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CONTENTS

- The Western Man in the Eastern Parlor: Alfred Bush and
the Princeton Collections of Western Americana *page* 221
Stephen Aron
- A Zapotec Carved Bone 225
John M. D. Pohl and Javier Urcid Serrano
- Brand Books in the Princeton Collections of Western
Americana 237
William S. Reese
- A Native Among the Headhunters 252
Ann Fabian
- A Stereoscopic View of the American West 271
Martha A. Sandweiss
- Photographs of the 1862 Sioux Revolt: From National
Sensation to Ethnographic Documentation 290
Heather A. Shannon
- The Making of Edward S. Curtis's *The North American
Indian* 314
Mick Gidley
- A Witness at Wounded Knee, 1973 330
Owen Luck

Full Circle: From Disintegration to Revitalization of Otterskin Bag Use in Great Lakes Tribal Culture Anton Treuer	359
The Association on American Indian Affairs and the Struggle for Native American Rights, 1948–1955 Paul C. Rosier	366
Indian Politics in Cold War America: Parallel and Contradiction Daniel M. Cobb	392
Otterskins, Eagle Feathers, and Native American Alumni at Princeton Alfred L. Bush	420
Library Notes Gardner’s Photographic Sketch Book of the War Julie L. Mellby	435
New and Notable	441
Friends of the Library	488
Cover Note Alfred L. Bush	497

ILLUSTRATIONS

Zapotec engraved bone	<i>page</i> 226
Confederacies of Mesoamerica's Late Postclassic period	227
Zapotec and Nahuatl calendar signs and names	230
Drawings of the Princeton Zapotec bone	231
Bones from Tomb 7 at Monte Albán, Mexico	233
Day signs carved on a manatee mandible	235
A sixteenth-century Italian horse brand	239
A nineteenth-century cattle brand book from Argentina	241
Examples of nineteenth-century Spanish brands	243
First page of the "Deseret Brand Book"	245
Entries from the brand book for Hill County, Texas	247
Examples of brands from the Cherokee Strip	249
Brand book of the Kansas Frontier Stock Association	250
A Flathead skull from <i>Crania Americana</i>	253
"Stum-Ma-Nu: A Flat-Head Boy"	257
A Flathead cradle	264
Timothy O'Sullivan, "Ruins in Cañon de Chelle, N.M."	273
Verso of O'Sullivan, "Ruins in Cañon de Chelle, N.M."	277
Richard Kern, "Ruins of an Old Pueblo in the Cañon of Chelly"	280
Timothy O'Sullivan, "Ruins in the Cañon de Chelle, New Mexico"	283
Adrian J. Ebell, "Squaws Guarding Corn from Blackbirds"	293

Adrian J. Ebell, “People Escaping from the Indian Massacre of 1862”	294
Adrian J. Ebell, “The Breakfast on the Prairie”	295
Joel E. Whitney, “Cut Nose”	297
Joel E. Whitney, “Paha Uza-Tanka”	297
Joel E. Whitney, “Portraits of Indians Connected with the Minnesota Massacre”	298
Joel E. Whitney, “Te-Na-Se-Pa”	299
Joel E. Whitney, “One of the Executed Indians”	299
Benjamin Franklin Upton, “Sioux Captives”	301
Benjamin Franklin Upton, “Wowinape, Little Crow’s Son”	302
Benjamin Franklin Upton, “Fort Snelling”	303
Joel E. Whitney, “Sha-Kpe”	305
Benjamin Franklin Upton, portrait of Little Six	305
Joel E. Whitney, “Ta-Tanka-Nazin”	307
Joel E. Whitney, reissued portrait of Ta-Tanka-Nazin	307
Joel E. Whitney, portrait of Medicine Bottle	307
Leaf from <i>Photographs of North American Indians</i>	310–11
Edward S. Curtis, “Navaho Medicine Man”	321
Edward S. Curtis, “Ta‘thámichě—Walapai”	323
Edward S. Curtis, “A Drink in the Desert—Navaho”	325
Publication outline for <i>The North American Indian</i>	327
Owen Luck, Demonstration outside the Bureau of Indian Affairs building, Pine Ridge	333
Owen Luck, U.S. Marshals and FBI agents at a roadblock	335
Owen Luck, Elders gathering at Wounded Knee	336
Owen Luck, Defensive fortifications	337

