maize growth were being set in place in a quincunx pattern.²⁵

The Hauberg Stela also contains a quincunx (figure 5). Instead of sharks with maize tails, as at La Mojarra, four sprites with maize headdresses are climbing (probably down) along the body of a “vision” serpent held scepter-like in the arms of the ruler, who has a serrated-edged, recurved knife springing from his shoulders and a shark’s tooth in his mouth. Atop his head is the fifth maize headdress, the fully mature ear of maize.

FIGURE 13

Dumbarton Oaks jade rear and shark from La Mojarra Stela 1. The fishlike monster, with vegetation for a tail, atop the ruler’s headdress can be compared in form and iconographic context with the shark from La Mojarra. (Jade after Schele and Miller, *The Blood of Kings*.)



Dumbarton Oaks Jade, rear

The other four maize headdresses on the sprites (*figure 14*) clearly represent, from left to right, the maize seed, then the sprouted seed, then the flowering ear, then the young edible maize ear (called a *jilote*) that is plucked prematurely from the stalk for eating so that its brother on the same stalk will grow all the larger. This plucking, symbolized by decapitation, is clearly indicated by the skull form of the fourth sprite and by the axe in his hand.

Whereas the Hauberg Stela's iconography makes use of a maize ear in the ruler's headdress and a maize stalk (serpent) in his hands as a representation of his power, La Mojarra Stela 1 uses two maize ears on a maize stalk (shark) in the ruler's headdress and a weapon—perhaps figuratively both a serpent and a maize stalk—to symbolize his power. Maize is clearly a power symbol. Fields, in a cogent discussion of maize and power, cites the suggestion that most politically significant symbols are overtly non-political, as maize would be, and that these are the most efficacious symbols because their potency derives from their ambiguity.²⁶

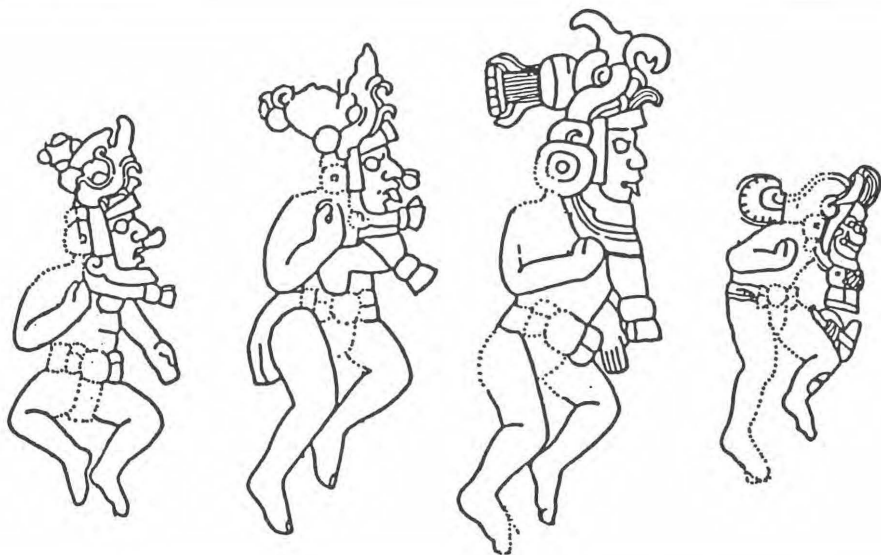
This helps to explain the Late Formative maize symbolism with which the ruler is costumed. Mesoamerican archaeological and iconographic evidence suggests that the ruler practiced cranial deformation, elongating his skull, I would guess, to more closely approximate the beautiful *elote*, the young maize ear—tender, delicious, the stuff of which humans were originally made. To be like the maize ear, he wore his hair as if it were cornsilk. His headdress reflected maize (and blood) innumerable ways and in various stages of growth. The ruler as the young maize ear, then, symbolically nourished his subjects, showing both how powerful and how nurturing he was. By his letting of blood, so closely related to maize in the cosmological scheme of things, he called forth the deities, gave birth to them, communicated with them and became their incarnate state of grace, available for ensuring a good maize harvest for his subjects. And with a shark avatar, the La Mojarra ruler was protector of his people, a terror to his enemies. He was a symbol of swift and deadly destruction. Through it all—from nurturing, through sacrificial blood, to the incarnate warrior—runs the thread of the powerful maize symbol.

Divination can be connected with this power of maize as well, not only in the use of maize kernels for divination but also in that thirteen of the twenty divinatory day names of the Maya reflect, and perhaps even derive from, stages in the life cycle of maize.²⁷ Since, in the Mesoamerican worldview, humans stem from maize, it is only appropriate that the Maya ruler should reflect on his person the various stages of the life cycle of

FIGURE 14

The maize sprites on the Hauberg Stela. Head-dresses of these maize sprites represent, from left to right, maize seed, sprouting maize seed, flowering maize (flor de milpa) and the edible immature maize ear (jilote).

(From Schele, "The Hauberg Stela.")



maize.

Returning to the beginning, the shared calendrical information in Late Formative scripts indicates an ancestral calendar system. Its relationship to writing is underscored by Justeson's conclusion that "if linguistic processing enters visual symbol systems by associating numerals with independent visual symbols, in Mesoamerica it did so via the names of the 260 days of the ritual calendar."²⁸

Each of the twenty Maya day names that are part of the 260-day ritual calendar recurs at twenty-day intervals. To pass through thirteen of the day names requires, then, 260 days, the length of the ritual calendar. There is a correspondence here with the fact that even to this day Tzeltal Mayans name thirteen stages in the life cycle of maize, many of them occurring in twenty-day increments, reflecting, it is likely, an earlier 260-day ritual and divinatory mnemonic for the life cycle of maize. The 260-day *tzolkin*, or Maya ritual calendar, not only approximates the length of human gestation, as some have suggested when discussing its origin; it also accounts "month" by twenty-day "month" for named stages of maize development, from planting to harvest of the dried ears.

The Maya ritual calendar of 260 days both reflects an ancestral one shared by all the Mesoamericans and is understood better than the ancestral one; thus, it is convenient to use it as illustration of the thesis that the first thirteen of its days are relatable to stages in the life cycle of maize. Thompson noticed that

“a sequence of thirteen of the Maya day names running from *Caban* to *Muluc* represent in the same order the identical series of gods ruling the numbers 1-13,”²⁹ so we shall begin with the day *Caban*.

Caban—ruled by the moon goddess of fertility, whose name *na* means “first”—refers to the earth, *kab*. Preparation of the earth is the first stage in the life cycle of maize.

The next day, *Etz'nab*, refers to a “spear,”³⁰ and the planting stick (metaphorically a spear) spears the ground, making holes for planting the maize during the next stage.

Cauac, the day of rain, surely refers to the rain coming and watering the planted maize crop.

The fourth day, *Ahaw*, names the sun deity, implying the sun as a crucial ingredient here, coming up towards the summer solstice and warming the earth so the watered maize can germinate.

Imix depicts the leaf of a water lily, and the corresponding Mixe day means “root.” The germinated maize kernel now has roots and/or the first leaf.

The sixth day, *Ik* (*ik* meaning “breath, life, spirit”), must be the point where life is breathed into the developing maize.

Suffice it to say that the rest of the thirteen day names, in order, can be related to stages in the life cycle of maize,³¹ so clearly in the succession of *veintena* day names there is some semantic reflection of twenty day-named stages through which the maize cycle passes. Thus, thirteen of the day names must have served as a shorthand mnemonic for stages in the maize cycle and may have been involved in the origins of the ritual calendar—and are, therefore, related to the origins of writing in Mesoamerica.

CONCLUSION

By Late Formative times, at least four different scripts had evolved in Mesoamerica, occurring up to five hundred miles on either side of the Isthmus of Tehuantepec. The earliest to develop was east of the Isthmus, and evidence of Oaxacan script is limited to that side. The few artifacts on which the inscribed script has been retained are portable stone figurines and large stone monuments. The state of development of the scripts and the few exemplars known suggest that writing must also have been practiced on wood, bark paper and/or skins during the Formative Period. It is almost certain that script literacy was limited to the nobility, although iconographic understanding must have had a much broader base. Any one of the scripts with a large number of depictive signs

must have developed out of, and continued hand in hand with, a visual symbol system of relatively representational depictions, itself evolving in response to both social conditions and the developing scripts.

To judge by the number of signs, the scripts must have been largely logographic, and they must have referred to a relatively small number of activities basically relating to kingship and descent, and to activities associated with creation and destruction of the world. Maya script, which developed out of one of these Formative scripts, has relatively few verbal forms, with a larger number of titles, names, relationship glyphs, numbers and calendric signs. There is no reason to imagine a vastly different writing system for Formative Period societies with iconography that is itself strikingly similar in purpose. The pervasive themes of power and of maize stretch from the earliest Formative times through the latest Postclassic times.

I take writing to imply a system of visually-perceived graphic symbols, the full interpretation of which requires knowledge of a particular language. As the graphic counterpart of speech, writing can be recognized in Mesoamerica by correspondence of its elements to elements of speech, by its linear format (in rows and/or columns) and by its limited number of signs with rule-governed combinatorial capabilities.³²

Linguistic research in Mesoamerica, in addition to its potential for identifying the language underlying any given script by direct comparison of individual glyphs of known sonic values with words in specific languages, can, through structural analysis, also correlate syntactic and semantic structures in the glyphs—for example, introducers, dates, verbs, nouns (subjects, objects, titles, names, kinship terminology, etc.)—with those structures as realized in local linguistic constructions of candidate languages. If larger corpora of Late Formative scripts come to light, it should one day be possible to know which languages they represent. At this point, the Isthmian and Mayan scripts of Late Formative times are the most likely to be identified with particular languages and to be deciphered. We know the format; we think we know the approximate content, and we would very much like to know everything possible about the scripts.

NOTES

- ¹ Michael Coe, 1976. "Early Steps in the Evolution of Maya Writing." In *Origins of Religious Art and Iconography in Preclassic Mesoamerica*, ed. H.B. Nicholson, 107-122. Los Angeles: UCLA Latin American Center; John Justeson. 1986. "The Origins of Writing: Preclassic Mesoamerica." *World Archaeology* 17:437-458; Joyce Marcus. 1976. "The Origins of Mesoamerican Writing." In *Annual Review of Anthropology*, ed. B.J. Siegel, A.R. Beals and S.A. Tyler, 35-67. Palo Alto, California: Annual Reviews, Inc.
- ² Justeson. "The Origins of Writing."
- ³ Linda Schele. 1985. "The Hauberg Stela: Bloodletting and the Mythos of Maya Rulership." In *Fifth Palenque Round Table, 1983*, vol. 7, ed. M.G. Robertson and V. Fields, 135, 138. San Francisco: Pre-Columbian Art Research Institute.
- ⁴ Justeson. "The Origins of Writing," 449-50.
- ⁵ Justeson. "The Origins of Writing," 451.
- ⁶ Fernando Winfield Capitaine. 1988. "La Estela 1 de La Mojarra, Veracruz, Mexico." *Research Reports on Ancient Maya Writing* 16:1-36.
- ⁷ Justeson. "The Origins of Writing."
- ⁸ Brian Stross. 1989. "The Language of La Mojarra Stela 1." Unpublished manuscript, Department of Anthropology, The University of Texas.
- ⁹ 8.5.3.3.5 Thirteen Chicchan 3 Kayab and 8.5.16.9.7 Five Manik 15 Pop respectively: cf. Winfield Capitaine. "La Estela 1 de La Mojarra, Veracruz, Mexico"; John Justeson 1988. "The Non-Maya Calendars of Southern Veracruz-Tabasco and the Antiquity of the Civil and Agricultural Years." *Journal of Mayan Linguistics* 6:1-21.
- ¹⁰ Schele. "The Hauberg Stela," 137.
- ¹¹ Schele. "The Hauberg Stela."
- ¹² Justeson says that writing originated in Formative times "as one aspect of a visual system used ceremonially to legitimate and reinforce elite power and prestige; this would remain the principal function of Mesoamerican writing." Justeson. "The Origins of Writing," 445; cf. Virginia Fields. 1989. "The Origins of Divine Kingship Among the Lowland Classic Maya." Ph.D. diss. The University of Texas at Austin.
- ¹³ cf. Fields. "The Origins of Divine Kingship Among the Lowland Classic Maya; Kent Reilly III 1987. "The Ecological Origins of Olmec Symbols of Rulership." Masters Thesis, The University of Texas at Austin; Brian Stross 1986. "Iconographic Homology on an Olmec Urn and a Maya Plate." Lecture, University of Texas, Texas Maya Glyph Society.
- ¹⁴ I have elsewhere proposed that these can be found in the introductory part of glyph sequences around the rims of certain Classic Maya funerary vessels. cf. Brian Stross. 1990. "The Introductory Formula of the Primary Standard Sequence: Glyphs on Classic Maya Vessels." *Palenque Round Table*.
- ¹⁵ And even here we find that the introductory glyph for the initial series date contains the glyphic name of a patron deity, that of the month of the *haab* referred to in the date.
- ¹⁶ The Classic Maya erected monuments at twenty-tun intervals and sometimes more frequently.
- ¹⁷ For example, a Saturn-Jupiter conjunction, on 2 Cib 14 Mol, used as a time marker at Palenque by the Classic Maya.
- ¹⁸ Peter Mathews. 1979. "The Glyphs from the Ear Ornaments from Tomb A-1/1." In *Excavations at Altun Ha, Belize, 1964-1970*, vol. 1, ed. David M. Pendergast, 79-80. Toronto: Royal Ontario Museum.
- ¹⁹ Justeson. "The Origins of Writing," 439.
- ²⁰ Justeson. "The Origins of Writing," 445.
- ²¹ Stross. "The Language of La Mojarra Stela 1."
- ²² Crossed bands alternate with a single diagonal in the Maya sky glyph. cf. Brian

Stross and Kent Reilly III. 1990. "Sky and Earth: From Icon to Glyph." *Mesoamerica*.

²³ The "na" glyph refers here to catalog numbers 22 and 23.

²⁴ Brent Berlin, Dennis Breedlove and Peter Raven. 1974. *Principles of Tzeltal Plant Classification*. New York: Academic Press, 126.

²⁵ Norman Hammond. 1987. "The Sun Also Rises: Iconographic Syntax of the Pomona Flare." *Research Report on Ancient Maya Writing*, 7. Washington D.C.: Center for Maya Research; Stross. "The Language of La Mojarra Stela 1."

²⁶ Fields. "The Origins of Divine Kingship Among the Lowland Classic Maya, 37.

²⁷ Stross. "The Language of La Mojarra Stela 1."

²⁸ Justeson. "The Origins of Writing," 445.

²⁹ J. Eric S. Thompson. 1971. *Maya Hieroglyphic Writing*. Norman: University of Oklahoma Press, 103.

³⁰ John Justeson, William M. Norman, Lyle Campbell and Terrence Kaufman. 1985. *The Foreign Impact on Lowland Mayan Language and Script*. M.A.R.I. Pub. 53, Tulane University, New Orleans, 43.

³¹ Stross. "The Language of La Mojarra Stela 1."

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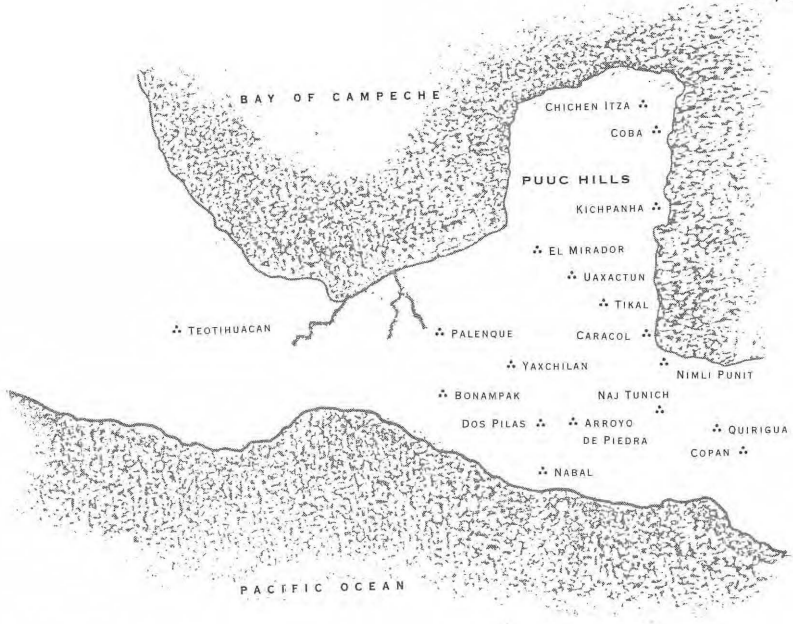


FIGURE 1
 Map of the Maya area.
 (after Houston 1989: figure 11.)

Virginia M. Fields

ABSTRACT

A brief description of the historical approaches to the decipherment of ancient Maya writing is presented in order to provide the background for a description of our current knowledge of the nature and structure of the system. Maya hieroglyphic writing is recognized as a true writing system in that it represents the sounds and structure of spoken language. The writing system is defined as a mixed logographic system containing both pictographic and phonetic elements.

Maya hieroglyphic writing appears in the latter part of the Late Preclassic Period (ca. 150 B.C.–A.D. 100) and is primarily associated with documenting political history and legitimacy. Writing was used to record the events of a ruler's life, validating his right to the throne by documenting his parentage, his accession to power, his conquests, and his performance of important ritual and ceremonial acts. Calendrical information also comprises a major component of Classic Maya inscriptions. Historic events are documented by means of a complex system that both fixes events in time and ties them cyclically to the mythological past.

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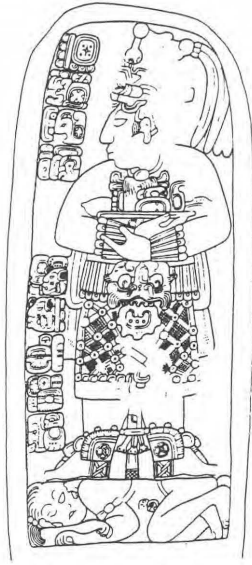
A primary hallmark of ancient Maya civilization is a system of hieroglyphic writing considered to be the most highly developed script in pre-Columbian America. Maya civilization flourished in a tropical area whose modern boundaries encompass eastern Mexico, Guatemala, Belize, and the western portions of El Salvador and Honduras (figure 1). Archaeological evidence indicates that the Maya area was inhabited by at least 1500 B.C., yet it is not until the Late Preclassic Period, extending from approximately 350 B.C. to A.D. 250, that the major social and political changes occurred in Lowland Maya society that resulted in the florescence of Maya civilization during the subsequent Classic Period, which lasted until approximately A.D. 900. Hieroglyphic writing appears as part of a constellation of traits characterizing the newly developed hierarchical social and political order that also includes the construction of massive public architecture and monumental art, economic specialization, intensification in settlement patterns, and the appearance of caches and burials containing prestigious and exotic objects of wealth and status.

Maya hieroglyphic writing is found on a variety of media. Inscriptions are carved or incised on freestanding stone monuments, primarily stelae (figure 2) and pedestals, which are often referred to as altars (figure 3), as well as on masonry architecture, especially lintels (figure 4) and wall panels (figure 5). Texts are also incised on portable objects of stone (figure 6), bone and shell, or painted on pottery and on screenfold bark paper books or codices. Because studies of Maya hieroglyphic writing originally focused on the codices, the content of which is primarily astronomical and divinatory, the historic nature of monumental texts was not generally recognized until thirty years ago.

The study of Maya hieroglyphic writing began soon after the Spanish Conquest in the sixteenth century, when Peter Martyr stated that, "The forms of their letters are nothing like unto ours. But are much more crooked and entangled, like unto fish hooks, knots, snares, stars, and such other...."¹ In 1566, Bishop Diego de Landa compiled his *Relación de las cosas de Yucatán*, a detailed history and description of the Maya of the Yucatán Peninsula.² His account, based on interviews with learned informants, includes an important description of the Maya calendar as well as a so-called alphabet which has proven useful to scholars as a rudimentary syllabary.