Owen Luck, A ceremony at Wounded Knee	338
Owen Luck, Leonard Crow Dog lights the pipe	341
Owen Luck, Frank Fools Crow offers the pipe	342
Owen Luck, Honoring the first man shot at Wounded Knee	343
Owen Luck, Frank Fools Crow prays with the pipe	344
Owen Luck, Lakota security at a roadblock	349
Owen Luck, An FBI roadblock	351
Owen Luck, Frank Fools Crow at home in Kyle	353
Owen Luck, Tom Bad Cob outside the Rapid City Jail	356
An otterskin “woompa” bag	358
Details of beadwork on the “woompa” bag	360, 361
Logo of the Association on American Indian Affairs	367
Oliver La Farge	372
Felix S. Cohen	373
Alexander Lesser, Oliver La Farge, and Richard D. Searles	384
“American Indians Protect You!”	395
Oliver La Farge	397
The American Indian Point IV Program	402
LaVerne Madigan	404
An otterskin bookbinding	423
An eagle feather headdress	425
Fred Fitch adopted by the Sioux	426
White Roots of Peace Teepee	431
American Indian students on the steps of Whig Hall	432
Kevin Gover receiving an honorary degree	434

David Knox, "Field Telegraph Battery Wagon"	439
Yoshitoshi Tsukioka, <i>Portrait of a Geisha Seated for Her Photographic Portrait</i>	449
Seventeenth-century needlework patterns	453
Thomas Conder, "York Town, and Gloucester Point, as Besieged by the Allied Army"	456
Ananda K. Coomaraswamy	459
Sketch by Lady Elizabeth Butler	467
Gold ducat of Dorino Gattilusio	479
William Temple Allen, sketch of Nassau Hall	481
The martyrdom of St. Thomas à Becket	484
A Chinese official, 1928	487
Karin Trainer with outgoing Friends officers	494

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A Zapotec Carved Bone

JOHN M. D. POHL

AND JAVIER URCID SERRANO

PRINCETON University Library's Department of Rare Books and Special Collections preserves many original examples of pictographic writing in the indigenous languages of the Americas. Among these is an unusual bone fragment (fig. 1). It has been attributed to the Zapotec civilization of southern Mexico on the basis of its similarities in style and material to excavated objects, but attribution to the Mixtecs, Eastern Nahuas, or the peoples they dominated should not be ruled out.