FIGURE 2

Naranjo Stela 24, which commemorates events in the life of Lady Six-Sky, a woman from Tikal who married a Naranjo ruler. (After Graham and von Ew 1975: 2:63)



64

FIGURE 3

Caracol Altar 21, which documents a battle between the polities of Caracol, located in western Belize, and Tikal, located in northeastern Guatemala. (After Chase and Chase 1987: figure 27)

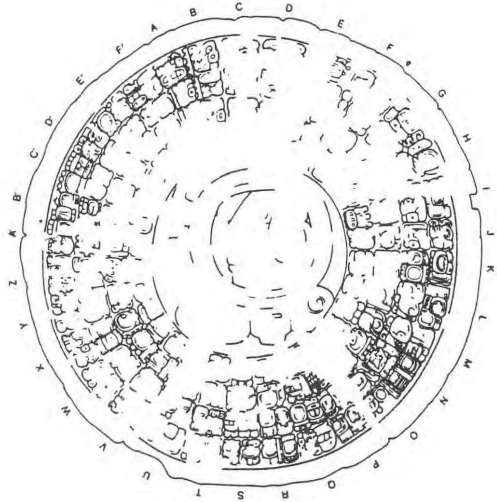




FIGURE 4

La Pasadita Lintel 2, depicting Bird Jaguar, a ruler from Yaxchilan, as the primary actor in a scattering rite commemorating the completion of a ten-year cycle. The figure on the right is the ruler of La Pasadita, a subordinate polity to Yaxchilan.

(After Schele and Miller 1986: figure III.4)

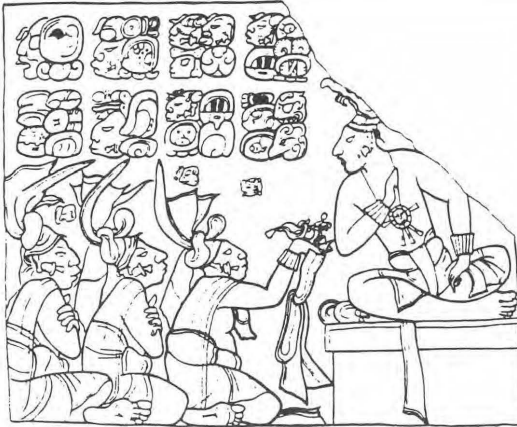


FIGURE 5

Bonampak Sculptured Stone 1, illustrating the accession to office of a ruler at that site.

(After Mathews 1980: figure 9)

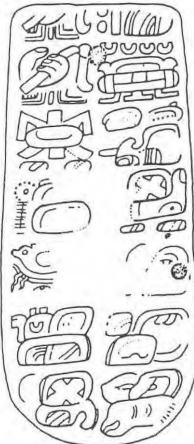


FIGURE 6

Greenstone Celt, Dumbarton Oaks, which contains an early Period Ending date.

(After Schele and Miller 1986: pl. 22c)

De Landa records that, "We found a large number of books...and as these contained...superstition and lies of the devil, we burned them all, which they regretted to an amazing degree." Fortunately, four codices survived destruction, among them the Dresden, Madrid and Paris Codices, named for the cities where they were found in the nineteenth century. The figbark paper of the screenfold books was coated with fine white lime and then painted with columns of glyphs and images of divinities, animals and other objects involved in ceremonies and rituals. The books, containing horoscopes and almanacs to assist priests in ceremonies and divinations, were then bound between decorated boards. The codices vary in length when completely unfolded: the Madrid Codex has 56 leaves (112 pages) and measures nearly 7m in length; the Dresden Codex has 39 leaves (78 pages) and it is 3.5 m long; and the fragmented Paris Codex has eleven surviving leaves (22 pages) and is 1.45 m long.³

A fragmentary fourth book, known as the Grolier Codex after the club in New York where it was first displayed, deals entirely with Venus almanacs. Fragments of disintegrated and highly eroded codices have also been found in a few Classic Period tombs, most recently in the excavations of a seventh century house in El Salvador.

The mid-nineteenth century explorations of an American traveler and a British architect, John Lloyd Stephens and Frederick Catherwood, brought Maya monumental inscriptions to the attention of scholars and the public alike.^{4,5} Stephens and Catherwood traveled throughout Mexico and Central America, and while Stephens wrote vivid narratives of their discoveries, Catherwood drew amazingly accurate depictions of the ornate architecture and intricate sculpture that the explorers encountered. Although Stephens expressed his belief that the monuments contained the histories of the sites he visited, scholars of Maya writing during the following century instead directed their energies towards elucidating the nature of the Maya calendar.

Between 1880 and 1905, the fundamental principles of the Maya calendar and vigesimal system of numeration were defined. Other scholars had catalogued the deities pictured in the codices and identified their glyphic names, deciphered the glyphs for colors and directions, and had suggested correlations for the Maya and Western calendars.

Explorations of the Maya Lowlands by Carnegie Institution archaeologist Sylvanus Morley during the early decades of the twentieth century greatly increased the corpus of Classic Period inscriptions.⁶ The

emphasis on calendrical matters in the codices was extended to monumental inscriptions, leading to the development of refined site chronologies.

The modern era of decipherment began in the late 1950s with the presentations by Heinrich Berlin and Tatiana Proskouriakoff of convincing evidence of the historical content of monumental inscriptions and with Yurii Knorozov's demonstration of phoneticism in Mayan glyphic texts.⁷ Berlin identified an important class of sign sequences that he called "emblem glyphs."⁸ The consistent representations of emblem glyphs in certain patterns of occurrence led him to conclude that they represented either the names of ruling dynasties or the names of the cities where they appeared. Most scholars now believe that emblem glyphs refer to polities or city-states larger than a single site or dynasty.

Proskouriakoff noted a regular pattern of dates on groups of monuments associated with architectural groups at the site of Piedras Negras.⁹ She found that the pattern of dates within monumental groups corresponded to the length of an average human life span, enabling her to demonstrate that recorded dates commemorated historical events in the lives of named rulers and their families. There is now no question that the primary content of monumental inscriptions concerns the histories of specific polities. Texts record the reigns of rulers, their political fortunes and genealogies, marriages, alliances and conflicts. The recognition of this historical information has significantly altered our understanding of Maya civilization, and detailed dynastic histories have been constructed for the major polities of the Maya realm.

A significant dynastic history was produced in 1973 by a group of scholars, including Linda Schele, Peter Mathews and Floyd Lounsbury at Palenque, situated along the western boundary of the Maya realm.¹⁰ The limestone at Palenque is ill-suited for columnar stelae but ideal for creating large wall panels, and these lengthy texts have been the source of one of the most extensive and elaborate dynastic histories produced in the Maya Lowlands. Scholars have been able to reconstruct not only the human history of the rulers at Palenque but have also gained insights into Maya concepts of the nature of divine kingship. The human actions of kings and queens and their relations and interactions with supernaturals and the cosmos are presented in literary and poetic detail at Palenque.

In 1952, Yurii Knorozov began publishing a series of studies that addressed the issue of phoneticism in the Maya script. Knorozov utilized the so-called alphabet documented by Bishop Diego de Landa in the sixteenth century. Landa, working with a native inform-

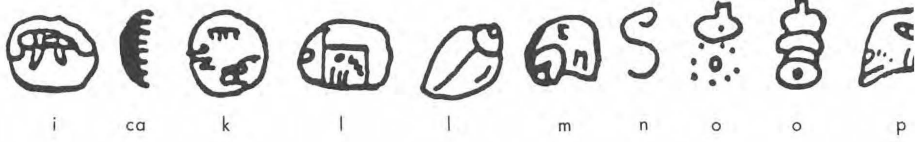
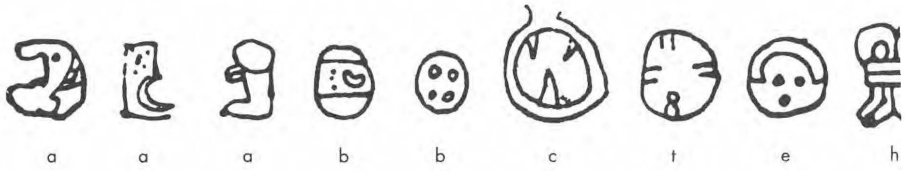


FIGURE 7
Landa's "syllabary,"
 illustrating the Maya signs
 for sounds corresponding
 to the Spanish alphabet.
 (After Pagden 1975: 125)

ant, had elicited Maya names for the sounds of the Spanish alphabet rather than a Maya alphabet. For example, for the sound of the Spanish letter *a*, Landa's informant produced the Maya sign for the word *ak*, which means 'turtle,' and is represented by a turtle's head. In other words, Landa unwittingly produced a partial Maya syllabary (figure 7). Knorozov also demonstrated that Maya words, frequently in the form of consonant-vowel-consonant, were produced syllabically by combining two consonant-vowel pairs. The final vowel, which often mirrors the initial vowel sound, according to Knorozov's principle of synharmony, is not pronounced.¹¹

Maya words can be written either phonetically, by combining consonant-vowel pairs, as demonstrated by Knorozov, or by representing words pictorially. For example, the name of the prominent Palenque ruler Pacal, whose name literally translates as "hand-shield", can be represented as either a picture of a shield or by combining the phonetic elements *pa-ka-la*. The same phonetic elements are found in the name of the ruler K'ak'upacal from Chichen Itza, located in the northern reaches of the Yucatan Peninsula (figure 8).

By combining the historic approach and linguistic methods, epigraphers have dramatically increased our understanding of the nature and content of Maya hieroglyphic writing. Floyd Lounsbury pioneered an approach utilizing paraphrased reconstructions that approximate the content of hieroglyphic texts in modern Maya languages. Lounsbury has subsequently identified couplet structures in verbal phrases and other syntactic structures.

Epigraphers generally agree that Maya hieroglyphic writing is a mixed logosyllabic script containing about eight hundred known signs. Many spellings are partially phonetic and many are purely logographic. Different glyphs may sometimes carry the same phonetic value, and a major task for epigraphers is to discover patterns of equivalence and substitution in the use of signs.

Hieroglyphs are classified by form and size as main signs or as affixes, which may be either pre-

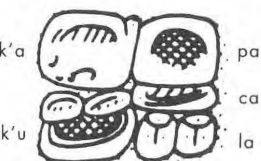


FIGURE 8

The name glyph of K'ak'upacal, a Late Classic Period ruler from Chichen Itza.
(After Houston 1989: figure 9)

fixes or postfixes. The typical reading order of a columnar text is left to right and top to bottom (*figure 9*). The syntax of the inscriptions mirrors that of spoken Maya, that is, intransitive constructions are represented by a verb-subject word order, and transitive constructions are typically represented by verb-object-subject constructions. Verbs are commonly preceded by calendrical statements. Proskouriakoff was able to identify the events depicted on the monuments at Piedras Negras and, later, at Yaxchilan, by identifying the consistent structural occurrence of certain glyph groups. The structural approach allowed Proskouriakoff to identify semantic interpretations of glyph groups without specifying a phonetic reading.

70 Important recurring events on the monuments of Maya rulers include birth, heir designation, accession to the throne, warfare, capture and the sacrifice of captives. Raiding and warfare were commonly tied to astronomical cycles, especially to the cycles of Venus and Jupiter.

Also documented in monumental inscriptions were personal acts of sacrifice by the ruler and his retinue, especially the ritual act of bloodletting performed on periodic occasions (*see, for example, figure 4*) and at such important events as accession to the throne. The final events of a ruler's life—his death, burial and apotheosis—were also occasionally recorded.

A proportionately large number of monumental texts consist of the ruler's name, titles and genealogy. In general, Classic Period monumental texts functioned to commemorate and legitimize the actions of rulers by expressing not only their links with their historical ancestors but also with their supernatural forebears. The complex calendrical system of the Maya was utilized to demonstrate the structural parallels of historic and mythological events in order to provide the ancestral and supernatural sanctions required for political authority.

The pace of decipherment has increased rapidly in the past decade because of the multidisciplinary contributions of art historians, linguists and archaeologists. Scholars are currently refining dynastic lists and clarifying relationships among rulers of contemporary sites as well as identifying subsidiary lords within various polities. Glyphic expressions of kinship relations are providing important insights into royal inheritance within a lineage as well as marriage alliances between polities.

The nature of pottery texts has recently been elucidated by a number of scholars in the United

States and Europe.^{12,13} The glyphic names of objects (such as plate, bowl, etc.) have been deciphered, as well as the names of the owners or patrons who commissioned the objects. The names of the individual scribes who painted the texts also may appear.¹⁴ A vessel from the site of Naranjo in northern Guatemala, for example, is signed by the son of the local ruler, indicating that the children of nobility were also skilled craftsmen.

The Maya also named their buildings and monuments: a stela may be referred to as a *tetun* or 'tree-stone,' and pyramids are equated with sacred hills. The Maya words for various jade ornaments, stone vessels, shell trumpets and other objects have also been recently deciphered.

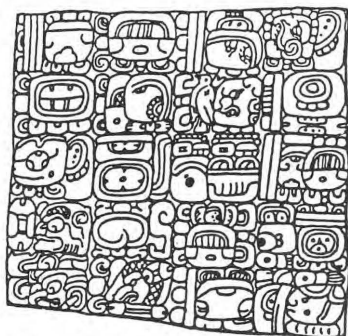
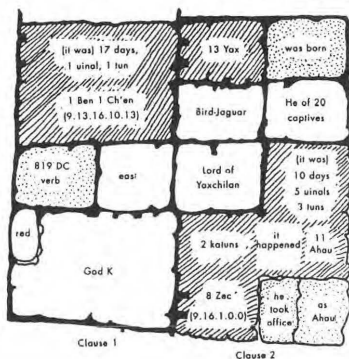


FIGURE 9

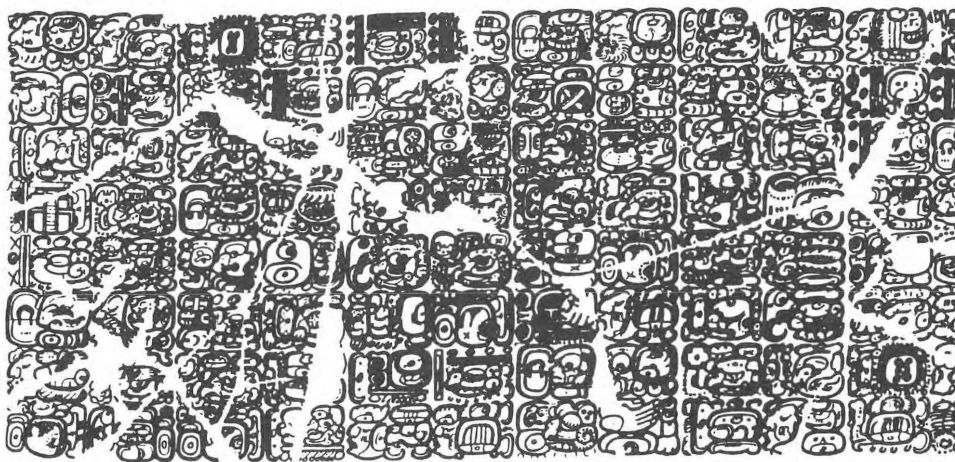
Yaxchilan Lintel 30, illustrating the reading order and syntactic structure of Mayan hieroglyphic texts. (After Schele 1989: 54)



Scholars have recently made comparisons of glyphic texts with ethnohistoric documents, such as the *Popol Vuh*, the creation myth of the Highland Maya Quiche people, and with post-conquest chronicles. These discourse analyses have led to a greater understanding of the literary devices utilized in glyphic texts, such as couplet structure and redundancy.¹⁵

Our understanding of Maya hieroglyphic writing and its role in representing Maya thought, culture and history has increased dramatically over the course of the past century. Calendrical studies were followed by historical analyses which in turn have benefited from linguistic methodologies. As our knowledge of the components of the Maya writing system increases, so too does our appreciation of the literary abilities of Maya scribes. The Tablet of the 96 Glyphs from Palenque, for example, exemplifies both visual and poetic beauty (*figure 10*). Like most monumental texts, the inscription relates dynastic history, yet the skill of the scribe is revealed not only in his outstanding calligraphy but also in his use of elegant metaphorical expressions for the passage of time.

Despite the progress that has been made, many inscriptions remain to be deciphered, and many texts contain glyphs whose meanings are understood, although their precise reading is unknown. Their silent stone monuments continue to challenge those who seek to learn about the world as perceived and recorded by the ancient Maya.



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FIGURE 10

Palenque Tablet of the 96 Glyphs, commemorating the first katun anniversary (equivalent to twenty years) or the accession of Bahlum K'uk.
(Drawing by Linda Schele)

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**PRE-HISPANIC PICTORIAL COMMUNICATION:
THE CODEX SYSTEM OF THE MIXTEC
OF OAXACA, MEXICO**

Nancy P. Troike

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The Mixtec have long inhabited the rugged mountainous area in the western half of what is now the modern Mexican state of Oaxaca. In the pre-Hispanic period, the Mixtec people were socially stratified, and the hereditary nobility placed a high value on knowledge of their genealogy and ancestors and the activities of those ancestors as rulers and statesmen, for an understanding of the past was essential to prove their right to govern. Before the Mixtec discovered a method of recording this history, all information had to be entrusted to memory. But human memory can be both fragile and fallible. Vital data may be lost forever through an unexpected death; and despite the best of intentions, facts may become corrupted or confused. In an effort to ensure the accurate retention of essential genealogical and historical accounts, the Mixtec institutionalized their memory of the past by making it the duty of their priests to memorize this crucial information.

At a time that scholars have not yet been able to specify, Mixtec artists began painting pictures of events and assigning specific meanings to certain designs in their drawings; some of the elements in their scenes were based directly on phrases and names in the Mixtec language. With the creation of this pictorial system, the Mixtec finally found a permanent and unchanging way to preserve information, one that was no longer dependent upon human lifespans or memories. Early versions of these scenes have not survived but might have been drawn on large cloth sheets called *lienzos*, a format widely used in Mesoamerica. But by at least A.D. 1400, and perhaps considerably earlier, a new format came into use, that of the codex. Codices were made of leather: wide strips of animal hide were glued together end to end to form a single, long continuous strip, and folds were then made in alternating directions across this strip to create pages (*figure 1*). Because of their screenfold form, codices folded compactly to a size similar to that of a modern book; and, like books, they were normally opened so that two pages were visible side by side.

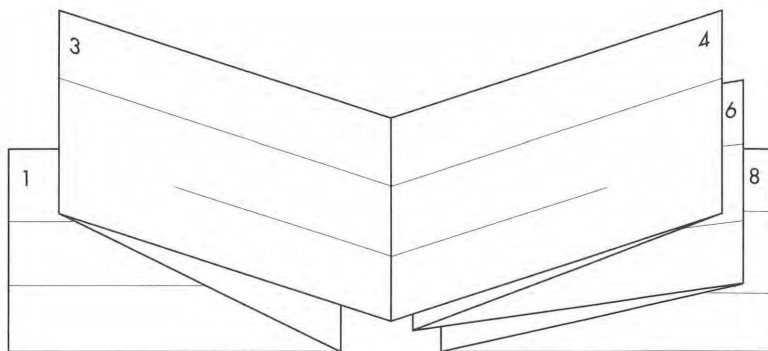
ABSTRACT

This paper summarizes the nature of the pre-Hispanic pictorial communication system used by the Mixtec people of Mexico, who were creating manuscripts in which they recorded their histories, genealogies and religious beliefs long before the Spanish reached the New World. The principal pictorial conventions are explained, and each is illustrated with an example from one of the surviving manuscripts.

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The post-Hispanic *lienzos* that are known today from the Mixtec region are large and often contain depictions of numerous events, but usually there is very little internal structure to indicate the order in which the scenes should be read. If these characteristics were also true of pre-Cortesian Mixtec *lienzos*, then an important reason for the adoption of the codex format, with its relatively narrow width but extensive length, may have been the control this new form imposed upon the arrangement of the scenes. The more exact the sequence in which the painters depicted their information, the more accurately this sequence could later be interpreted. To eliminate all possible ambiguity concerning the order in which the pictorial episodes should be read, the Mixtec artists marked the pages of their codices with a pattern of red guidelines that were drawn so as to create one single band of space that meandered back and forth across the pages for the length of the manuscript. (See figure 1 for an example of these guidelines.) With the introduction of this strict structure, all the pictorial data in a text were channeled into a single continuous stream of information in which the painters normally depicted events in chronological order.



Only four pre-Hispanic Mixtec codices have survived. The Codex Zouche-Nuttall (*Add. MS.* 39671), now in the British Museum, London, is painted on both sides; one side depicts the life history of a great Mixtec warrior and politician while the other side relates mythic-historic events and genealogical sequences. The Codex Bodley (2858) is held by the Bodleian Library, Oxford; both of its sides are comprised principally

FIGURE 1
The screenfold form:
a typical codex.

of long genealogical sequences. The Codex Vindobonensis (*Mexicanus I*), in the Österreichische Nationalbibliothek, Vienna, shows on one side the story of the creation of the Mixtec region and, on the other, displays a series of genealogies. The Codex Colombino-Becker, which gives a detailed life history of the same Mixtec ruler as does the Codex Zouche-Nuttall, is now fragmented and incomplete; the Colombino sections (*No. 35-30*) are in the Museo Nacional de Antropología, México, while the Becker parts (*Nr. 60306*) are found in the Museum für Völkerkunde, Vienna. In addition, there is also one early colonial codex whose scenes are painted entirely in the pre-Hispanic style: the Codex Selden (*3135 [A.2]*), in the Bodleian Library, Oxford, contains genealogical sequences and some historical events. (Photographic facsimilies of all these manuscripts have been published and are listed in the additional bibliography at the end of this article.)

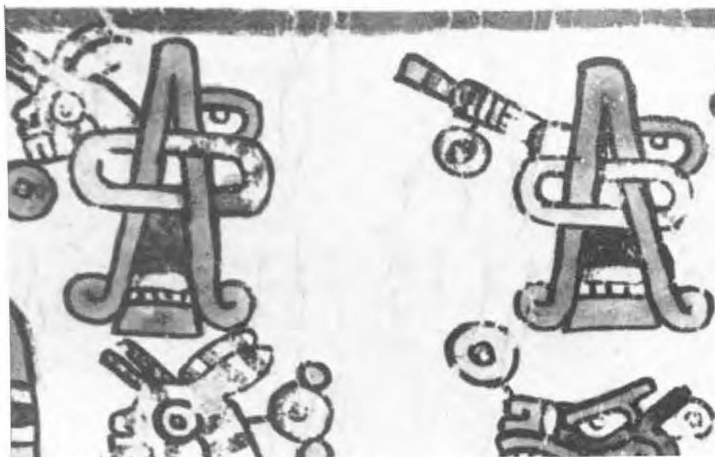
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In creating their codices, the Mixtec artists had three important decisions to make concerning the physical form of the manuscript: how to orient the strip, at which end to begin the pictorial text and what pattern to use for the red guidelines. A codex may be unfolded so that its length is extended either horizontally or vertically; the sequence of the scenes may begin at either end of the strip; the guidelines may be drawn on the strip either parallel to its long length or at right angles to its length. There are examples of almost all possible combinations, showing clearly that there was no "standard" way to organize a pictorial text. The Codex Zouche-Nuttall has both sides oriented horizontally; both are read from the right end of the strip to the left end, and both have the red guidelines at right angles to the length. The Codex Vindobonensis has both sides horizontally oriented and read from right end to left end, but the obverse side has the red guidelines at right angles to its length while the reverse side has these lines placed parallel to its length. The Codex Colombino-Becker, painted on only one side, is horizontally oriented and read from the left end to the right end, with its guidelines parallel to its length. The Codex Bodley has both sides horizontally oriented and with the red guidelines parallel to its length, but the obverse side is read from the left end to the right end while the reverse side is read from the right end to the left end. The only extant manuscript to be oriented vertically is the Codex Selden, which is read from bottom to top and has its guidelines at right angles to its length; it is painted on only one side.

Whether the Mixtec texts on *lienzos* is not known, but whatever the milieu may have been, they apparently used it to refine the shape and form of their pictorial conventions and to come to agreement on the meanings of certain types of drawings and scenes. All the extant Mixtec codices share the same basic conventions, already complete and fully established with the same meanings.

The most ubiquitous of the pictorial conventions in the Mixtec codices are those for the dates of events and the names of the people involved. The calendar system used by the Mixtec dated events through a date count of 260 days and a year count of 52 years. The day count was composed of twenty day names and the numbers 1 through 13, with each of the day names and each of the numbers combining together in turn to name successive days until all 260 different combinations had been used, after which the cycle began again. The year dates were composed of four of these day names which each combined in turn with the numbers 1 through 13, giving a matrix of fifty-two different year dates, after which this cycle also repeated. Year dates were always depicted with a design resembling an interlaced A and O to distinguish them from day dates (*figure 2*). Small circles were drawn to represent the numbers associated with both year and day dates.

In the codices, all Mixtec bear as their formal name the date of the day on which they were born. However, this custom of naming people for their birth date results in a universe of only 260 different names for all persons. It should not be surprising, therefore, that each person was also given another name, which modern codex specialists call a "personal name," and that these personal names vary greatly. Each Mixtec figure pictured



in the codices was identified by a drawing of the appropriate calendar name, representing the day of birth, and another drawing showing the personal name. By this combination of the two names, any individual can be distinguished from all the other hundreds of persons depicted in these manuscripts. While scholars have long been able to read the dates and the day names, they have been hampered in interpreting the personal names because many of the objects shown in those names have not yet been identified.

Because the Mixtec artists were able to paint a person's full name in their texts, they never found it necessary to develop a portraiture genre to identify individuals. Furthermore, with the name being all that was necessary to specify fully the identity of a person, the codex figures did not need to be individualized but could be drawn without personal characteristics. When there was no particular need for human figures to be shown, these could be eliminated and only the names themselves depicted; a parentage statement for a bride would always contain the names of her father and mother but not necessarily their figures. A remarkable example of the use of only the names of individuals occurs on the final painted page of the reverse side of the Codex Vindobonensis; the artist, apparently in great haste to complete his text, stopped drawing the figures and painted only the names of the individuals involved in the last few marriages and births.

It is in the depictions of the names for localities, however, that the Mixtec codex pictorial communication system reached its most advanced state and its most intimate connection with the Mixtec language. Land occupies a particularly important place in Mixtec life because the region is so mountainous that areas suitable for growing food are often quite scarce. The ownership and control of land is thus extremely important: land means life. Arguments over land in the region are deep seated and long lasting, and some boundary disputes between towns have gone on for centuries. Being able to demonstrate through the drawings in a codex that a particular location was the property of a certain family or town consequently might be crucial to survival.

Alfonso Caso,² the great Mexican student of the Mixtec codices, was the first to interpret the pictorial linguistic code being used in these manuscripts for the "place signs" that represent localities. He knew from a sixteenth-century Spanish document that the Mixtec name of the important town of Tilantongo meant "black earth," and then, in a copy of a post-Hispanic map, Mapa de Teozacoalco (*JGI XXV-3*, Benson Latin American

FIGURE 2

Typical year and day dates in the Codex Bodley (4-11).¹ On the left, the dates are the Year 1 Rabbit, Day 1 Rabbit; on the right, the Year 1 Reed, Day 1 Alligator.

Collection, University of Texas, Austin), he encountered a place sign having a black and white base (*figure 3*) and realized that this represented the name of Tilantongo.

The work of later scholars, particularly Mary Elizabeth Smith, has shown that the place signs drawn in these codices directly picture the *Mixtec* name of the particular locality. If there was ever any question whether these codices had been painted by the Mixtec, doubts were totally resolved with the discovery of this direct linguistic evidence.

Because Mixtec is a tone language, there are many opportunities for substitutions and visual play on words in the depictions of place names. Caso noted that the Mixtec name of the town of Teozacoalco meant "great foundation" and that in the Mapa de Teozacoalco the place sign drawing contained a small figure folding or bending a base, and he concluded that these elements

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FIGURE 3
The place sign for
the town of Tilantongo
in the Codex Bodley
(17-II).

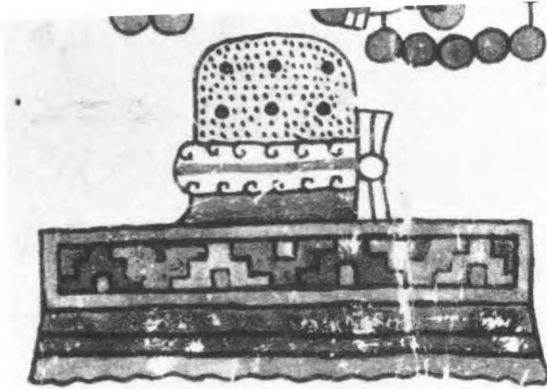


FIGURE 4
The place sign for the
town of Teozacoalco
in the Codex Bodley
(15-III).



**FIGURE 5**

The place sign for the town of Magdalena Jaltepec in the Codex Selden (6-11).

**FIGURE 6**

The place sign for the town of Magdalena Jaltepec in the Codex Vindobonensis (42-IV).

conveyed the idea of the name (*figure 4*).³ Smith was able to explain the linguistic basis for the place sign: the small figure was “breaking” the foundation, that word being a homonym with “great” except for differences in tone—and much easier for the painters to depict.⁴

At least one case of dialectal differences in the pictorial representation of the name of a town has been found among codex place signs, reflecting the linguistic diversity of the Mixtec region. In the Codex Selden, Smith identified the place sign for the town now called Magdalena Jaltepec (*figure 5*) and noted that the “jawbone” element of the name represented the initial locative *a-* in the town’s Mixtec name of *Añute*.⁵ This particular locative occurs in Mixtec principally in Nochixtlán valley, where Magdalena Jaltepec is located. In the Codex Vindobonensis, however, the place sign for Magdalena Jaltepec is pictured without the jawbone element (*figure 6*), indicating that this codex did not originate in the Nochixtlán valley.

The ability of the Mixtec painters to depict in their manuscripts the exact name of a locality meant that they had no need of realistic drawings to specify these places, and landscape painting never developed as a genre.

Because of the social stratification that characterized pre-Hispanic Mixtec society, accurate genealogical information was vital in determining the rights and duties of individuals. There was consequently a need for pictorial conventions that would enable the necessary genealogical data to be preserved, especially the major life crises of birth, marriage and death. Marriages were pivotal because they were not only the source of future rulers but also had great political significance in uniting families and the towns they controlled. Marriage was indicated by picturing a man and woman facing one another, usually seated on a woven straw mat (*figure 7*). The births of children were shown by drawing them immediately after the marriage of their parents (*figure 8*). Since inheritance normally passed through male primogeniture, the first son was usually depicted first, as his father's heir, with the rest of his siblings following. At times, some children were shown at their birth also facing their spouse, to indicate the person that child would marry when grown. A normal death was very rarely depicted in the codices but when it was, the person was shown as a bundle wrapped in cloth for burial (*figure 9*). The deaths most likely to be depicted were those that occurred violently, such as a murder or a sacrifice.

Other pictorial conventions are connected with the various phases of war. As shown in figure 10, the chevron path indicates that the warrior "walks to the enemy."⁶ His conquest of the locality is shown by

FIGURE 7

The pictorial convention for marriage is a man and a woman seated facing one another, as shown here in the Codex Zouche-Nuttall (26-III).



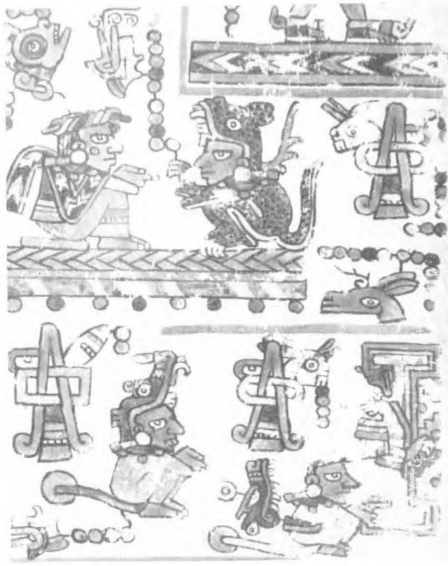


FIGURE 8

The pictorial convention for the birth of children is to depict them immediately following their parents' marriage. In the Codex Bodley (34-R-II-III), the marriage of Lady 6 Monkey to Lord 11 Wind, shown in the upper band, is followed in the lower band by the births of their two sons.



FIGURE 9

The pictorial convention for a normal death is to depict the dead person as a bundle, as pictured here in the Codex Bodley (28-II).

the arrow projecting from its place sign, and his victory is further enhanced by his capture of the ruler of that town, whom he grasps by the hair. All these variations allowed the painters considerable flexibility in stating the degree of a conflict and in explaining the nature of its outcome.

Analysis of postures and gestures have enabled still other pictorial conventions to be identified. The physical position assumed by warriors in scenes of

attack and conquest indicates "hostility" (*figure 10*). Another posture shows that a person is "dedicated to traveling on a sacred mission" (*figure 11*); that is, engaged in a sacred journey that must be completed.⁷ As an illustration of how Mixtec artists could combine various conventional drawings to create new meanings, this pose of dedication to traveling on a sacred mission can be combined with the chevron band that signifies walking to the enemy in order to show that a person is on a sacred journey that carries him into enemy territory but that he is not hostile nor engaged in warfare (*figure 12*). In the Codex Colombino-Becker, a very unobtrusive system of hand gestures functions to indicate which person in a scene had made a request and which had agreed to carry



FIGURE 10

This scene shows the pictorial conventions in the Codex Bodley (10-11) representing war, conquest and capture. The physical posture of the standing warrior indicates that he is hostile, while the chevron path on which he stands means that he "walks to the enemy"; in other words, he is going to war. On the left, two arrows pierce the place sign to show that it has been conquered, and the rope around the neck of its seated ruler reveals that he has been taken prisoner.



FIGURE 11

The pictorial convention that means an individual is dedicated to traveling on a sacred mission is represented by the posture shown here in the Codex Colombino-Becker (4-III).



FIGURE 12

Various independent pictorial conventions can be combined to specify situations more precisely. In this scene from the Codex Colombino (19-III) part of the Codex Colombino-Becker, the chevron path retains its meaning of "walking to the enemy," but the warrior's posture indicates that he is dedicated to travelling on a sacred mission. The combination of the two conventions means that the warrior is not going to war but is merely crossing enemy territory en route to his destination.



out that request (*figure 13*).⁸ In the Codex Bodley, an apparently insignificant matter—whether figures were shown using seats with round or square corners—was actually serving to distinguish the dominant and submissive persons in meetings and marriages.⁹

In their codices, the Mixtec used a sophisticated pictorial communication system to record the information they considered essential so that it could be preserved for the use of future generations. The artists created designs to express this knowledge and manipulated these depictions to express additional meanings. All during the twentieth century, scholars have slowly been determining the manner in which the Mixtec codex scenes were understood by their original readers. The manner of dating events, naming people and presenting genealogical events is basically understood. The functioning of the linguistic elements in the place sign drawings, clearly demonstrating that these names are in the Mixtec language, proved that these manuscripts had been created by the Mixtec. It is possible that additional direct linguistic references may be found in these codices among the great number of visual clues given by the clothing and jewelry, the postures and gestures, and the actions and activities of the hundreds of figures pictured in the texts. The system, which has long been locked mutely into these colorful pictures, is gradually yielding to the work of an international group of codex specialists, and steps are now under way to teach the Mixtec themselves to interpret these documents that record their own ancient history.

FIGURE 13

The hand gestures shown by figures in the Codex Colombino-Becker convey specific meaning. In this scene from the Codex Becker (5-11), the gesture by the man on the left means that he is making a request, while the gesture of the man on the right indicates that he is agreeing to carry out that request.

NOTES

- ¹ Mixtec codex citations can be compared to Biblical citations, which consist of the book, chapter, and verse number so that any published version of the Bible can be used to locate a citation. A full Mixtec codex citation includes only the name of the codex, the page number in Arabic numbers, and the band number in Roman numerals, and in this way a reproduction of that codex can be used to locate the scene.
- ² Alfonso Caso. 1949. "El Mapa de Teozacoalco." *Cuadernos Americanos* 47 (5): 153. México.
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- ⁴ Mary Elizabeth Smith. 1973. *Picture Writing From Ancient Southern Mexico: Mixtec Place Signs and Maps*. Norman: University of Oklahoma Press, 57-58.
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- ⁶ Smith. *Picture Writing*, 33.
- ⁷ Nancy P. Troike. 1982. "The Interpretation of Postures and Gestures in the Mixtec Codices." In *The Art and Iconography of Late Post-Classic Central Mexico*, ed. Elizabeth H. Boone, 195-198, Washington, D.C.: Dumbarton Oaks.
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EVOLUTIONARY TRENDS IN MESOAMERICAN HIEROGLYPHIC WRITING

John S. Justeson and Peter Mathews

ABSTRACT

This paper surveys the origin and development of the representational conventions of Mesoamerican writing systems. Writing probably grew out of the iconography of ceremonial celts, with which it shares many representational conventions; this iconography was used throughout Mesoamerica. Writing per se seems to have taken shape during or just before the period in which state-level political organization was emerging, in at least two separate regional traditions. Many of the representational features of these scripts are understandable in terms of the structures of the languages they represented and the patterns of development often resemble those of Old World systems. Other features are understandable in terms of the close relations that Mesoamerican writing maintained with iconography.

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This paper summarizes our investigations into the structure and development of Mesoamerican hieroglyphic systems, both in their visual organization and in their relationships to Mesoamerican languages. The first section argues that these scripts emerged from the iconography of Mesoamerican ceremonial celts, perhaps via a single ancestral hieroglyphic system. The existence of a non-iconographic common ancestor is largely hypothetical, this stage of writing being attested poorly if at all; we infer the main features of such a script from those common to the earliest attested systems. These early systems we classify into two basic groups, the Oaxacan and Southeastern scripts; the Southeastern group itself had an Isthmian branch spanning the Isthmus of Tehuantepec, and a Maya-Izapan branch running from the Yucatan Peninsula south to the northern borders of El Salvador. The remainder of the paper treats the radically different developmental trajectories of the Oaxacan and Southeastern script traditions.

Mesoamerican writing systems can be usefully compared, structurally and developmentally, with writing systems from other culture areas. However, they have only recently begun to enter more general discussions of the history of writing, long dominated by Egyptian and Mesopotamian traditions. In large part this is because Mesoamericanists themselves have concentrated on traits specific to Mesoamerican cultures and scripts, rather than addressing general representational and historical issues. It is due also in part to the amount of data on which general formulations can be based and decipherments secured. Compared with the evidence of script development in the Old World, the written record in Mesoamerica is spotty; the most basic historical relations among scripts have, at least until recently, been more a matter of conjecture than of argumentation. Texts for some scripts number in the dozens and fewer; the Mayan script, far and away the best-represented system, has only a few thousand partially legible texts. Most texts are quite brief, though some number in the hundreds and, in Mayan, even into the thousands of signs. Accordingly, many ideas that the data suggest cannot be tested definitively.