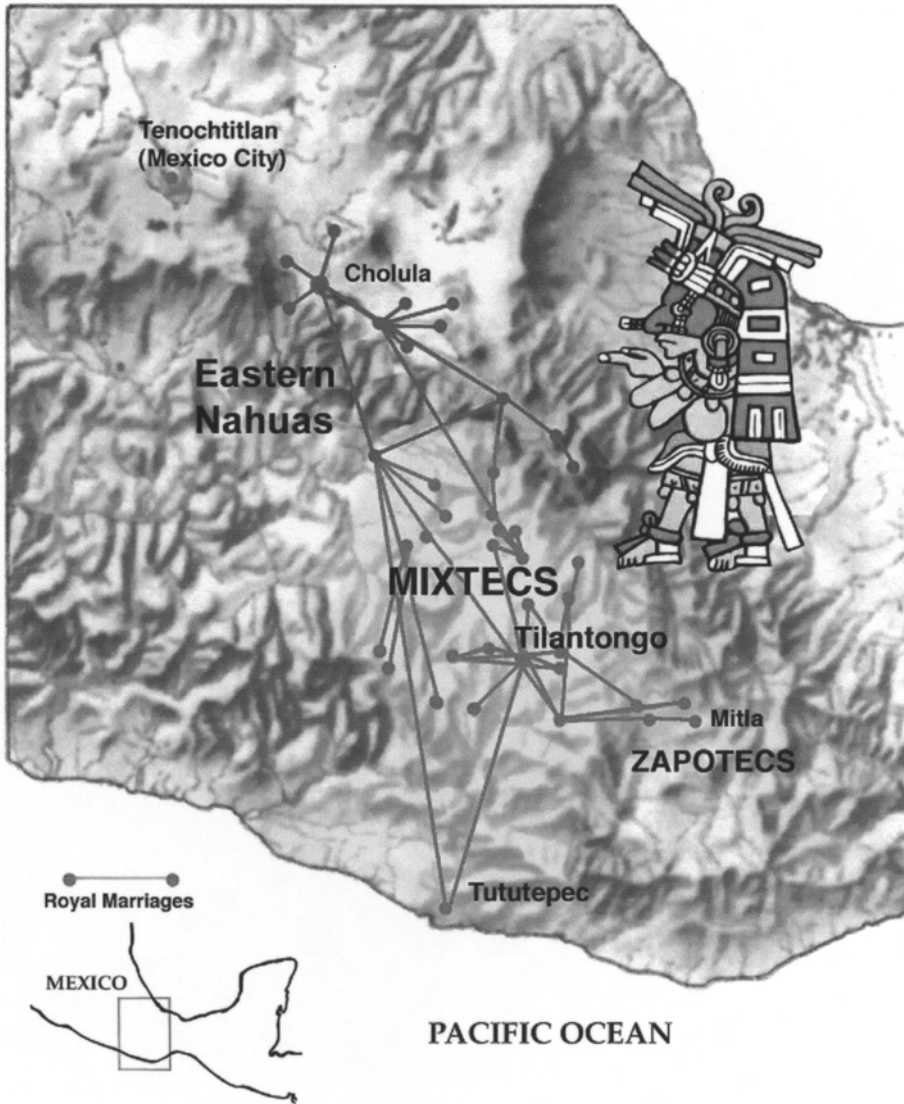
For more than thirteen hundred years, between 500 B.C.E. and 800 C.E., the Zapotecs dominated much of southwestern Mexico from the mountain-top city-state of Monte Albán, located in the Valley of Oaxaca. Then, for reasons that are still debated, they abandoned the citadel at the end of the Classic period and moved to the valley floor to reformulate themselves into scores of independent kingdoms. They then enriched themselves through the greater Postclassic Mesoamerican world system by building strategic alliances with the neighboring Mixtecs to the west and the Nahuas to the north.¹ The pictographs inscribed on the Princeton bone are representative of a period of time when the Zapotecs adopted the new forms of art and writing promoted by their alliance partners (fig. 2).

Although fragmentary at just under 9 centimeters and worn from handling, both the width and the curvature of the Princeton bone suggest that it was part of a deer femur. Line engraving appears on the femur's exterior and consists of a series of signs and numerals illustrating five days from a sacred calendar used throughout the central and southern Mexican highlands during the Late Postclassic period from 1300 C.E. up to, and in some cases through, the early colonial Spanish period. The exact use for which the bone was fashioned is difficult to

¹ John M. D. Pohl, "Creation Stories, Hero Cults, and Alliance Building: Postclassic Confederacies of Central and Southern Mexico from A.D. 1150–1458," and Pohl, "Royal Marriage and Confederacy Building among the Eastern Nahuas, Mixtecs, and Zapotecs," in *The Postclassic Mesoamerican World System*, ed. Michael Smith and Frances Berdan (Salt Lake City: University of Utah Press, 2003), 55–59, 205–8.



1. Zapotec engraved bone. At its tallest and widest points it measures 8.9×2.0 cm. Princeton Mesoamerican Manuscripts, no. 2, Manuscripts Division, Department of Rare Books and Special Collections, Princeton University Library. Gift of J. Lionberger Davis, Class of 1900.



2. During Mesoamerica's Late Postclassic period, 1300–1450 c.e., the southern Mexican highlands were dominated by confederacies of Eastern Nahuas, Mixtecs, and Zapotecs, whose royal families intermarried to form strategic alliance corridors. Ultimately, the Nahuja-Mixteca pictographic style fostered by their royal houses was adopted by more than a dozen different language groups. Illustration by John Pohl.

determine. It may have been part of a flutelike instrument, which would explain its vertical orientation when invoking the calendrical symbolism, or it may have served as the handle for some ritual object—a feather fan, for example.

When historian Paul Kirchhoff first introduced the term “Mesoamerica,” he defined it as a geographical area where the native inhabitants were united by a common history and shared religious beliefs, art, architecture, science, and technology that made them unique in the Americas. Chief among the cultural attributes he defined was the use of a unique calendrical system. Time was accurately measured by careful observation of the sun, moon, and stars. Its passage was perceived in terms of cycles, during which certain patterns of events could repeat themselves. Prophecy was therefore an important part of determining the future on the basis of the experiences of the past.

Two calendars were employed in Mesoamerica. The first was the 365-day solar calendar, used to measure the passage of time important to the annual agricultural cycle. A year consisted of eighteen months divided into twenty days, plus a final period of five days. These last five days were considered to be a period of danger when time itself might cease, and so special ceremonies were held to assuage harmful spirit forces and ensure that the new year would begin auspiciously. Some scholars believe that this completion period allowed Mesoamerican cultural groups to reexamine their calendar annually and adjust it without the need for a leap year.

Second was a 260-day ritual calendar, used to coordinate religious celebrations, feasts, and markets or, when cojoined with the solar calendar, to invoke prophecy. The origin of the 260 numerical count has never been fully understood, but indigenous peoples who continue to use it in parts of Guatemala and Oaxaca believe that its rough equivalence to nine months represents the period of human gestation. The 260-day calendar was therefore fundamental to religious ideology.²

The ritual calendar was constructed using two continuous counts, one of thirteen numbers and the other of twenty day signs. Each ran simultaneously through its proper sequence and then started over

² Frank J. Lipp, *The Mixe of Oaxaca: Religion, Ritual, and Healing* (Austin: University of Texas Press, 1991); Duncan Maclean Earle and Dean R. Snow, “The Origin of the 260-Day Calendar: The Gestation Hypothesis Reconsidered in Light of Its Use among the Quiche Maya,” in *Fifth Palenque Round Table, 1983*, ed. Virginia Fields (San Francisco: Pre-Columbian Art Research Institute, 1985), 241–44.

again. The total number of uniquely identifiable days then became 13 times 20 or 260.³ Over a period of two thousand years, varying day sign symbols were applied by different societies; but the numerical coefficients of between one and thirteen almost always remained the same. Each day sign had a specific supernatural patron and was ascribed a positive or negative quality. Specially trained priests were taught to use the ritual calendar to divine the fate of a person born on a particular day, as well as to determine what days were auspicious for performing certain types of activities, from arranging royal marriages to waging wars.









































The Princeton bone fragment is engraved with calendrical day signs in a Nahua-Mixteca style named for the two culture groups that were primarily responsible for its conception.⁴ During the Postclassic period, 1100–1521 C.E., this representational art style, composed of highly conventionalized symbols, was widely adopted throughout central and southern Mexico. In full figurative form, the style was primarily employed to convey historical or ritual narrative; but certain symbols could also be reduced to simple icons that symbolized either an idea or a spoken word.

By 1300 C.E., the Nahua-Mixteca style had supplanted earlier pictographic and phonetically based scripts employed by the Classic period civilizations of La Mojarra, Teotihuacan, Cacaxtla, Xochicalco, Monte Albán-Nuiñe, and to some extent even the Maya. There is considerable evidence that the new system was adapted from figurative symbolism used to ornament elite artwork in precious metals, stones, wood, bone, shell, ceramics, and textiles, as well as wall murals. Far from representing any decline in literacy, the adoption of this new pictographic style instead demonstrates an ingenious response to the redistribution of power among Postclassic confederations of petty city-states and great houses, whose leaders communicated in as many as twelve different languages.⁵

³ Alfonso Caso, *Los calendarios prehispánicos*, Universidad Nacional Autónoma de México, Instituto de Investigaciones Históricas, Series de Cultura Náhuatl, Monografías, 6 (México, 1967), and Caso, “Calendrical Systems of Central Mexico,” in *Handbook of Middle American Indians*, vol. 10, *Archaeology of Northern Mesoamerica*, pt. 1, ed. Gordon Ekholm and Ignacio Bernal (Austin: University of Texas Press, 1971), 333–48.

⁴ John M. D. Pohl, “Nahua Drinking Bowl with an Image of Xochiquetzal,” *Record of the Art Museum, Princeton University* 63 (2004), 40–45.