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Nonetheless, much of the data is quite revealing, and similarities and differences between Mesoamerican and early Near Eastern developments are briefly mentioned throughout this paper. The Mesoamerican material, in fact, has several special advantages for students of writing and its evolution. Most of the languages being written descend directly from languages reconstructable by historical linguists, independent of the evidence from the writing systems themselves; thus, it is possible to investigate relations between language structure and script development more rigorously than in any Old World system. Suggestive links between the earliest written texts and earlier iconographic symbolism suggest closer ties between representational art and the emergence of writing than have been demonstrated elsewhere. Particularly in the case of Mayan, texts are reliably dated in an absolute chronology, and significant representational variation and change can be monitored across six hundred years of this chronology. Finally, the history of Mesoamerican writing is of interest in part because of its peculiarities. For example, linguistically, the Oaxacan tradition exemplifies script “devolution,” decreasing the closeness of its correspondence with any spoken language; visually, Mayan writing developed a non-linear organization of its signs into blocks.

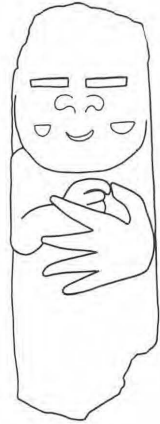
THE ORIGIN OF MESOAMERICAN SCRIPTS

A Precursor System¹

It is widely thought, though not universally accepted, that Mesoamerican writing owes its origin to Olmec-style iconography,² a pan-Mesoamerican system of religious and political art that functioned within a pan-Mesoamerican ceremonial complex.³ This section focuses on the iconography of incised ceremonial celts, apparently used in rituals of this complex.⁴ We argue that it was in the iconography of these celts that representational conventions were used from which those of writing can be seen to have emerged.⁵ This suggests that writing grew out of celt iconography in particular.

One feature shared by Olmec iconography and Mesoamerican hieroglyphic writing that suggests some kind of historical relation between them is a *pars pro toto* principle of representation.⁶ In Mesoamerican writing, very few signs represented an animal, person, or supernatural by depicting its full figure, a contrast with Egyptian hieroglyphic canons; instead, the head alone was depicted. Similarly, profile and full-frontal faces serve as conventional icons throughout Olmec-style iconography;

a.



b.

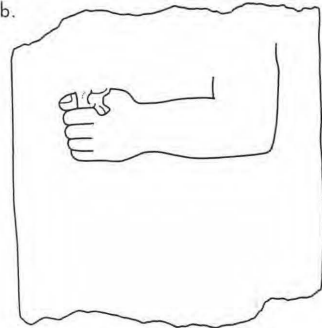
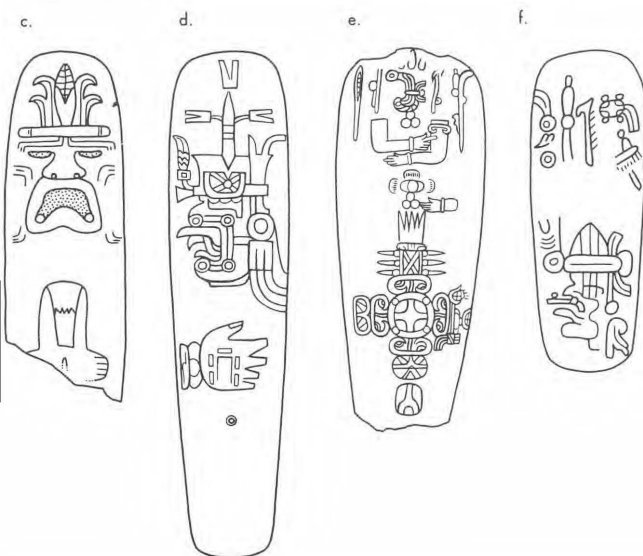


FIGURE 1

Precursor iconography and its iconographic sources.

- a. San Lorenzo Monument 41, with disembodied hand, and
- b. Monument 42, with disembodied arm;
- c. celt from El Sitio (near Izapa);
- d. celt of unknown provenance;
- e. the Humboldt Celt;
- f. celt from Tlaltenco, Valley of Mexico.



though their meanings are not secure, most are thought to refer to supernatural entities or elite humans. In the iconography, a fuller range of variation is found, with full-figure representation being typical, but this is not the case in celt iconography. The incised ceremonial celts normally present elements of an anthropomorphic figure (figure 1). A face, a mask or head ornamentation always occurs at the top, with no body; typically, hands, arms or legs are placed below, delimiting a region that the body would occupy were it depicted.

Other features of the iconography have pretty clear developmental significance for the emergence of writing. Many depictively opaque icons that did not contribute pictorially to scenes were evidently used to encode particular concepts or associations. These icons appear in all media and styles of presentation. The existence of conceptually-specific graphic units with no direct depictive interpretation may have stimulated or supported other developments that are virtually restricted to ceremonial celts, all involving the depiction of parts or accoutrements of a human figure without depicting the figure itself. One such convention is the representation of manual actions by depicting the hands or arms in a revealing posture (figures 1d and e)—sometimes in identifiable gestures, at other times seemingly in the performance of casting rituals documented in later iconographic and ethnographic sources. Another is the grouping in free

space of paraphernalia normally worn or held by figures in Olmec-style art (*figures 1e and f*); we interpret these groupings as statements attributing the statuses and/or roles that are conveyed in normal depictions of these objects, and, presumably, in their actual use. The lower body was also sometimes involved: on the El Sitio celt (*figure 1c*), legs are depicted with a long, decorated loincloth. We refer to such depictions as “isolated” or “segmental” forms.

This excising of visual forms from their normal relations to pictorial art appears to have evolved within the Olmec iconographic tradition. Rudimentary versions of the segmental hand and arm icons go back to the earliest known Olmec art (c. 1150-1050 B.C.), the monolithic basalt Monuments 41 and 42 of San Lorenzo (*figure 1a-b*).⁷ Proskouriakoff discusses these as having a “pictographic intent”; of the more complete Monument 41 she observes that, given the absence of most anatomical features, it “can hardly be a pictorial representation; it is more like a composition of signs of conventional meaning: a visage and gesture.”⁸ Even in the more developed phase characterized by the later incised celts, the source of these forms in the canonical tradition is reflected in their anthropomorphic placement, roughly where they would be were they part of a complete figural depiction. This source is also suggested by the full range of variation of celt iconography. Only one surface on an Olmec-style celt is carved. On celts with relief-carving,⁹ the entire surface is carved, so that the celt itself constitutes a single figure; on a few incised celts,¹⁰ a single figure is depicted, occupying most of the available space. The anthropomorphic organization of the majority of incised celts, with the upper portion consisting of elements excised from an anthropomorphic model, is therefore simply a variation on a more traditional iconographic pattern characterizing the carved celts and some incised ones. Finally, while the source of the excised forms was iconographic, they may well have influenced Mesoamerican writing—or indeed have led to it. Several hieroglyphic signs for verbs were depictions of body parts involved in the performance of the activities referred to by the verb (sitting, running, letting blood, holding/having or grasping something, flinging with a spear thrower, casting grains or droplets).

Compared to the holistic, gestalt type of interpretation to which pictorial representation of a figure or scene is subject, the effect of these practices is to focus attention on particular ideas and events that the segmental elements convey and to compactly convey sequences of events; they admit the representation both of a sequence of ritual activities and of its supernatural and social context. An example is provided by the Humboldt celt (*figure*

te), as we interpret it.¹¹ At the top of the celt, the accoutrements of war and rulership are placed together in the position of the head of an imaginary figure. The figure's braceleted arms are depicted immediately below in a gesture later used as a greeting to a local lord.¹² This is the extent of depiction of this figure, or at least of its first instance. Below the arms is another complex (of uncertain significance, though it has some suggestive analogues in Maya writing), which surmounts an outstretched, braceleted hand and wrist. Whatever its meaning,¹³ it seems very likely to indicate a different event from the gesture of greeting.

In its isolation of discrete event references by discrete groups of graphic elements, this iconographic system appears on the verge of a rudimentary logography like that of Protoliterate Sumerian. It differs in that it probably bore no direct relation to language, and the most proximate elements of the discrete groups are generally related by depictive pictorial relations: the relation of the possible casting hand to the associated objects, and the position of both arms and hands relative to one another in the greeting. However, in these respects it is not so far removed from the earliest hieroglyphic systems that, seemingly, supplanted it; several of the later, written forms sometimes have a pictorially-motivated spatial organization which often renders them interpretable mainly via pictorial, rather than linguistic, convention.

When more than one segmental form is used in an iconographic "statement" on a celt, these forms are intrinsically organized relative to one another in space. Typically, there are two such forms, or groups of forms. In these cases, the organization adopted is essentially anatomical realism, largely interpretable in terms of standard pictorial conventions: forms pertaining to the headdress are placed at the top; next highest is the head; next highest the hands or arms; and next the torso or leg regions. Most of these elements are optional, although when any of them occur at least a head or headdress elements are among them. The organization deviates from that in pictorial representation, in that the segmental forms occur in free space rather than being joined anatomically by overt indications of intermediate portions of the implied figure—the minimum deviation required by the use of segmental forms. They also differ in subtler details. For example, some of the accoutrements signalling status and role appear to have been objects held upright alongside the head; they are grouped above with headdress elements, which were perhaps the archetypical examples of status symbols in Mesoamerica.

An extension of these organizing principles is required when more than one iconographic statement is involved, as on the Humboldt Celt. While the first statement can be recorded in a traditional way, a second gesture performed by the same individual must be placed in relation to the other forms on the celt. The bias in such an extension seems most likely to involve the traditional record of one statement, with the second appended spatially in some way. An anatomically correct placement is impossible in the case of multiple gestural or manual statements; the vertically-elongated orientation both of the celts and of standing anthropomorphic forms biases in favor of its placement below rather than alongside the first statement. Thus, multiple statements produce a vertical columnar sequence of segmental visual forms or form groups in free space; they thereby reinforce the deviations from the pictorial conventions of other genres of Olmec art and produce an organization homologous to the sequence of syntactically clause-level conceptual structures in language.¹⁴

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Accordingly, the principles of celt iconography appear to have provided bases for those of writing. In fact, if some of the segmental iconographic elements below the head on these celts were simply standardized in size or format, they would be readily interpreted as a hieroglyphic text. We suspect that something very much like this did happen as writing emerged from this special iconography, and a fully developed example of the result may be reflected on the El Sitio celt (*figure 1c*): one side presents a headdress, deity mask and lower body in standard precursor format, and the other a single column of text in what appears to be a primitive form of the Isthmian (*epi-Olmec*) tradition.

This hypothesis cannot yet be tested directly. Too few of the inscribed ceremonial celts have been recovered, especially in controlled excavations, to provide adequate documentation for the precursor system itself. There is some indirect support beyond the similarity in representational conventions. If writing was emerging in this way from the system of celt iconography, being in effect merely a later form of that representational system, then it was doing so in the context of whatever functions the celts were serving. Celts and early writing do, in fact, appear to have been used in connection with comparable types of ritual activity relating to the power and prestige of individual political leaders. The columnar format of the earliest scripts would also follow from such an origin, the iconographic format of celt iconography itself being basically columnar.

The only well-developed alternative hypothesis for iconographic origins of Mesoamerican writing is due to Hanns Prem.¹⁵ He argues that the crucial precursor to writing is a system of narrative pictography, a codified iconographic system for recording historical events. Prem assumes that narrative pictography derives from representational art, a development that "is rather hazy and at best is to be recognized in an intensified conventionalization" of iconographic systems that included transparently depictive forms as well as abstract icons. He appears to have in mind the kinds of conventionalized gestures, postures, accoutrements and contexts that are the basis for interpreting the Mixtec manuscripts,¹⁶ and in fact the prototypical examples of narrative pictography are the Mixtec and other manuscript traditions of highland Mexico. Prem concludes that "This tendency of narrative pictography to produce independent conventional signs offers the basis for the development of a true writing system."

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We see little evidence for an Olmec narrative pictography. Sequential information of any sort is rare in Olmec-style art, whose symbolism is far more propositional than narrative. Prem's criterion of intensified conventionalization, applied either to symbolic forms or to their organization, leads to the same conclusion: the few possible narrative sequences in Olmec-style relief sculpture exhibit, if anything, less symbolic conventionalization than do static presentations in the style. In Mesoamerica, at least, it appears rather that narrative pictography emerged from a complex system in which pictorial imagery was associated with increasingly restricted written annotations (see *The Oaxacan Tradition*, below). Writing helped foster the development of a true narrative pictography; it did not develop from one.

In addressing the development of writing from Olmec-style iconography, it is useful to separate the issues of conventionalization of sign forms, independence (our "segmenting") of sign forms and narrative. They relate, according to Prem, in that narrative pictography fostered independent (segmental), conventional symbols that would come to be used in writing; however, it is iconographic conventionalization more than separateness of forms that is most evident in narrative pictography. For us, it is the organization of visual forms that was of primary importance in the evolution of writing from iconography. Functionally, conventionalization of individual visual forms has no necessary, intrinsic relation to their organization; in contrast, independence of forms is, by definition, organizational, and multiclausal state-

ments entail organization, relative to one another, of forms corresponding to the separate clauses. Thus, narrative has a very different role, if any, in our picture of the emergence of writing: chronologically, it is near the end rather than the beginning of the development; functionally, whatever effect it may have had was not by spawning increased conventionalization of gesture, pose, clothing and architectural context but by forcing the extension of representational principles that had originally differed far less substantially from those of representational art.

Though it may have had some limited role, we do not attach much importance to the conventionalization of symbols, at least for the *origin* of Mesoamerican writing from its iconography. According to our scenario, visual forms should have been presentable in an iconographic source for writing in any way that they were presented for the same communicative purposes in iconography; it is not their form but their relation to other segmental visual forms that we take to be crucial for the development of a linguistic interpretive framework for the graphic system. This is exemplified in early Mesoamerican writing by the range of viewing angles and, to some extent, postures of Mayan hand gestures¹⁷ and of both Mayan and Zapotec seating signs (*figure 2*). Concerning the celts in particular, we see no evidence that the visual forms inscribed on the celts are conventionalizations of visual forms in pictorial representations. Rather, what is conventionalized in the celts are the small deviations from the traditional pictorial patterns of organization of visual forms, and these, we claim, are leading to writing via their homology with clause sequences in language.

We also differ with Prem concerning the sources of celt iconography and its relation to writing. He briefly relates celt iconography to narrative pictography in a passage¹⁸ which, if we are interpreting it correctly, expresses doubt concerning a direct relation between the celt iconography and writing. He considers celt iconography to exhibit "a self-sufficiency of form which derives from narrative picture writing." This "self-sufficiency" seems to be equivalent to his earlier "independent conventional signs," a reference to the rendering of just one part of an anthropomorphic figure, such as a gesturing arm, to convey what it would in a full depiction of the figure. This would agree with Proskouriakoff's characterization of San Lorenzo Monument 41 and with our own presentation. We are also agreed that the conventions have their source in Olmec-style art. However, we see no evidence that celt iconography grew out of a specifically

narrative iconographic system. Celts typically carry static presentations, with the rarer narrative pattern seemingly interpretable within the format of the static celt iconography. Prem's further comments on celt iconography seem to emphasize the distinctness of the tradition from that of writing, while allowing that the visual forms involved could have been part of a broader inventory of symbols that were as a whole becoming the signs of a script. In contrast, we take the iconography of incised ritual celts to be the proximate source of writing.

Common Features of Early Mesoamerican Writing

Across its history, Mesoamerican writing appears in diverse guises. The earliest scripts, however, appear rather similar to one another. Since the decipherment of most of these scripts is in a quite rudimentary state, these similarities are discussed initially with respect to the visual organization of these systems. As in other scripts, most texts have several levels of visual organization: component features of signs (not discussed here); signs; complexes of signs; columns or rows of sign complexes; and text segments of columns and/or rows. A persistent relationship between iconography and early writing affected this visual system up to the level of sign complexes: not only were most signs, effectively, pictorial renderings consistent with the local art style, but signs and components of signs were often organized according to iconic principles even when they conflicted with the reading order. In these respects, they recall the organization of ritual celt iconography.

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Iconicity: Sign Form and Sign Value

Many or most signs in most of the scripts are depictively transparent. Easily recognized objects were simply depicted in a characteristic view: for example, pyramids, ball courts, hills, shields, hatchets. Their depictive conventions also appear to continue, and probably to elaborate, those of the precursor iconography. The *pars pro toto* depictive convention not only related sign forms and sign values in references to animate beings that were depicted but also in references to an individual whose name was a word for that being. Not only were events involving manual activity portrayed by hands in an appropriate pose, accompanied by the primary manipulated objects, but also other actions performed by individuals were depicted by presenting the primary parts of the body involved in the performance: for seating in office, a view of the crossed legs and waist in full-profile, half-profile or full-frontal view (*figure 2*); for genital bloodletting, a kneeling torso with blood issuing forth (*figure 3*).¹⁹

FIGURE 2

Mesoamerican signs
for seating in office.

Zapotec:

- a. Monte Alban Stela 12;
- b. Monte Alban Stela 15;
- c. Monte Alban Tablet 14;
- d. Monte Alban Stela 2.

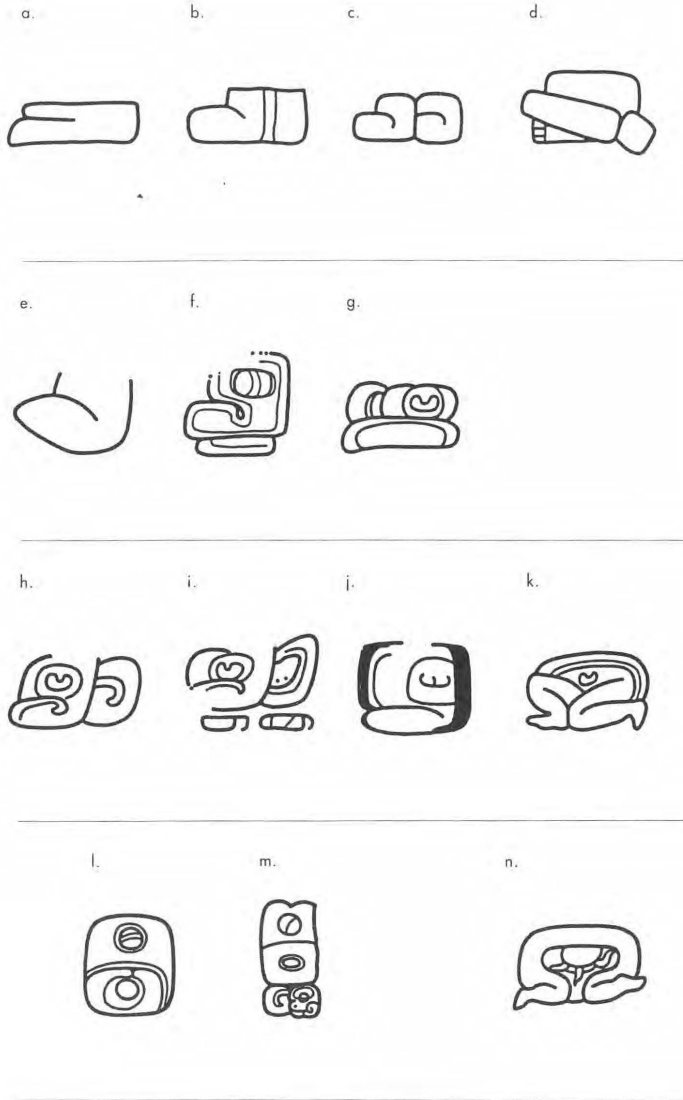
Preclassic Maya-Izapan:

- e. Maya text on a stone pectoral, Dumbarton Oaks.
- f. El Porton Monument 1;
- g. Maya monument of unknown provenance, now in the Seattle Art Museum;

Early Classic Maya:

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- h. Leyden Placque, with **mu** phonetic complement suffixed (for Yucatecan **kum*, Cholan **čum* "to sit");
- i. Leyden Placque, with probable *-lax* grammatical suffix for completive aspect;
- j. Ixteilha cave mural;
- k. Yaxchilan lintel 11;
- l. Tikal Stela 21;
- m. Pomoná Tablet 1;
- n. Palenque Palace Tablet.



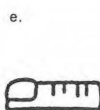


FIGURE 3

Sign complex for male genital bloodletting.

a. Posture of Maya genital bloodletting: iconographic depiction, Huehuetenango vase. *Maya genital bloodletting sign*, depicting a human seated torso in position to perform genital bloodletting, with sign for "stone" in lap possibly for penis; words for stone mean "penis," "testicle(s)," or both in many Mayan languages.

b. Tikal Stela 31;

c. Tikal Stela 12.

La Mojarra Stela 1:

d. sign depicting a human seated torso in position to perform genital bloodletting, with blood issuing forth from the loins; followed immediately by penis sign with two wounds or scars visible on the shaft.

e. Another instance of the scarified penis sign.

f. *Maya penis-and-testicles sign*, Copan Temple 18, with twin wounds or scars.

Iconicity : Sign Organization
and Syntactic Organization

Spatial proximity was used to signal a close interpretive relationship among visual units, in particular syntactic relations among signs. This is most readily demonstrated using calendrical signs, whose syntactic interpretation is clear; usually, they consist of a numeral + noun construction. A numeral often abuts the sign for the noun it modifies, less often other adjacent signs; when they do not abut each other, the numeral and modified sign are typically separated by less space than separates either from any other adjoining sign. Non-numerical compounds, when we recognize them, behave similarly. In the Zapotec script, for example, a year was referred to by adjoining the headdress of a particular deity²⁰ above the sign complex for the ritual calendar day that named that year.²¹ Whether or not this differential spacing was intentional,²² it constitutes a level of visual organization of signs into sign complexes.

This level of sign organization by juxtaposition is often iconically motivated, as exemplified by the lightning god headdress just discussed—it is effectively being “worn” as headdress by the ritual calendar day naming the year. There are many noncalendrical examples, such as the seating sign (*figure 4*). In Preclassic Zapotec texts, the seating sign is often surmounted by a directly adjoining sign; in one case (*figure 4a*), on Monte Alban Stela 15, the surmounting sign is a jaguar head that a parallel text helps secure as the ruler’s name.²³ On (Isthmian) La Mojarra Stela 1 (A.D. 156), a “lord” or “ruler” sign adjoins a platform throne sign immediately below (*figure 4b*), indicating the seating/placement of a named individual as ruler.²⁴ And on (Maya-Izapan) El Porton Monument 1 (c. 450-350 B.C.),²⁵ a seating sign adjoins another sign immediately below it (*figure 4c*), plausibly a seat of some sort;²⁶ these two signs together may indicate seating on the throne, of an individual probably named in the following blocks. In all these cases, the juxtaposition of signs captures an essentially iconic relationship: a jaguar head naming the ruler is placed upon the ruler’s seated body; a head sign for ruler or rulership is upon the throne; the seated body of the ruler is upon a seat.

Another type of visual unit akin to these sign complexes is a more intimate visual union, either of signs (*figure 5c-e*) or of depictive elements that together form a single sign (*figure 5a,b*). In these units, one sign or element is cradled or entwined in another; this is typical of signs depicting hands holding objects, where a finger or thumb may cradle an object, or the hand may wrap around part of an object.

FIGURE 4

Iconic compounds for seating of rulers on thrones.

- a. A lord Jaguar seated, Monte Alban Stela 15 (Zapotec);
- b. lord on his throne, La Mojarra Stela 1 (Isthmian);
- c. seating, possibly on an object, El Porton Monument 1 (Maya-Izapan).

FIGURE 5

Depictive sign complexes.

- a. Hand grasping a rattle or, more likely, a mace; Monte Alban Stela 12 (Zapotec).
- b. Hand grasping a spear-thrower; Tikal Stela 31 (Maya).
- c. Hand holding or grasping an unidentified object; Monte Alban Stela 15 (Zapotec).
- d. “Ahau-in-hand,” conveying the grasping (**b’ak’*) of a scepter of supreme authority; jade plaque, probably from Rio Azul (Maya).
- e. Inverted, formal analogue of d., from La Mojarra Stela 1 (Isthmian).

The iconic organization of sign complexes and complex signs creates semantically coherent groupings of units that normally form well-defined syntactic constituents of a sentence. In the examples above, manipulation of objects normally involves predicates, such as “casts incense” combining a verb and direct object; seatings normally involve subject and intransitive verb; and the year sign with day position defines a named year, whether as a noun phrase or equational predicate. Together with the effects of simple juxtaposition of related units, as in the numeral + day name compounds, this level of sign organization was a level of both visual and syntactic organization of the script.

a.



b.



c.



a.



b.



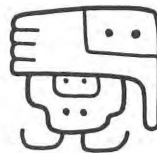
c.



d.



e.



In some cases, however, the sequencing implicit in the iconic organization of signs conflicted with the linear sequence of corresponding units in language, particularly in Zapotec and Mayan but perhaps not in the (probably Mixe-Zoquean) Isthmian texts, because verbs characteristically precede both subjects and objects in Zapotec and Mayan. In iconically motivated sign complexes and complex signs, signs referring to the subject or object of the verb may precede the sign for the verb: objects held in hands are typically above them (*figure 5c-d*); names of persons being seated may be upon the seating verb (*figure 4a*). Headdress elements in Olmec iconography provide a comparable example. Several of these elements end up designating titles or offices in Southeastern scripts, both Isthmian and Mayan, where they continue to be represented in headdress position.²⁷ Reading order in Isthmian is unknown, but in Mayan they are demonstrably read after the units they surmount.²⁸ Such cases suggest conceptual interpretation via iconographic conventions for depictive referents of visual elements and their spatial organization, not a direct rendering into language via linguistic correspondences (sign values). In other cases, sign organization and word order are not in conflict; nouns for locations normally follow verbs in all three language groups, as in the “seating on throne” compounds of figure 4.

In Southeastern writing and perhaps in Zapotec writing as well, spatial organization was used in some contexts to clarify the interpretation of sign groups. In the Southeastern area during the Late Preclassic, numerals were appended on the left of day signs rather than above them if the numeral would otherwise appear to be part of an immediately preceding column of digits in a place value count of days leading to the ritual calendar date.²⁹ Not long thereafter (c. A.D. 100-400) in the Zapotec area, numerals were also appended alongside (typically left of), rather than below, associated signs,³⁰ as on Monte Alban Stela 1. Names of ritual calendar days sometimes serve calendrically as dates, but often they were used as personal names or as names for years, both common practices in most of Mesoamerica. Numerals are appended alongside the deity headdress associated with names for years and alongside day names that appear to function as personal names, but we are not confident that any case refers to a date. Since this orthographic practice is not found with day names clearly used as dates, we suspect that these numeral + noun compounds are for personal and year-names; if so, they would conflict with Zapotec word order, and constitute an orthographic convention aiding semantic interpretation. A few might be simple numeral + noun constructions, in which numerals precede

nouns in Zapotec, as is usual in Mesoamerican languages.

Reading Order

In all the earliest scripts, text is organized into columns of signs or sign complexes. Apparent instances of row format are rare, almost always consist of a single row (which is also, of course, a series of columns, each of which contains only one sign complex), and are virtually restricted to rims and borders. A deviation developed in the Maya-Izapan group: in segments of text with multiple columns, columns were read in pairs.³¹ Columns are read from top to bottom: in text regions with multiple, contiguous columns, the tops of columns always align at least as closely as the bottoms, and often the tops align neatly while the bottoms are ragged. Within contiguous sections of text, reading is normally from left to right: this can be demonstrated by sign sequences that occur both within a single column and split across columns, the first half reaching the bottom of one column and the second half starting at the top of the adjacent column on the right.³² Rare cases of right to left order are motivated by very limited compositional circumstances, discussed below.

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On monuments presenting both scene and text, several segments of text may be spatially separate, the placement of these segments typically adapted to open space left by the scene. For example, many monuments are organized visually around a central figure or iconographic motif; signs may be grouped in short columns alongside or axially, and text segments placed variously with respect to the figure may be read starting with segments to the right, to the left or in the center. Elaborations of these formats in iconographic context appear to be the basis for a greater variety of later visual formats for sign sequences.

In early Mesoamerican scripts, signs depicting figures or heads in profile face in the direction from which one reads, a practice also characteristic of ancient writing in the Old World. Throughout the history of these scripts, reversal of reading order is accompanied by a reversal in the orientation of signs, again a typical practice worldwide. Such reversals are adopted for compositional reasons. Except in the case of screenfold manuscripts, they almost always involve exactly two text segments facing one another, usually in a central position architecturally (e.g., around a doorway) and usually accompanying a figure facing left or right; a reversed segment faces either with an accompanying figure placed above or below it, or toward an accompanying figure placed alongside it. Similar conditions typify Egyptian

text segment reversal. The practice is rare in Mesoamerican monumental inscriptions, the prime example in the Preclassic being La Mojarra Stela 1. Probably beginning in the Late Classic period, screenfold books in the Oaxacan tradition used a boustrophedon pattern in narrative pictography; by this time, however, sign complexes were limited to one-word captions to portions of iconography and have no sequential textual organization.

Common Origin of Mesoamerican Writing

While these visual features may be inherited from a system ancestral to the Oaxacan and Southeastern scripts, they do not constitute evidence for the existence of such an ancestor. Single-column format, top-to-bottom order within columns, left-to-right order of the columns themselves and profile head signs facing in the direction from which they are read, all are typical of the earliest Old World scripts; universal patterns are not criteria for genetic relationship. Some kinds of content are also typical of royal inscriptions elsewhere: chiefly, the ruler's genealogical justification for rulership; key historical events leading up to his rule, including birth, marriage, and accession; propagandistic boasts concerning warfare, raiding and human sacrifice; and celebrations of regular, scheduled rituals by the political elite. Finally, most signs evidently shared among different script traditions are transparently depictive, and their depictive norms relate to the representational art of their respective cultures. They may, therefore, reflect shared content rather than a common script tradition. For example, a footprint or series of footprints is used to indicate travel or a path in highland Mexican iconography, on an Olmec monument from La Venta and in Maya iconography and hieroglyphic writing (where it also had the phonetic readings *be* and *bi*, based on a descendant of proto-Mayan **b'e:h* "road, path").

Other shared features are specifically Mesoamerican. A few signs involve what appear to be conventionalized or depictively arbitrary features providing evidence of relationship. A prime example is the use of bar-and-dot numerals, a bar conveying 5, a dot conveying 1, with numbers from 1 to 19 formed additively by a horizontal stack of bars surmounted by 0 to 4 dots. Another widely attested feature is the use of a cartouche surrounding most day signs, when they function as such. A rectangular field was frequently infixed at the wrist in signs depicting hands, a feature with no known depictive basis. Some shared content, including the recording of days in the ritual calendar and of certain rituals, is also specific to Mesoamerica; while these could arise from cultural interaction rather than being an inherited practice, they do typify the precursor system and, thus, suggest common

descent, whether or not through the intermediacy of an ancestral script.

The historical interpretation of these Mesoamerican elements is not yet clear. The sharing of many can be explained as a common inheritance from the precursor system as readily as from a common writing system. The iconic aspects of the visual organization of Preclassic writing—the iconic organization of depictive elements with respect to one another and to depictively abstract signs—look very much like the conventions of the precursor iconography. The isolation of heads to represent individuals, of hands to represent manual activities, and of headdresses and headbands to represent statuses or offices, are all attested in early writing as well as in Olmec-style celt iconography. Bar-and-dot numeration may go back to the precursor system; Michael Coe suggests it is much older than writing,³³ and it does seem to be attested in Olmec-style iconography outside of the celts.³⁴ Indeed, it may be the juxtaposition of these numerals with depictions of the referents of day names that led to the emergence of writing from a pre-existing graphic system not aligned with language.³⁵ A few signs in Zapotec and Southeastern writing seem to go back to the precursor system as well: the deity headdress becomes the Zapotec year sign, evolving into the year signs and lightning god headdresses of both the Mixtec and Aztec; and headdress elements of rulers show up in Isthmian texts for statuses or offices. Since precursor iconography was part of a shared ceremonial complex, it could have given rise to different scripts separately in different areas, or it could have evolved into writing as part of the ceremonial complex.

There are some indications that a common Mesoamerican script did emerge from the shared precursor iconography since a very few features shared by the scripts do not show up in Olmec-style art. The clearest indicators are the cartouches around day signs and the field infix at the wrist of hand signs. Less definite evidence comes from the representation of seating in office, using disembodied, cross-legged, seated haunches; the body-part convention was rarely applied to the lower body in surviving examples of precursor iconography, and the theme of inauguration in office is not yet known from that iconography (it is treated in the more usual variants of the Olmec style). And since the precursor system is part of a ceremonial complex thought to be shared throughout Preclassic Mesoamerica, and since the function of the earliest surviving texts is political, it makes sense to see writing as simply a variant form of precursor iconography emerging in the context of political use of that iconography in ritual. However, the evidence for an

ancestral script is too sparse to preclude the possibility that two regionally distinct hieroglyphic systems emerged and developed separately from precursor iconography.

There is in fact some reason for suspecting that separate scripts emerged from the precursor system, the iconography of ritual celts. Although we suggest above that writing effectively replaced this precursor system, the two co-existed at c. 600-500 B.C. Writing is found on at least one monument from La Venta, and precursor iconography apparently survived at that site until its fall (c. 600-500 B.C.³⁶) since one example was placed in an offering during its last construction phase. The ceremonial complex, of which the precursor to writing was a part, is unknown outside the Olmec region after this time. Writing existed in both the Olmec and Zapotec areas by 500 B.C., in clearly distinct written traditions by 400 B.C. This timing for the emergence of writing is rather suspicious: it appears to be associated with the fall of the shared ceremonial complex and its iconography, and with development of several autonomous incipient states. The changing nature of political ritual in these last days of the shared ceremonial complex may have been related to the changing nature of the symbol system used in association with it. If so, writing as a variant form of precursor iconography was supplanting the classical form of that iconography, and doing so in the context of a replacement of the shared ceremonial complex by autonomous regional developments. This points to the emergence of separate hieroglyphic systems from the precursor via the process of state formation, as regionally distinctive developments from a decreasingly shared iconography no longer restricted to ritual celts.

The Emergence of Regional Traditions

By c. 500 B.C., writing evidently existed throughout southern Mesoamerica at sites that had participated in the Formative ceremonial complex. One badly weathered text, tentatively dated to the period c. 700-500 B.C., has been found at Chalcatzingo,³⁷ a highland Mexican site with Olmec-style monuments. A possible day name is recorded in association with the depiction of a sacrificial victim from San Jose Mogote, a regional center in the Valley of Oaxaca,³⁸ by 700-500 B.C., and a genuine text tradition was in place by c. 400 B.C. at Monte Alban, the capital of the newly founded Zapotec state. An undeciphered columnar text (c. 600 B.C.) is found on Monument 13 from La Venta, a major center of Olmec civilization; dated texts in the descendant Southeastern tradition begin c. 50 B.C. Another textual monument was erected c. 450-350 B.C. at El Porton, a site in the northern Guatemala highlands that did not participate in the Formative

ceremonial complex: some of its hieroglyphs relate stylistically to the iconography of the southern Guatemala highlands and Pacific coast,³⁹ a region that had participated in the ceremonial complex.

Several diagnostic traits allow the attested examples of writing to be separated pretty clearly into two distinct script traditions.⁴⁰ One is part of the Valley of Oaxaca tradition first attested on the monument from San Jose Mogote; in origin it was probably a Zapotec system, but it later came to be used by Mixtec and then Nahuatl speakers, among others. The other is an essentially Olmec tradition, the Southeastern Mesoamerican. It continued with no obvious change into the Isthmian regional tradition,⁴¹ whose geographic distribution correlates closely with that of Zoquean languages.⁴² Maya-Izapan writing, probably an offshoot of the Southeastern tradition, developed a unique pattern of visual organization and was the only script tradition in Mesoamerica from which a substantial corpus survives.

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THE OAXACAN TRADITION

The Zapotec region provides the fullest corpus of texts from the Middle and Late Preclassic periods. The identification of its texts with Zapotec specifically was long suspected and is now generally accepted; the best hieroglyphic evidence is the suffixing of numerals to names of ritual calendar days,⁴³ an exotic feature in Mesoamerican languages, and it is also suggested by the evidence for linguistic continuity in the region. While there have been attempts to demonstrate an association between signs in the script and particular Zapotec words,⁴⁴ the evidence is not compelling.⁴⁵ Extremely terse records in the same script are found in the Mixtec highlands during the era 200 B.C. - A.D. 100.⁴⁶ The script was apparently introduced into the Mixtec lowlands (the Nuiñe region) by the same era although surviving texts are from the succeeding archaeological phase (A.D. 100-400).⁴⁷ Nahuatl writing is probably also its descendant, being quite similar to Mixtec manuscript writing in its restriction of content to proper names (place names, personal names and day names), in the conventions used to represent them and in the signs used to represent day names.

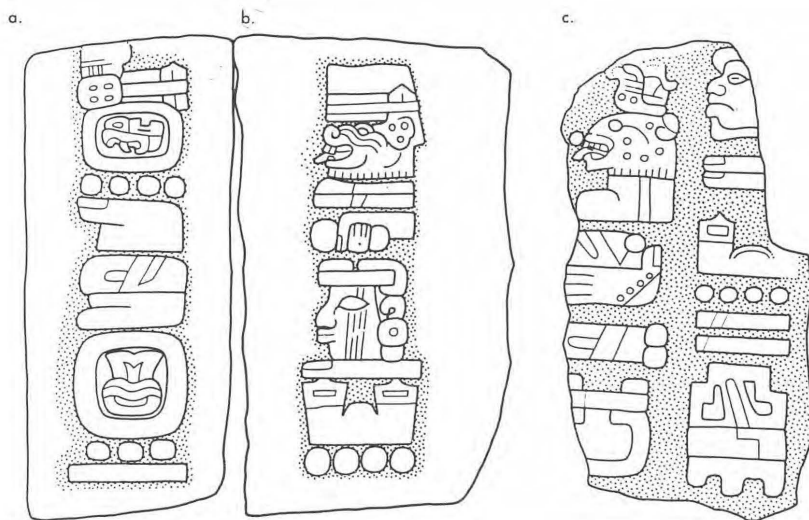
The representational principles of the Zapotec script have not been investigated explicitly. Decipherment research has generally proceeded on logographic assumptions. The possibility that Zapotec writing was partly phonetic was raised very early by Caso;⁴⁸ he eventually came to believe that Zapotec place-name spellings were probably in part phonetic⁴⁹ though as yet there is not direct, internal evidence for this.⁵⁰ Whittaker states expli-

citly though without supporting argumentation, that the system was logographic.⁵¹ It can be demonstrated, at least, that the script was largely logographic, and, like Whittaker, we believe its principles were comparable to those of pre-Sargonic Sumerian writing.

The key to this demonstration, as to almost all decipherment work in Mesoamerican scripts, is provided by calendrical records. Days in the ritual calendar are almost always followed by a numeral in bar-and-dot notation; this reflects the structure of calendrical names, a juxtaposition of a word for a numeral between 1 and 13 with one of twenty day names. The ritual calendar record is often followed immediately by the so-called "Glyph W," a sign followed by a numeral between 1 and 18; formerly thought to represent a month name,⁵² Glyph W appears to record a count, or a station in a count, of an as yet undetermined time period.⁵³

Using ritual calendar records, Glyph W and the year names, often only one sign intervenes between successive calendrical statements. For example, on Monte Alban Stela 13 (*figure 6b*) is a column of four compounds: a year bearer, a sign depicting a hand grasping a mace or rattle, a ritual day position and four Glyph W time units. The hand sign is evidently logographic, quite possibly for a verb concerning an event such as warfare or

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sacrifice. Other signs, depictively transparent, have logographic analogues in other Mesoamerican scripts whose meanings are contextually appropriate; the best example is the seating sign discussed above (figures 2, 4 and 6a, c, e), associated with accession to supreme power. The logographic nature of some signs can be established by contextual analysis; for example, the seating sign is usually closely followed by a sign depicting a tied pouch or bundle⁵⁴ (figure 6c, e), bundles being associated with accession both glyphically and iconographically among the Maya,⁵⁵ and glyphically in the Isthmian script (see below).