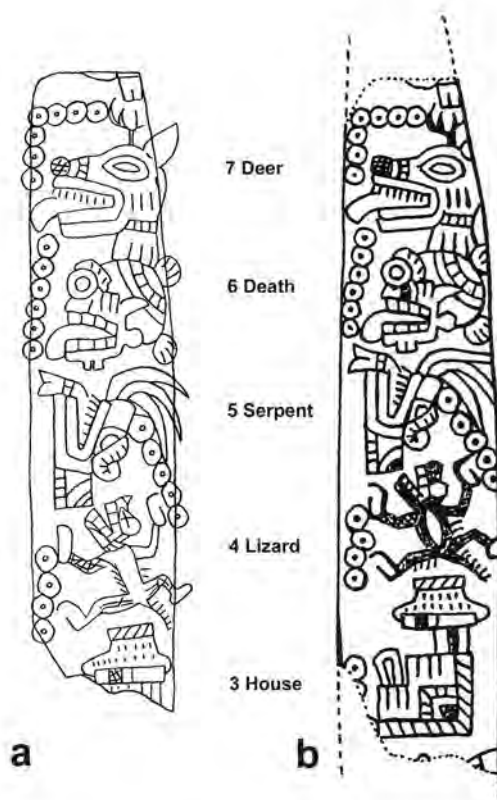
⁵ Pohl, “Royal Marriage and Confederacy Building.”

Classic Zapotec	Postclassic Nahuatl	Classic Zapotec	Postclassic Nahuatl
Chilla 	 Crocodile	Loo 	 Monkey
Laa 	 Wind	Pija 	 Grass
Laala 	 House	Laa 	 Reed
Lachi 	 Lizard	Lache 	 Jaguar
Zee 	 Serpent	Naa 	 Eagle
Lana 	 Death	Loo 	 Vulture
China 	 Deer	Xoo 	 Earthquake
Lapa 	 Rabbit	Lopa 	 Flint
Niça 	 Water	Lape 	 Rain
Tela 	 Dog	Loo 	 Flower

3. The Zapotecs are credited with devising the earliest 260-day divinatory calendar sign system known for Mesoamerica. The writing system persisted until the Postclassic period, at which time the Zapotecs adopted a Nahuatl-language-based symbol system even though they persisted in employing the traditional Zapotec-language names. Illustration by John Pohl and Javier Urcid.

Evidence of the profound influence that the Eastern Nahuas had on the Zapotecs and Mixtecs, not to mention others they more directly dominated (like the Popoloca), is found in the appropriation of a significant part of the day sign system displayed on the bone. The Zapotecs actually devised Mesoamerica's earliest calendar sign system and shared it with the Mixtecs up until the end of the Classic period, around 800 c.e. For the most part, the day signs employed are identifiable as symbols for words in the Zapotec or Mixtec language.⁶ But after 1300 c.e., both the Zapotecs and the Mixtecs employed the Nahuatl-based symbol system. The effectiveness of pictographic communication was apparently such that it seemed not to bother either group to do so; they simply continued to apply their own terminology for the signs (fig. 3).

⁶Javier Urcid Serrano, *Zapotec Hieroglyphic Writing*, Studies in Pre-Columbian Art and Archaeology, 34 (Washington, D.C.: Dumbarton Oaks Research Library and Collection, 2001).



4. (a) Drawing of the Princeton bone, illustrating the sequence of day names for the first trecena (thirteen days) of the 260-day divinatorial calendar. Illustration by Javier Urcid. (b) Drawing of the bone made by José L. Franco Carrasco (1968) prior to its accession by the Princeton University Library, illustrating the missing portion of the day sign “House” and portions of three numerals.