This leaves relatively few sign groups for possible interpretation as partially phonetic spellings, and there is no evidence for a subset of signs from which the members of these residues are drawn, i.e., for a syllabary used in purely phonetic spellings. Indeed, there were probably no simple phonetic signs of this sort. Proto-Zapotec roots were mostly of two syllables, each consisting of a single consonant followed by a vowel (CV),⁵⁶ so it would be difficult for rebus phoneticism to take root.⁵⁷ Thus far, there is no evidence of even this sort of phonetic representation for a Zapotec sign, but such usage did eventually develop in Mixtec writing, an offshoot of the Zapotec tradition.

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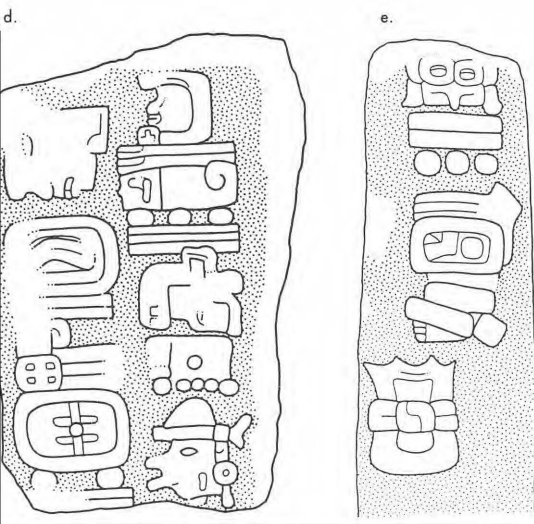


FIGURE 6

*Early Zapotec texts
from Monte Alban.*

- a. Stela 12;
- b. Stela 13;
- c. Stela 15;
- d. Stela 17;
- e. Stela 2, left side.

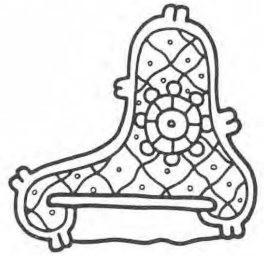
The Mixtec manuscripts use a logographic system of representation for personal and place names.⁵⁸ Rebus is extensively used in the Mixtec place names, as well as in the Aztec system, which evidently descends from the same tradition (figure 7). The most common Mixtec use of rebus is to provide a phonetic cue (i.e., a phonetic complement—M.E. Smith’s “phonetic indicators”) to the interpretation of a morpheme represented in a depictively transparent way (M.E. Smith’s “primary signs”); see figure 7b. In addition, rebus is sometimes used as the sole sign representing the morpheme (Smith’s “phonetic transfer”); see figure 7c, f. At least in later, Aztec inscriptions, the two were combined, with rebus complements to rebus logograms; see figure 7e.

The Zapotec place signs are constructed similarly to the Mixtec, and seem to be the historical source of the Mixtec system of place name representation; this is in fact how their function was recognized.⁵⁹ However, all the signs in the Zapotec place name compounds appear to function logographically or iconographically, and are so interpreted by both Marcus and Whittaker. Few contain enough signs for any to serve as a secondary indicator. This contrast adds to the evidence for strict logographic representation without rebus in the early Zapotec texts. Nonetheless, rebus representation, as simple logograms or as phonetic complements to other logograms, could easily exist in the uninterpreted portion of the Zapotec corpus.

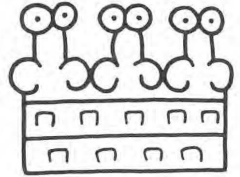
In Sumerian, Egyptian, Chinese and Mayan hieroglyphic writing, rebus is repeatedly the prime basis for the development of non-logographic phonetic values for signs that were originally logographs. In Egyptian, this is reflected in the orthographic principles of phonetic representation. Different inflected forms of roots can be produced by varying the root vowel so that before grammatical variations were represented, the same sign represented forms differing phonologically in the vowel associated with the root. The phonological principles of the script were indeed based on consonants only. Similarly, tonal variation served inflectional purposes in Mixtec, and tonal variation was legitimate in Mixtec rebuses.⁶⁰

The Zapotec hieroglyphic system shows substantial evolution in its visual organization. The conquest tablets of Mound J at Monte Alban (200 B.C.-A.D. 100) present an iconographic representation of the conquest of a named place during a named year, with a glyphic text proceeding from this central design.⁶¹ This pattern is close to that of the Olmec-style precursor iconography from which, we have argued, Mesoamerican writing derives, but it is not the only attested pattern. Simple day name captions accompany depictions of cap-

a.



d.



b.



c.



e.



f.

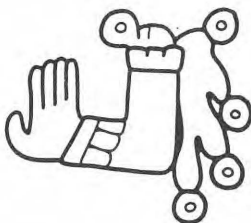


FIGURE 7

Rebus representation in Mixtec and Aztec place names.

Mixtec spellings:

a. Depictively transparent pictorial/logographic representation of *Yucu Yusi* "Hill of the Turquoise Jewel," by a depictive sign for "hill" with a depictive sign for "turquoise jewel" at its center; Codex Sanchez Solis.

b. A depiction of a cradle (Mixtec *dzoco* "cradle"), added to a depiction of water welling up, secures the reading of the latter as Mixtec *dzoco* "spring"; Lienzo de Jicayan.

c. A depiction of a bundle of feathers (Mixtec *yodzo* "large feather") represents the word *yodzo* "plain"; Codex Bodley.

Aztec spellings, all from the Tizoc Stone:

d. *Šoči-mil-ko*, "Place of Flower Gardens," depicting flowers growing in a field; -ko is a locative suffix.

e. *Akol-man* or *Akol-wakan*, "Place Pertaining to the Leader" or "Place of the Acolhua," with an arm *akol-* for the root, and *a-* "water" as complement.

f. *Čal-ko*, probably for "Place of the Chalca (people)" or "Place of the Hollow," depicting a disk of green stone *čal=čiw-*.

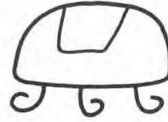
a.



b.



c.



d.



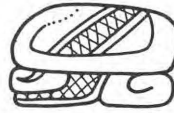
e.



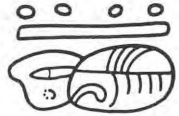
f.



g.



h.



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tives, rarely as part of a lengthier text. Texts consisting of more than a few signs are typically organized into columnar format, but shorter texts often are not.

The same variety of formats characterizes the script during the period beginning c. A.D.100-400, except that examples involving both scene and text tend to be much more crowded, with small text segments crowded into small spaces of the scene rather than being presented alongside a scene in free space.

A number of tablets attributed to the region of Zaachila⁶² begin to become important after A.D. 100, during and after the era of Teotihuacan influence, and their general iconographic conception may have been influenced by the art of that Mexican center. However, the iconographic content of these monuments is obviously close to those of the individual registers of the Mixtec screenfold books.⁶³ Glyphically, they are sometimes much more elaborate than the later manuscripts, with many more names and/or dates than a single manuscript register; this is correlated with the use of text for narrative that in later manuscripts would be made more explicit in iconographic depictions of the activities taking place on the dates mentioned or of the named people conducting them. Genuine texts in this period are relatively fewer, limited to standing shaft stelae, and consist mainly of dates. This period, then, probably sees the beginnings of the tradition of a complex narrative iconographic tradition on screenfold books,⁶⁴ accompanied by simple captions giving day names (of people or days) and place names. The latter had been iconically rather more than linguistically organized

FIGURE 8

Relationships between Maya and Isthmian signs.

Examples a-d are Isthmian signs, e-h their Maya correlates.

- a. Knotted cloth sign, for accession to office, La Mojarra Stela 1;
 b. "Ahau-in-hand" sign, La Mojarra Stela 1, with two dots in the "mouth" of the "Ahau" element held in the hand, and in the rectangular field infixed in the hand;
 c. so-called "initial sign," with characteristic 3-hooked suffix, El Sitio celt;
 d. evidently, a count of 13 days, **13**-"hill-obsidian", La Mojarra Stela 1;
 e. knotted cloth sign, for accession to office, Piedras Negras Lintel 2;
 f. "Ahau-in-hand" sign, "grasp a scepter," jade pectoral bead from Cenote of Sacrifice, Chichen Itza, with a U-shaped element in the "mouth" of the "Ahau" element held in the hand, and in the rectangular field infixed in the hand;
 g. "initial sign," with characteristic 3-hooked suffix, Balakbal Stela 5;
 h. a count of 9 days, **9-la-ta₂**, jade plaque probably from Rio Azul; **ta₂** probably depicts an obsidian core (Cholan and Yucatecan Mayan **ta:h* 'obsidian').

from earliest times; they remained so forever, except that rebus phoneticism and some phonetic complementation was introduced at least by the time of the screenfold books. Finally, it should be pointed out that this period evidently saw the birth of the tradition of narrative pictography of which the Mixtec manuscripts are the quintessential example. That tradition emerged as the confluence of iconographic and textual traditions, its existence depending upon the earlier glyphic historical narrative tradition. True narrative pictography was an outcome of Mesoamerican writing, not its source as Prem had suggested.⁶⁵

In some respects, our record of the Zapotec script seems to reflect the political fortunes of its users. San Jose Mogote Monument 3 was dated by its excavators to the period c. 700-500 B.C.,⁶⁶ which would make it the earliest inscribed monument from the region and perhaps in all Mesoamerica. Its signs differ stylistically from those of the next earliest Zapotec texts (c. 400 B.C.-A.D. 100) while agreeing with later forms (c. A.D. 100-900).⁶⁷ However, the monument's early date is quite secure as it was recovered from a sealed stratigraphic context.⁶⁸ The absence of its features from the earliest royal inscriptions, together with their later reintroduction, suggests their use throughout the period in families or communities that were not in the ascendancy at the time of the founding of the Zapotec state.

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THE SOUTHEASTERN TRADITION

Southeastern Mesoamerican writing has two major branches, Isthmian and Maya-Izapan.

Isthmian (Epi-Olmec)

Isthmian writing is probably the direct descendant of the Olmec script attested on La Venta Monument 13. The system continued to Early Classic times in the Olmec heartland, and in its southerly extension into the Chiapas highlands.⁶⁹ The single most important monument of this tradition is the recently discovered La Mojarra Stela 1;⁷⁰ with about 520 signs, it is the longest non-Maya text in Mesoamerica.

Several features providing evidence for a special historical relation between the Isthmian script and Maya-Izapan writing have been discussed elsewhere;⁷¹ the La Mojarra text provides additional signs that relate directly to Maya-Izapan signs and provide evidence for historical retention⁷² (figure 8). For example, a tied knot sign is associated with accession to royal power, the actual meaning of an identical sign in Mayan

writing. It is compounded with what appears to be a glyphic title and with what may be an accession bundle, and it is prefixed to a name of the ruler beginning with the occasion of his accession (marked by the “lord on his throne” compound, figure 4b). The accession bundle theme was quite differently executed in the tied pouch sign of early Zapotec inscriptions, also relating to bundles containing accession ritual paraphernalia; this difference reflects the closer historic relationship of Isthmian and Maya-Izapan to each other than of either to Zapotec writing. Even more indicative are several signs, on the La Mojarra stela, with rectangular infixed fields in which two punctations are infixed; these signs regularly correspond to early Maya signs of similar form, with corresponding infixed fields in which a single small circle or (in early times) U-shaped element is infixed. In securing historical relationship, this regular graphic correspondence among visually arbitrary elements is analogous to regular sound correspondences.⁷³ Finally, several signs or compounds having no obvious Zapotec parallel suggest a special relation of Isthmian with Maya-Izapan writing; some are discussed in this section on Maya-Izapan writing, below.

Little can be said with assurance about the relation of Isthmian writing with language since the decipherment of the script is in its infancy. Most signs with reasonably clear Mayan parallels are depictively transparent, probably logograms for words whose referents they depict; and most of the signs in Isthmian texts appear to be logographic. However, Zoquean word structure⁷⁴ would not inhibit the development of phonetic or grammatical signs⁷⁵ and a few very frequent signs do appear to render grammatical particles or affixes, whether by rebus logograms or syllabic signs. A very substantial minority of Isthmian signs could well be syllabic or grammatical.

Maya-Izapan

The Izapan side of the Maya-Izapan subgroup is very poorly represented, a handful of Late Preclassic monuments providing the entire corpus. There is nothing distinctly non-Maya about these texts; they are classed as Izapan based on their geographic distribution and, in some cases, a somewhat “primitive” appearance of their signs relative to that of Terminal Preclassic Maya signs.

Accordingly, an ancestral Maya-Izapan script could be ancestral to separate Maya and Izapan traditions, or all of the texts of this tradition could be considered forms of a single script tradition. In the Maya lowlands at least, this tradition was linguistically associated with speakers of Cholan and Yucatecan Mayan languages; elsewhere, it may have been used for a Mayan language

a.



c.



e.



g.



b.



d.



f.

**FIGURE 9**

El Porton seating sign comparisons.

- a. El Porton Monument 1;
 b. Yaxchilan Lintel 11;
 c. Tikal Stela 21;
 d,e. Leyden Placque;
 f. Ixtelha cave;
 g. Monte Alban Stela 15.
 (Examples from figure 2.)

ancestral to Cholan, for a Mixe-Zoquean language, or for both.⁷⁶ Distinctive, shared-features of the Maya-Izapan and Isthmian scripts suggest that these scripts descend from an ancestral Southeastern writing system which, in all likelihood, relates to the Olmec heartland region and, thus most likely, to Zoquean speech.

Whether directly from this ancestral script, from a Maya-Izapan intermediate ancestor or by diffusion from Isthmian, a very few Maya signs have plausible interpretations in terms of Mixe-Zoquean logographic values, yielding discordant phonetic and logographic values in Mayan usage; the single most likely candidate is a sign read *ma* or “great,” based perhaps on Mixe-Zoque **mAb*.⁷⁷ Additional evidence of this sort comes from two Mayan hieroglyphic compounds whose structure has thus far resisted satisfactory interpretation, the so-called “initial sign” of pottery texts (*figure 8c, g*) and the *la-ta*, compound for counts of days (*figure 8d, b*).⁷⁸ These compounds seem to occur in the Isthmian tradition, and their functional contexts in Mayan and Isthmian writing appear to be the same. A Mixe-Zoque linguistic basis for these spellings would account for the fact that they do not seem appropriately interpretable in Mayan.

El Porton Monument 1 (450-350 B.C.) is the earliest monument that may derive from this tradition. A Maya-Izapan attribution is consistent with its location in the northern Guatemalan highlands, between the Greater Izapan region to the south and the Maya lowlands to the north, but we base this attribution on the infixing of a small, vertically banded oval on the torso of the seating sign of its accession record (*figure 9a*). An oval infix is a non-depictive feature found only in Maya examples of the seating sign, and the oval almost always contains either a curving vertical band (*figure 9b, c*) or a U-shaped element (*figure 9d,e*).⁷⁹ In Zapotec texts, a vertical band appears in what seems a directly depictive fashion (*figure 9g*), possibly for a loincloth strap, but not in the conventionalized, nondepictive fashion of the Maya and El Porton infix. Since no seating sign seems to appear in the small corpus of Isthmian texts, we cannot know whether the infix was specific to the Maya-Izapan subgroup or to the Southeastern group as a whole. If the latter, it was executed according to local stylistic norms, as the two profile face signs in the text are specific to the Maya-Izapan art style.

A series of texts from Kaminaljuyu are dated to c. 50 B.C.-A.D. 50,⁸⁰ as are other texts in both

the Maya-Izapan and Isthmian traditions. It is with these monuments that we first find evidence of double-column format in the Maya-Izapan tradition, and this format is always found in this tradition when a single text segment spans multiple columns. As in the Isthmian tradition, signs form complexes arrayed in these columns chiefly by vertical juxtaposition and by iconic relations. Rarely, some signs are infixed within other signs, or are rotated ninety degrees and affixed on the left. By c. A.D. 200, this practice had become pervasive in Maya texts (*figure 10*): sign complexes formed roughly rectangular blocks organized around a central sign (usually a so-called “main sign,” of approximately equal length and width) with elongated signs (so-called “affixes”) appended around it, lying horizontally above or below or standing vertically to the left or right; and such complexes could themselves serve as central cores around which further signs could be affixed. A comparable non-linear organization developed within Chinese writing for the structure of characters and in Egyptian hieroglyphic spellings of words.

Mayan Developmental Trends

For several reasons, Mayan hieroglyphic writing is unusually useful for studying early script development. Most of the early Maya records are on dated monuments. Although no doubt a biased sample of the full range of written records, most of these texts are precisely dated so that we can monitor script development in an unambiguous, absolute chronology. Important developments occur during the period of the dated monuments; these changes can be monitored while they were in progress, so the factors affecting them can be investigated. Finally, the nature of the spoken language corresponding to the written is known from evidence independent of the script, via historical reconstruction; there are twenty-five to thirty Mayan languages from which to reconstruct various stages of Mayan language history, nine of them ancestral to the two or three recognizable varieties written in hieroglyphs.

Phoneticism

The Mayan language family is very well studied, and the main lines of its development are known. We therefore have a good idea not only of the features that appear to be of most importance for understanding the evolution of the correspondence between language and writing—word structure, morphophonemics and phonology—but also of syntactic features that may have influenced these developments. Mayan spelling conventions can be understood for the most part in terms of interactions between these aspects of Mayan language structure and conventions for

a.



b.



c.



d.



rebus representation, neglecting phonological differences among inflected forms; for example, vowel length and postvocalic *b* were inflectional infixes and their presence was disregarded in phonetic spellings. The postulated processes of development are not addressed here as they are more complex than those from the Oaxacan tradition, discussed above, but the logic of development is similar.⁸¹

Most of the earliest phonetic spellings appear to involve phonetic complementation, i.e., a word is spelled by a logogram, but another sign is prefixed or suffixed to it to indicate part of its pronunciation. As in the Old World, the earliest phonetic complements were used mainly to resolve ambiguities in the interpretation of logograms or to indicate grammatical suffixes. The phonetic contexts of the syllabic sign *ni* are illustrative (figure 11). The two or three earliest spellings of the month name #*cikin*⁸² (Yucatec Xul) use only the logogram (figure 11a), which represented other words in other contexts. The sign *ni* (also used for *-in*) was evidently introduced for spellings of the month name sometime between A.D. 415 and 603 (figure 11 b); effectively rendering the apparent suffix *-in* of *cikin*, this determines the appropriate interpretation of the logogram. It was also during this period, beginning c. A.D. 455, that the *ni* sign began to be suffixed to a highly ambiguous logogram when it represented the word *tu:n* ("year [ending]," figure 11c, d) to indicate that reading (*-in* and *-un* are grammatical alternatives showing dissimilation with respect to root vowels). Only after this development did the sign come to be used as a suffix to the unambiguous logogram K'IN, which represented only the word *k'i:n* for "sun, day."

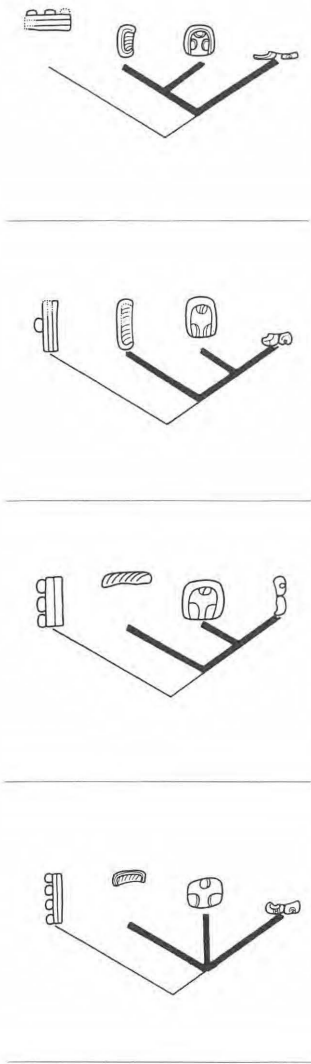


FIGURE 10

Organization of signs in spellings of the month name *kasew*.