The day signs engraved on the Princeton bone are read from bottom to top (fig. 4a). Only a portion of the first sign survives, and it might have been difficult to identify; but fortunately, a drawing of the bone made prior to its arrival at Princeton indicates that the sign is a representation of a royal palace and therefore symbolizes the day sign “House.” Portions of three circles signifying numerals also survive (fig. 4b).⁷ The next sign in the sequence is a small creature facing

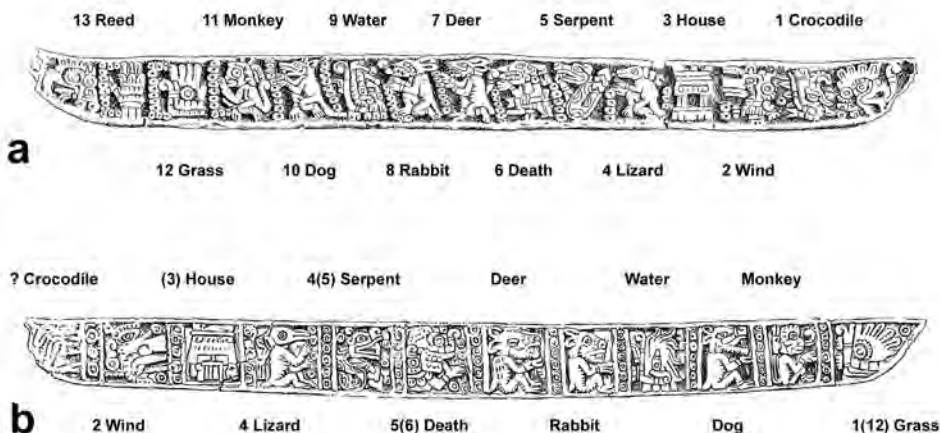
⁷The drawing was made by José L. Franco Carrasco, *Objetos de hueso de la Época Precolombina*, Cuadernos del Museo Nacional de Antropología, 4 (México: Instituto Nacional de Antropología e Historia, 1968).

upward with four legs outstretched; it signifies the day sign “Lizard.” A series of four circles signifying the numeral 4 appear adjacent to the lizard. The third sign is more easily identifiable as the head of a snake, symbolizing the day sign “Serpent.” It is associated with five numerals. The fourth sign is composed of a skull signifying “Death,” with six numerals. At the top appears the day sign “Deer,” with seven numerals. The interpretation of the sequence is straightforward. By consulting a standard table of the 260 day signs, we see that the first full trecena (subdivision of thirteen days) and the second (which contains the remaining seven of the twenty day signs) consist of the days:

<i>First Trecena</i>		<i>Second Trecena</i>	
1 Crocodile	8 Rabbi	1 Jaguar	8 Crocodile
2 Wind	9 Water	2 Eagle	9 Wind
3 House	10 Dog	3 Vulture	10 House
4 Lizard	11 Monkey	4 Earthquake	11 Lizard
5 Flint	12 Grass	5 Flint	12 Serpent
6 Death	13 Reed	6 Rain	13 Death
7 Deer		7 Flower	

The engraving on the bone clearly depicts the third, fourth, fifth, sixth, and seventh days of the first trecena. We can presume that if the entire bone had survived, it would have featured the first two days—1 Crocodile and 2 Wind at the lower end—and the subsequent six days up to 13 Reed at the upper end.

Confirmation that the Princeton bone once included an entire sequence of the first trecena is found on an artifact excavated at Monte Albán, the ancient Zapotec capital. Dating to at least as early as 500 B.C.E., Monte Albán was constructed on a thirteen-hundred-foot-high mountain that was leveled over time to create an enormous ceremonial and civic center that ultimately covered some twenty-five square miles. In 1931, the pioneering Mexican archaeologist Alfonso Caso broke through the masonry floor of a palace patio to discover Tomb 7 and the largest horde of gold, silver, and precious stone jewelry ever discovered in Mesoamerica. Because metallurgy was widely practiced in Mesoamerica only after 1100 C.E., three centuries following Monte Albán’s abandonment as a Classic period capital, Caso speculated



5. (a) Bone 172i from Tomb 7 at Monte Albán. (b) Bone 203 from Tomb 7 at Monte Albán. Illustrations by John Pohl after Alfonso Caso.

that later Zapotec and Mixtec royal families who were intermarried at that time reused the sepulchre during the Late Postclassic.⁸ Careful analysis of carved bones also found in the tomb confirmed his hypothesis. They were executed in the Nahuatl-Mixteca style, and Caso was able to decipher much of the symbolism by comparing them with the iconography appearing in surviving Postclassic screenfold books, called *codices*.