In all cases, the compound consists of a numeral followed by the signs *ka*, *se*, and *wa*, in that order; visual organizations are represented by tree structure diagrams. In all cases, the numeral is prefixed to a sub-block consisting of the three signs spelling the month name. In a. and b., the orientation of the signs in the month name are the same: *ka* is in vertical orientation, *wa* horizontal. However, their organization into intermediate levels of sign complex differ: in a., *ka* and *se* form a single graphic unit to which *wa* is suffixed; in b., *se* and *wa* form a single graphic unit, to which *ka* is prefixed. The structure of c. agrees with that of b., but the orientations of signs differ: *ka* is now horizontal, while *wa* is vertical. In d., the structure is different from all the above, with the three signs having no distinctive structural subgrouping, and *ka* and *wa* are both horizontal; a case with *ka* and *wa* both vertical would have the same structural organization.

- Copan Hieroglyphic Stairway;
- Altar de Sacrificios Sculptured Stone 1;
- Tortuguero wooden box;
- Tortuguero Monument 6.

Extensions of orthographic practices are often promoted by similar practices in similar contexts. For example (*figure 12*), adjacent glyph blocks stated the number of twenty-day periods and the number of one-day periods in records of the 360-day civil calendar (i.e., in “Initial Series” dates). The twenty-day period, the *wink-il* or *winal* (derived from **winik*-“man, person”), was usually spelled by a single logogram (*figure 12a*), but it was fairly common in the Early Classic to postpose a sign for the grammatical suffix *-il* or *-al* (*figure 12b*). The earliest cases of suffixing the redundant phonetic complement **ni** to the logogram **K’IN** occur in these calendrical statements immediately following a **WINIK-VL** spelling (*figure 12c*). Accordingly, the practice of suffixing an optional grammatical/phonetic complement in the spelling for one time-period word was being extended to that for the following word, for “day.” This extension resulted in a visual parallel between the structures of the adjacent glyph blocks, in which respect they repeated the parallel between the suffixation on the preceding two time-period compounds. Since **ni** represented a grammatical suffix *-in* in the month name *eikin*, the extension was of the use of a grammatical suffix sign (though not serving in this case as a grammatical suffix) in the environment of the use of another, that for the *-Vl* suffix of *win(k)-Vl*. This structural/grammatical context seems to have been the prime basis for the spread of the **K’IN-(ni)** spelling pattern, and it set up a correlation between the use of the **ni** suffix to the sign for *k’i:n* and the use of a sign for the *-Vl* suffix on the logogram for the twenty-day period; it may also have been promoted by the use of the **ni** suffix on the *tikin* month name and on the *tu:n*-ending compound. The use of the sign **ni** as a phonetic complement to **K’IN** steadily increased over the next three centuries.

The extension of novel spelling patterns like phonetic complementation follows a pattern that can be verified in the internal developments of other writing systems: the analogical extension of representational practices was most successful in the least frequent contexts and in contexts most similar to the sources of the pattern being extended.⁸³ This pattern characterizes both the replacement of logographic by syllabic spellings, and purely logographic spellings by logographic spellings with phonetic complementation.⁸⁴

Several words are common enough to permit a demonstration that phonetic complementation exhibits this pattern, and one of them is *k’i:n*. The context most similar to its use in civil calendar dates is its use for the same word, *k’i:n*, in other contexts, and the most frequent recurrent context of this sort is in the month name

a.



b.



c.



d.



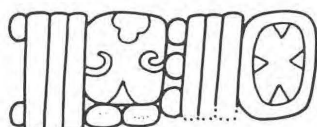
FIGURE 11

Early uses of the sign **ni**. #*aikin*:
 a. unprovenanced monument in Seattle Art Museum, A.D. 199;
 b. Caracol Stela 3, A.D. 603. *tu:n*:
 c. Stone bowl, with Kaminaljuyu-style iconography;
 c. 50 B.C.–A.D. 50;
 d. looted monument pertaining to Bonampak, c. A.D. 497.

a.



b.



c.



FIGURE 12

Patterns of suffixation on adjacent **winal** and **k'i:n** signs.

- a. No suffix on either, Tikal Stela 31, A.D. 445;
- b. suffix on **winal**, not **k'i:n**, Balakbal Stela 5, A.D. 425;
- c. suffixes on both, Caracol Stela 1, A.D. 514.

**ya*^s *k'i:n* (Yaxkin). The spread of the K'IN-(ni) spelling in the month name does indeed appear to have been based on that in civil calendar context. Cases of Yaxkin retaining the old spelling K'IN are concentrated in texts that lack a spelling of the word *k'i:n* in civil calendar context. In fact, texts with spellings of *k'i:n* in both the civil calendar count and in the month name almost invariably spell both the same, and the civil calendar spelling of the word *k'i:n* in these texts precedes (and can thus provide a model for) the month name spelling. The rate of spelling of K'IN-(ni) in the month name lags behind that in civil calendar context until c. A.D. 672, after which the rates are indistinguishable.

The Visual System

The visual and linguistic organization of Mayan writing co-evolved in ways that are in part straightforward and readily recoverable. The interaction producing these correlations is discussed elsewhere.⁸⁵ Here we concentrate on the results of that interaction, in particular on visual regularities in the system of sign values with respect to sign form, and on the visual organization of signs with respect to the syntactic organization of the corresponding linguistic units.

Sign form, and in particular the iconic transparency of signs, played a continuing role in the evolution of the script. Iconically, transparent mainsigns in general have a lower rate of phonetic complementation than other logograms, especially those signs depicting persons or deities (which are usually profile face signs); and a lower proportion of these signs are used in non-logographic phonetic values.⁸⁶ Similarly, in Egyptian hieroglyphic writing, signs depicting human beings are always logographic references to humans; they never generalized to purely phonetic usage.⁸⁷

The crucial element may have been a sense of distance from linguistic representation, not simply depictive transparency. This point can be illustrated by the patterns of use of the signs that represent the word K'I:N₂ "day" when it occurs in the civil day count calendar (figure 13). One, K'IN (figure 13a, e, b, k), is quite abstract; another, K'IN₂ (figure 13b, f, i, l), is a depiction of the profile face of a sun god, which usually has the abstract K'IN sign infixed. Two others are depictive signs, one for a so-called "grotesque" (figure 13c, g, j) and one for a monkey (figure 13d). Why these last two signs are used for the day position in day counts is not fully understood, but they do not relate depictively or linguistically to "sun" or "day" and metaphoric or mythic symbolism is supposed. Their distance from direct logographic representation of the word *k'i:n* is indicated by the failure of

FIGURE 13

*Signs that, in day count records, are used for the word k'i:n, and their appearances in day counts and in spelling the month name *ya^s=k'i:n.*

Day count context, without ni complement:

- a. Tikal Stela 31;
- b. Yaxchilan Lintel 46;
- c. Tikal Stela 3;
- d. Tikal Stela 12.

Spellings of ya^s=k'i:n, without ni complement:

- e. Tikal Stela 4;
- f. Tikal Stela 12;
- g. Tikal Stela 6, the only instance in which this sign spells *k'i:n* in the month name;

Day count context, with ni complement:

- h. Caracol Stela 1;
- i. Yaxchilan Stela 6;
- j. Dos Pilas Stela 2, the only instance in which this sign takes a ni phonetic complement.

Spellings of ya^s=k'i:n, with ni complement:

- k. Pusilha Stela K;
- l. Palenque Palace Tablet.

a.



b.



c.



d.



e.



f.



g.



121

h.



i.



j.



k.



l.



scribes (with one exception, so far as we know; figure 13g) to use either sign to spell the word *k'i:n* when it occurs in other contexts, such as the month name **ya's=k'i:n*, directional words, and titles. The pattern of complementation is sensitive to these differences. As noted above, K'IN came to be complemented by *ni* during the period A.D. 515-600. Complementation of K'IN₂ was established during the same period but occurred at half the rate. Complementation never was really established for the other two logograms; it does occur in late, sporadic examples at sites (Dos Pilas and Quirigua) showing other evidence of unusually extensive complementation and phonetic spelling. Most likely, then, cognitively distinct types of information were used in interpreting Mayan hieroglyphic texts, some relating to world knowledge, some to language.

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There was, however, a historical basis for phonetic use of depictively transparent signs. When logographic signs did generalize to phonetic usage as signs for CV syllables, this set up a regular correspondence among depicted entities, words for those entities and phonetic values approximating the pronunciations of those words. Comparable correspondences found in other systems—sign form with sign name, for example—motivate the innovation of new values for old signs or of new signs for a phonetic value. In the Mayan case, some depictively transparent signs are used textually only in their phonetic values, never as logograms for their depictive referent—e.g., *wi*, based on *wi* 'root'. Given this pattern of correspondence, new signs could be introduced at will by adapting pictorial forms to glyphic context.

Finally, there was a strong tendency for logographs representing noun and verb roots to be among the roughly square mainsigns in Mayan writing, with logograms for modifiers and grammatical affixes represented more often by elongated signs. This may be an extension of early patterns, with profile head signs being typically for nouns and of roughly square shape and numerals being the most common modifiers and usually elongated.

Sign Organization and Syntactic Organization

Like all other Mesoamerican writing systems, Mayan writing maintained close relations with the iconographic descendants of the symbol system from which writing originated; indeed, it has been argued that Maya iconography played a major role in the development of specifically Maya writing.⁸⁸ At a minimum, both the depictive conventions of sign forms and the organization of signs continued to be influenced by the iconographic system.

A continuing role of iconography in the visual organization of the written record is most obvious in spellings that accord with iconographic usage while conflicting with the pattern of correspondence with language that is otherwise typical of the script. Two illustrative examples mirror depictively-motivated sign organization in early Zapotec texts, discussed above. One concerns verbs for manual actions.⁸⁹ The standard convention for depicting the holding of an object, when the fingers do not curl around it, is to show the flat of the hand outstretched and the object placed above it; i.e., the hand is shown in a conventional, identifiable view rather than in a naturalistic perspective, and is interpreted as though the hand were palm up rather than facing the viewer, and the object is displayed above the hand in which it is to be interpreted as resting. This visually motivated pattern is not “read” top to bottom, but rather is interpreted as a complex; were reading involved, it would be bottom to top. Another example concerns the Maya sign AXAW₂, for the title *a:xa:w*.⁹⁰ Several titles in early Maya-Izapan or Isthmian (Olmecoid) writing evidently descend from headband designs found on Olmec sculpture long before evidence for complex glyphic compounds. These headbands are elongated in form and descend into both Maya and Isthmian writing as elongated signs for titles and/or offices, often as compound signs based on separate components of the headband and/or forehead attachments. When one of these elongated signs is affixed to another sign, whether in Isthmian or Mayan writing, it almost always lies horizontally and in topmost position in the sign complex; this continues the naturalistic position the headbands had occupied in the iconography. We do not know what titles these signs represented in Isthmian writing. In Mayan writing, however, the title *a:xa:w* was represented by one of these elongated signs (AXAW₂), as well as by alternative spellings occupying the full space of a glyph block. Used as an independent glyph block, the mainsign form follows, and this is the correct reading order.⁹¹

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Syntactic relationship was signalled not only by sign proximity but also by the organization of signs within a block. For example, among the Maya month names were spelled by a sequence of two or more signs, as in YAŠ-K'IN and eventually also YAŠ-K'IN-(ni) for **ya's k'in*. In these cases, the signs spelling the name of the month (e.g., YAŠ-K'IN) formed a core sign complex, and the numeral for the day within the month was prefixed to this core as a whole (e.g., 3-[YAŠ-K'IN]). Never did the Maya exploit the logical possibility that the numeral would combine with a subset of signs spelling

the month name to form a core to which the remaining signs would attach (e.g., never [3-YAŠ]-K'IN). Thus, the visual structure of spellings of month names reflected the syntactic structure numeral + month name. Developmentally, this signalling of syntactic relationship by spatial organization was probably as a side effect of signalling by spatial proximity.

The organization of signs did not always admit a clean correlation of syntactic with visual structure. The roughly square mainsign is the central core about which the remaining signs are ultimately organized, with flexibility in organization depending on the placement of elongated signs. Thus, in a block containing one mainsign and two elongated signs, the mainsign is first grouped with one adjacent elongated sign and then this pair is grouped with the remaining elongated sign (*figure 10*). When one elongated sign was placed vertically and the other horizontally, this produced a structure in which the mainsign and one elongated sign form a substructure; otherwise, no visual substructure is apparent. When instead the referents of the two elongated signs form a single syntactic constituent excluding the referent of the mainsign, then the visual organization of signs and the syntactic organization of morphemes must disagree (*figure 14*). For example, when the numeral classifier #*te* is suffixed to a numeral, this unit modifies a following month name grammatically. For the spelling, however, only two visual structures are feasible. One is [numeral-[TE-month]], as in [3-[TE-SOČ']] (*figure 14a*), where the numeral is prefixed to a graphic unit consisting of the numeral classifier + month name; this structure conflicts with the syntactic organization of #*oš-te so'č'*. The other feasible visual structure in this case is [numeral-TE-month], where the numeral, TE, and the month compound are in a linear sequence, horizontally (*figure 14b*) or vertically (*figure 14c*); in this structure, no visual organization is apparent.

In cases of direct conflict between the preferred visual organization of signs and the syntactic structure of the words represented, the visual preference was almost always maintained; in contexts (like numeral + month name) in which syntactic organization could always be reflected accurately, visual organization almost never conflicts. Thus, a syntactically sensitive system of sign organization was developed that must have shaped and been shaped by the Maya understanding of word grammar.

A possible side effect of the correlation of sign organization with word structure is that elongated signs strongly correlating with a particular grammatical

a.



construction (verb suffixes, for instance) seem to have developed sign-specific preferences for organization with respect to the core of a sign complex and the peripheral elongated signs organized around it. These organizational preferences sometimes motivated sign sequences that conflict with the order of the linguistic elements to which they correspond,⁹² as had the iconographically-based positional preferences. For example, the sign *ya*/-IX was suffixed immediately below the core mainsign for time periods when it represented temporal distance suffixes, and when it represented a completive aspect suffix it was normally suffixed immediately below either the core complex representing the verb or the core expanded by one additional verb suffix. Spellings of the month name #*k'anasi* with its signs in linguistically correct sequence can only adopt a visually noncommittal sign organization or one in which *ya*/-IX is the most peripheral sign in the spelling; in a small minority of instances, the sign is appended instead to the mainsign core of the compound, resulting in a linguistically incorrect sign sequence. Several cases of variable sign sequencing seem attributable to this sort of extension.

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CONCLUDING REMARKS

The iconography of incised ceremonial celts established the basic features of Mesoamerican writing. Independent symbols were segmented off from their pictorial contexts as parts of figures; so segmented, they rendered particular concepts, independent of pictorial context. The context of

b. c.



FIGURE 14

Visual organization not according with syntactic organization.

- a. [**3**-[**TE**-**SO**']], Arroyo de Piedra Stela 1; the numeral classifier **TE** and the month sign **SO** form a visual sub-block not including the numeral **3**;
 b. [**5**-**TE**-[**IHK**'-**K**'-**AT**-(**ta**)]], Naranjo Stela 10; levels of sign organization including **TE** also include both the numeral **5** and the month compound **IHK**'-**K**'-**AT**-(**ta**);
 c. [**5**-**TE**-[**CAK**-**K**'-**AT**-(**ta**)]], Naranjo Stela 10; levels of sign organization including **TE** also include both the numeral **5** and the month compound **CAK**-**K**'-**AT**-(**ta**).

use of this iconography, on ritual objects with heavy political overtones, was probably limiting enough that the relationships among the referents of individual units could be inferred from the identification of those referents. Juxtaposition therefore sufficed as an organizing principle for these units, pre-adapting them for interpretation via sequences of linguistic units to which they correspond *de facto*, and related sets of symbols were evidently placed in close proximity to one another, relative to the remaining symbols. This deviant subsystem of Olmec-style iconography therefore provided the basis for an ideographic system of iconography homologous to a primitive logographic system of writing in which grammatical variation was neglected.

As this precursor system was essentially a genre of Olmec-style iconography, so the earliest scripts maintained a tight integration of iconographic and written genres, with some practices continuing to be shared between them. New signs were continually added to scripts, based on pictorial conventions for representing objects in the world. Conversely, written compounds served in place of pictorial units in scenes, or as "captions" comparable to the pictorial icons identifying saints in Christian iconography. In the Oaxacan area, both the functions of writing and the visual contexts of use of writing narrowed considerably, until writing served only these identifying-icon functions. Nonetheless, this trend was not accompanied by a shift to pictorial imagery for identifiers; logographic representation was maintained, and phonetic representation via rebus evidently increased, even perhaps to incipient pure-phonetic representation among the Aztec. In the Southeastern region, the range of functions of writing increased, and a full textual tradition was maintained. The Isthmian tradition of writing is little in evidence, though it may have continued outside of monumental contexts. Mayan writing developed into a logosyllabic system whose logographic and syllabic signs were both heavily utilized.

The depictive transparency of signs in most Mesoamerican scripts makes a large sign inventory less onerous than in more abstract systems in which the relation of sign to significance is much more arbitrary. No trend toward reduction of sign inventories has been demonstrated for these scripts, and, indeed, the inventories do not seem to have been static at all, new signs being added based on pictorial conventions for representing objects in the world. In this respect, Mesoamerican and Egyptian writing seem comparable, and contrast with the cuneiform scripts. Isthmian writing is much less transparent iconically, or at least the conventions of its pictorial system are less obvious to us. The amount of

sign repetition among and within Isthmian texts impressionistically suggests a more limited sign inventory for Isthmian, and perhaps more extensive phonetic representation, than for Mayan.

The linguistic representational principles of Mesoamerican scripts appear to be largely derivable from the grammatical structures of words in the languages they represented, with respect both to the distinctions they fail to represent and to how they represent what they do represent. Representational conventions appear to have spread by processes of analogical change. These analogies are carried mainly via correlations with particular types of linguistic information, and otherwise most successfully for spelling rarer forms.

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NOTES

- ¹ John S. Justeson. 1986. "The Origins of Writing: Preclassic Mesoamerica." *World Archaeology* 17:437-58.
- ² Hanns J. Prem. 1971. "Calendrics and Writing." In *Observations on the Emergence of Civilization in Mesoamerica*, ed. by Robert F. Heizer and John A. Graham, 112-32. Berkeley: University of California Archaeological Research Facility Contribution 11. Prem, 1973. "A Tentative Classification of Non-Maya Inscriptions of Mesoamerica." *Indiana* 1:29-58. Michael D. Coe. 1976. "Early Steps in the Evolution of Maya Writing." In *Origins of Religious Art and Iconography in Preclassic Mesoamerica*, ed. Henry B. Nicholson, 107-22. UCLA Latin American Studies Series, vol. 31. Tatiana Proskouriakoff. 1971. "Early Architecture and Sculpture in Mesoamerica." In *Observations on the Emergence of Civilization in Mesoamerica*, 141-56. John S. Justeson, William M. Norman, Lyle Campbell and Terrence Kaufman. 1985. *The Foreign Impact on Lowland Mayan Language and Script*. Middle American Research Institute Publication 53. New Orleans: Tulane University Press. Justeson. "Origins of Writing," 442-45. Prem relates writing to Olmec-style relief carving in particular, and to a postulated tradition of narrative pictography, neither of which, in our view, contributed directly to the emergence of writing. Others discuss the contribution of the Olmec style without emphasis on particular genres.
- ³ For an illustration of the Olmec style across many genres, focusing on its status as political iconography, see F. Kent Reilly III, "Cosmos and Rulership: the Function of Olmec-Style Symbols in Formative Period Mesoamerica," in this issue.
- ⁴ Kent V. Flannery. "The Olmec and the Valley of Oaxaca: a Model for Interregional Interaction in Formative Times." In *Dumbarton Oaks Conference on the Olmec*, ed. Elizabeth P. Benson, 79-117. Robert D. Drennan. 1983. "Ritual and Ceremonial Development at the Early

Village Level." In *The Cloud People*, ed. by Kent V. Flannery and Joyce Marcus, 46–50. New York: Academic Press.

- ⁵ This section elaborates on Justeson, "Origins of Writing," 442–44.
Proskouriakoff first called attention to the key elements of celt iconography relating to writing that we develop here, in "Early Architecture and Sculpture in Mesoamerica," 148.
- ⁶ Coe. "Early Steps in the Evolution of Maya Writing," 111.
- ⁷ Proskouriakoff. "Early Architecture and Sculpture in Mesoamerica," 147–48; Justeson, "Origins of Writing," 442.
- ⁸ Proskouriakoff. "Early Architecture and Sculpture in Mesoamerica," 147–48.
- ⁹ For example, see figures 27 and 28 in Michael D. Coe. 1965. "The Olmec Style and its Distribution." In *Handbook of Middle American Indians* 3:739–75.
- ¹⁰ For example, in two of the five celts from La Venta Offering 2; see figure 35 in Philip Drucker, Robert F. Heizer and Robert J. Squier. 1957. In *Excavations at La Venta, Tabasco, 1955*, Bureau of American Ethnology Bulletin 170, Smithsonian Institution, Washington.
- ¹¹ Justeson, "Origins of Writing," figure 3d–f.
- ¹² Virginia E. Miller. 1983. "A Re-examination of Maya Gestures of Submission." *Journal of Latin American Lore* 9:17–38.
- ¹³ Based on the circular elements at the fingers of this hand, Justeson ("Origins of Writing," figure 3e) suggests that it indicates the ritual casting of corn (or blood or incense resin). On another celt (figure 1d), another segmental, braceleted hand in what is probably the same posture has markings that could be intended to indicate either scarification or the holding of grains or droplets in the palm.
- ¹⁴ Note that the sequencing of smaller groups of graphic units need not and in fact does not agree with the order of corresponding units in spoken language; this was also true of earliest cuneiform practice.
- ¹⁵ Prem. "Calendrics and Writing," 112–13, 126.
- ¹⁶ For illustrations of such conventions, see Troike. "Pre-Hispanic Pictorial Communication: the Codex System of the Mixtec of Oaxaca, Mexico," in this issue.
- ¹⁷ John S. Justeson, William M. Norman and Norman Hammond. 1988. "The Pomona Flare: a Preclassic Maya Hieroglyphic Text." In *Maya Iconography*, eds. Elizabeth P. Benson and Gillett Griffin, 94–151, Princeton University Press.
- ¹⁸ John S. Justeson and Peter Mathews. 1989. "Relationships between Maya and Isthmian Hieroglyphic Writing, with Special Reference to La Mojarra Stela 1." Unpublished manuscript.
- ²⁰ This deity was identified by Alfonso Caso as the god of rain and lightning, and this identification is generally accepted. Alfonso Caso. 1928. *Las Estelas Zapotecas*, Talleres Gráficos de la Nación, Mexico, 45–51.
- ²¹ Years were named for the day on which they began or ended; people were named for the day of their birth or "baptismal" rituals.
- ²² It could, for example, be an unconscious side effect of adjusting hand or arm position after a syntactic or semantic grouping is completed.
- ²³ In the other cases, it is not yet clear whether the surmounting sign refers to an individual.
- ²⁴ Justeson and Mathews. "Relations between Maya and Isthmian Hieroglyphic Writing."
- ²⁵ Robert J. Sharer and David W. Sedat. 1987. *Archaeological Investigations in the Northern Maya Highlands, Guatemala: Interaction and the Development of Maya Civilization*. University Museum Monograph 59, 169. Philadelphia: University Museum, University of Pennsylvania. Robert J. Sharer. 1989. "The Preclassic Origins of Maya Writing: a Highland Perspective." In *Word and Image in Maya Culture: Explorations in Language, Writing, and Representation*,

eds. William F. Hanks and Don S. Rice, 165–75. Salt Lake City: University of Utah Press.

- ²⁶ Alternatively, it could be a grammatical suffix (cf. figure 2i) or phonetic complement (cf. figure 2h), as in the seating verbs on the Leyden Plaque.
- ²⁷ See discussion under *Mayan Developmental Trends*, below.
- ²⁸ Justeson and Mathews. "Relations between Maya and Isthmian Hieroglyphic Writing."
- ²⁹ Justeson et al. *Foreign Impact*, 40.
- ³⁰ The practice could go back to the Middle Preclassic, but it is not documented by the handful of texts from this era.
- ³¹ That is, reading did not proceed from block n of column $2i-1$ to block $n+1$ of that column, but to block n of the adjacent column $2i$ and only then to block $n+1$ of column $2i-1$. This double-column format is unknown until c. 50 B.C. Marcus considers double-column format a possibility for Zapotec writing, but the signs in adjacent columns align poorly, due to differences in sign size, and in some instances reading clearly passes from the bottom of the first member of a hypothetical pair to the top of the next. See Justeson et al. *Foreign Impact*, n.28, 45–47. Joyce Marcus. 1976. "The Origins of Mesoamerican Writing." *Annual Review of Anthropology* 5:35-67. See pp. 45–47. Marcus. 1980. "Zapotec Writing." *Scientific American* 242(2): 50–64. Marcus. 1983. "The First Appearance of Zapotec Writing and Calendrics." In *The Cloud People*, 91–96.
- ³² In the Isthmian script group such sequences can be recognized on the recently discovered La Mojarrá Stela 1 (see Stross, this volume, figure 3); for such sequences at Monte Alban, see Justeson et al. *Foreign Impact*, n.22, refuting p. 49 of Gordon Whittaker. 1980. "The Hieroglyphs of Monte Alban." Ph.D. diss., Yale University. Ann Arbor: University Microfilms International.
- ³³ M. Coe. "The Olmec Style," 756.
- ³⁴ David C. Grove. 1970. *The Olmec Paintings of Oxtotitlán Cave, Guerrero, Mexico*, Studies in Pre-Columbian Art and Archaeology pp.6,20 and 32. Washington, D.C.: Dumbarton Oaks. Justeson et al. *Foreign Impact*, 34. Justeson. "Origins of Writing," 444.
- ³⁵ Justeson. "Origins of Writing," 445.
- ³⁶ Rainer Berger, John A. Graham and Robert F. Heizer. 1967. "A Reconsideration of the Age of the La Venta Site." In *Studies in Olmec Archaeology*, 1–24. Berkeley: University of California Archaeological Research Facility Contributions, 3. William F. Rust and Robert J. Sharer. 1988. "Olmec Settlement Data from La Venta, Tabasco, Mexico." *Science* 242:102–04.
- ³⁷ David C. Grove and Jorge Angulo V. 1987. "A Catalog and Description of Chalcatzingo's Monuments." In *Ancient Chalcatzingo*, ed. David C. Grove, 114–31. Austin: University of Texas Press. Jorge Angulo V. 1987. "The Chalcatzingo Reliefs: Iconographic Analysis." In *Ancient Chalcatzingo*, 132–158.
- ³⁸ Marcus. "Origins of Mesoamerican Writing," 44–45.
- ³⁹ Robert J. Sharer and David W. Sedat. 1973. "Monument 1, El Porton, Guatemala and the Development of Maya Calendrical Systems and Writing." In *Studies in Ancient Mesoamerica*, ed. by John A. Graham, 177–94. Berkeley: University of California Archaeological Research Facility Contributions 18.
- ⁴⁰ These groups were originally proposed by Prem ("Calendrics and Writing" and "Non-Maya Inscriptions of Mesoamerica"), with further evidence provided by Justeson et al., *Foreign Impact*, 38–44.
- ⁴¹ The term "Isthmian" (actually, "Early Isthmian") was suggested for designating this script group by John Graham. 1971. "Commentary on 'Calendrics and Writing'." In *Observations on the Emergence of Civilization in Mesoamerica*, 133–40, and for the culture generally by Gareth W. Lowe and Dee F. Green. 1967. *Altamira and Padre*

Piedra, Early Preclassic Sites in Chiapas, Mexico. New World Archaeological Foundation Paper 20.

- ⁴² Justeson, "Origins of Writing," 451.
- ⁴³ P. 335, n.3 in John S. Justeson. 1978. *Maya Scribal Practice in the Classic Period: a Test-Case of an Explanatory Approach to the Study of Writing Systems*. Ann Arbor: University Microfilms International.
- Gordon Whittaker. 1983. "The Structure of the Zapotec Calendar." In *Calendars of Mesoamerica and Peru*, ed. Anthony Aveni and Gordon Brotherston, 99–133. British Archaeological Reports. Justeson et al. *Foreign Impact*, 45.
- ⁴⁴ Marcus. "Origins of Mesoamerican Writing," 45; Whittaker. *Hieroglyphs of Monte Alban*, 42, 45.
- ⁴⁵ Justeson. *Mayan Scribal Practice*, 335–46; Whittaker. *Hieroglyphs of Monte Alban*, 47.
- ⁴⁶ Ignacio Bernal. 1965. "Archaeological Synthesis of Oaxaca." *Handbook of Middle American Indians* 3:788–813. Joyce Marcus. 1983. "The Style of the Huamelulpan Stone Monuments." In *The Cloud People*, 125–26.
- ⁴⁷ Christopher Moser. 1977. *Nũñe Writing and Iconography of the Mixteca Baja*. Vanderbilt University Publications in Anthropology, 19.
- Christopher Moser. 1983. "The Middle Classic Nũñe Style of the Mixteca Baja, Oaxaca: a summary report." In *The Cloud People*, 211–13.
- ⁴⁸ Caso. *Las Estelas Zapotecas*, 65.
- ⁴⁹ P. 135 in Alfonso Caso. 1947. "Calendario y Escritura de las Antiguas Culturas de Monte Alban." In *Obras completas de Miguel Othon de Mendizabal*, vol. 1, 5–102 (Mexico). Caso. "Zapotec Writing and Calendar," 938–40.
- ⁵⁰ Prem. "Calendrics and Writing," 121–22.
- ⁵¹ Whittaker. *The Hieroglyphs of Monte Alban*, 5.
- ⁵² P. 938 in Alfonso Caso. 1965. "Zapotec Writing and Calendar." In *Handbook of Middle American Indians* 3:931–47. Marcus. "The First Appearance of Zapotec Writing and Calendrics," 94.
- ⁵³ Prem. "Calendrics and writing," 120–21. Whittaker takes it as enumerating the twenty groups of thirteen days in the ritual calendar; a count of twenty-day months within the 365-day year fits the data better, but discrepancies remain.
- ⁵⁴ Identified as a knotted bag by Caso, *Las Estelas Zapotecas*, 65.
- ⁵⁵ Linda D. Schele and Jeffrey H. Miller. 1983. *The Mirror, the Rabbit, and the Bundle: "Accession" Expressions from the Classic Maya Inscriptions*. Studies in Pre-Columbian Art and Archaeology 25. Washington, D.C.: Dumbarton Oaks.
- ⁵⁶ Terrence S. Kaufman. 1983. "Comparative Oto-Manguan Phonology." Unpublished manuscript.
- ⁵⁷ A small proportion of CV and CVCVCV roots existed, e.g., proto-Zapotecan *ka:'sweet potato', proto-Zapotecan #tiyaka 'ear', mostly for concrete nouns representable via depictive conventions. The few non-concrete roots, such as proto-Zapotec *nawi'ini' "small", could have provided a basis for the emergence of simple phonetic spelling from rebus.
- ⁵⁸ Alfonso Caso. 1965. "Mixtec Writing and Calendar." In *Handbook of Middle American Indians* 3:948–51. Mary Elizabeth Smith. 1973. *Picture Writing from Ancient Southern Mexico*. Oklahoma City: University of Oklahoma Press. Smith. 1983. "The Mixtec Writing System." In *The Cloud People*, 238–45.
- ⁵⁹ Caso. "Zapotec Writing and Calendar," p.938–40. Joyce Marcus. 1976. "The Iconography of Militarism at Monte Alban." In *Origins of Religious Art and Iconography in Preclassic Mesoamerica*, 123–39. Marcus. 1983. "The Conquest Slabs of Mound J, Monte Alban." In *The Cloud People*, 106–08. Whittaker. *Hieroglyphs of Monte Alban*, 92–182. Whittaker. 1983. "The Tablets of Mound J at Mont Alban." In *International Colloquium: the Indians of Mexico in Pre-Columbian*

- and *Modern Times*, eds. Martin Jansen and Th. J. Leyenaar, 50–86. Rutgers, Leiden: Rutgers.
- ⁶⁰ Troike, this issue. M.E. Smith. "The Mixtec Writing System." Smith. *Picture Writing from Ancient Southern Mexico*, 40–41.
- ⁶¹ Prem. "Calendrics and Writing," 120.
- ⁶² Caso. "Zapotec Writing and Calendar," 942.
- ⁶³ Gordon Whittaker. 1977. "The Evolution of Writing in Central Mexico." Paper presented at the 42nd annual meeting of the Society for American Archaeology. Whittaker. *The Hieroglyphics of Monte Alban*, 20–21. Joyce Marcus. 1983. "Changing Patterns of Stone Monuments after the Fall of Monte Alban." In *The Cloud People*, 191–97.
- ⁶⁴ Screenfold books have been recovered from Maya burials around this time, c. A.D. 350–650, two from Mirador, Chiapas and one from Altun Ha, Belize. Jorge Angulo V. 1970. "Un Posible Códice de El Mirador, Chiapas." In *Instituto Nacional de Antropología y Historia Departamento de Prehistoria, Serie Tecnología*, núm. 4. Pierre Agrinier. 1975. *Mounds 9 and 10 at Mirador, Chiapas, Mexico*. New World Archaeological Foundation Paper 39. David M. Pendergast. 1979. *Excavations at Altun Ha, Belize, 1964–1970*, vol. 1, Royal Ontario Museum.
- ⁶⁵ Prem. "Calendrics and Writing," 112–113, 114–15, 126.
- ⁶⁶ Marcus. "Origins of Mesoamerican Writing," 45. "Zapotec writing," 53, 55. Kent V. Flannery and Joyce Marcus. 1983. "The Growth of Site Hierarchies in the Valley of Oaxaca: Part I." In *The Cloud People*, 53–64.
- ⁶⁷ Whittaker. *The Hieroglyphs of Monte Alban*, 104–05. Justeson et al. *Foreign Impact*, 34. These stylistic observations were presented in discussions supporting a later date for the monument; at the time, the excavators' publications had not indicated that the dating was determined stratigraphically.
- ⁶⁸ Kent V. Flannery. 1985. Personal communication.
- ⁶⁹ Fernando Winfield Capitaine. 1988. "La Estela I de La Mojarra, Veracruz, Mexico." *Research Reports on Ancient Maya Writing* 16, 22.
- ⁷⁰ Winfield Capitaine. "La Estela 1 de La Mojarra, Veracruz, Mexico." An illustration is provided as figure 3 in Brian Stross's paper "Mesoamerican Writing at the Crossroads: the Late Formative," this issue.
- ⁷¹ Justeson et al. *Foreign Impact*, 41–44. Justeson. "Origin of Writing," 451.
- ⁷² Justeson and Mathews. "Relations between Maya and Isthmian Hieroglyphic Writing."
- ⁷³ Cf. Justeson et al. *Foreign Impact*, 3, 72–73 n.3.
- ⁷⁴ Terrence S. Kaufman. 1963. *Mixe-Zoque Diachronic Studies*. Unpublished monograph.
- ⁷⁵ Justeson. "Origin of Writing," 451–52.
- ⁷⁶ James A. Fox and John S. Justeson. 1982. "Hieroglyphic Evidence for the Languages of the Lowland Maya." Revised version in *New Interpretations of Maya Writing and Iconography*, ed. Richard M. Leventhal and John S. Henderson. (In press.) Justeson et al. *Foreign Impact*, 66–68.
- ⁷⁷ Justeson et al. *Foreign Impact*, 44. Justeson. "Origins of Writing," figure 8b,c.
- ⁷⁸ Justeson and Mathews. "Relations between Maya and Isthmian Hieroglyphic Writing."
- ⁷⁹ The band and the U-shaped element evidently had separate associations with the seating sign. In the Late Classic examples with ovals, the band is infixed to the torso and a small circle is infixed at the thigh; the circle descends from the U-shaped element in Maya signs generally. A third infix came to be associated with the sign as well, a phonetic complement representing the syllable *mu* and indicating the Lowland Mayan word **kum* "to sit". It was not an alternative for either the banded oval or the U-element; these are sometimes infixed

to the torso with the complement suffixed below the seating sign (figure 9e,c), and in the Late Classic examples the small circle is usually infixed to the thigh when the complement is infixed to the torso.

- ⁸⁰ Lee A. Parsons. 1988. "Proto-Maya Aspects of Miraflores-Arenal Monumental Stone Sculpture from Kaminaljuyu and the Southern Pacific Coast." In *Maya Iconography*, 6–43.
- ⁸¹ John S. Justeson. 1989. "The Representational Conventions of Mayan Hieroglyphic Writing." In *Word and Image in Maya Culture*, 25–38, see especially 30–33. Justeson. "Origin of Writing," 451–53.
- ⁸² There is no standard orthography for transcribing Mayan words. We use an orthography fairly standard in linguistic work on Amerindian languages, which conflicts in some features with colonial Spanish-based orthographies; both are widely used. Our orthography is essentially that of the International Phonetic Alphabet, except that we use *s* in place of *š*. Potential confusions with colonial orthography that appear in this paper: *x* is for a velar fricative, not for *š*; *k* (not *c*) is for a plain (not glottalized) velar stop.
- ⁸³ John S. Justeson and Laurence D. Stephens. 1981. "Elamite Spellings of Closed Syllables." Paper presented at the annual meeting of the American Oriental Society, Boston. Justeson and Stephens. 1988. "Representational Variation and Analogical Change in Elamite Spelling." Paper presented at the annual meeting of the Linguistic Society of America, New Orleans. Justeson and Stephens. 1990. "Representational Variation and Change." Paper presented at the Workshop on an Explicitly Scientific Cognitive Archaeology, Cambridge University.
- ⁸⁴ John S. Justeson and Peter Mathews. 1989. "Comparative Perspectives on Mayan Script Development." Paper presented at the Symposium on the Language of Maya Hieroglyphs, University of California, Santa Barbara.
- ⁸⁵ Justeson. "Origins of Writing," 453.
- ⁸⁶ Justeson. *Mayan Scribal Practice*, 267–68. Justeson. "Mayan Representational Conventions," 29.
- ⁸⁷ P. Kaplony. 1972. "Die Prinzipien der Hieroglyphenschrift." In *Textes et Langue de l'Égypte Pharaonique*, Cairo.
- ⁸⁸ David Friedel and Linda Schele. 1988. "Symbol and Power: a History of the Lowland Maya Cosmogram." In *Maya Iconography*, 44–93.
- ⁸⁹ Justeson. "Origins of Writing," 449–50.
- ⁹⁰ Justeson and Mathews. "Relations Between Maya and Isthmian Hieroglyphic Writing."
- ⁹¹ Peter Mathews and John S. Justeson. 1984. "Patterns of Sign Substitution in Maya Hieroglyphic Writing: the 'Affix Cluster'." In *Phoneticism in Mayan Hieroglyphic Writing*, eds. John S. Justeson and Lyle Campbell, 185–231. Albany, New York: Institute for Mesoamerican Studies Publication 9.
- ⁹² John S. Justeson. 1979. "Variable and Antilinguistic Order of Signs in Script." Paper presented at the International Conference on Phoneticism in Mayan Hieroglyphic Writing, SUNY Albany.

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11 Kinross. "Rhetoric of Neutrality," 21.

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