Shaped like a miniature weaving batten, Bone 172i carries a series of signs carved laterally across its surface (fig. 5a). Beginning on the right-hand side, it is possible to identify the day sign “Crocodile” together with one numeral. The next sign features the mask of the wind god Ehecātl, signifying the day sign “Wind,” together with two numerals. The sequence then plays itself out in much the same way as that portrayed on the Princeton bone, except that it features the entire *trecena* sequence.

A second bone found at Monte Albán, Bone 203, also presents a complete sequence of day signs. The sequence runs horizontally from left to right. The first day sign is difficult to identify but could be “Crocodile.” The sequence then runs in order through the twelfth day sign, “Grass.” Only a few of the day signs possess numerals, but it

⁸ Alfonso Caso, *Tesoro de Monte Albán*, *Memorias*, 3 (México: Instituto Nacional de Antropología e Historia, 1969).

is not at all clear whether they are meant to run in sequence through the first trecena or whether they mark a series of special feast days invoked from throughout the entire 260-day count (fig. 5b).

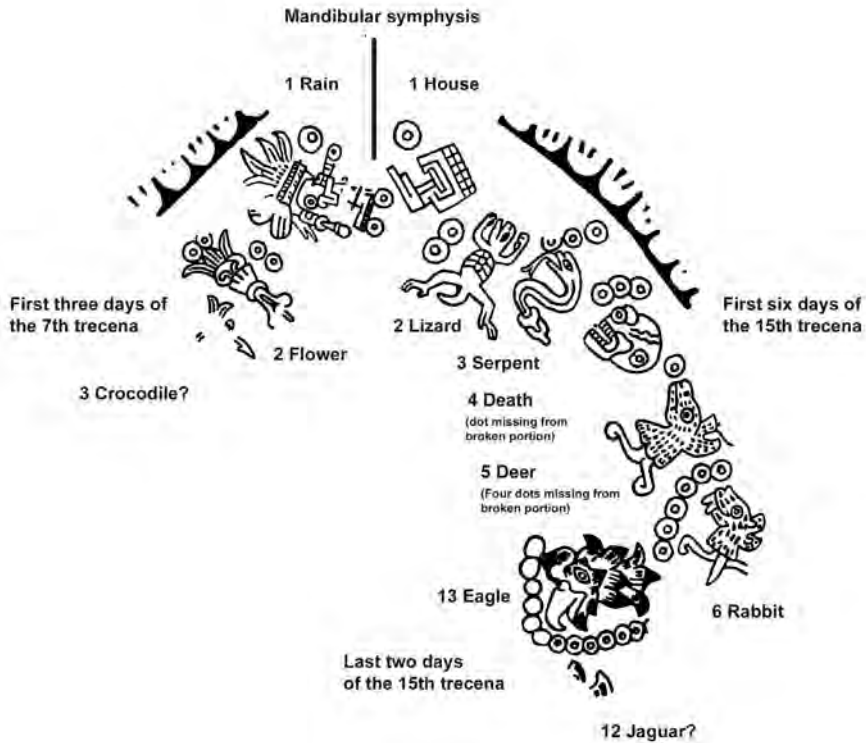
Finally, a fourth object relevant to this discussion of calendrical counts on carved bone is a fragment of the mandible of a manatee preserved in the Museum für Völkerkunde in Vienna (fig. 6).⁹ A sequence of symbols on the mandible invokes what appear to be the first three days of the seventh trecena, the first six days of the fifteenth trecena, and the last two days of the fifteenth trecena, indicating that religious practitioners could use bone instruments for more complex forms of divinatory ritual than simply a symbolic invocation of the calendar by the depiction of the first trecena alone.

The identification of calendrical systems carved on objects like the Princeton bone is directly relevant to an ongoing debate concerning the division of the categories of knowledge preserved in the codices. Some scholars have proposed that there is little or no cultural distinction between codices belonging to the Mixtec Group and those assigned to the Borgia Group. Rather, the differences in content and format simply reflect a variance in Mixtec intellectual application analogous to the contemporary use of religious histories on the one hand and horoscopes on the other.¹⁰ The Mixtec Group, it is argued, is “descriptive”; in other words, the screenfolds describe historical events that actually took place in the past and will never recur again. The Borgia Group on the other hand is “prescriptive”; in other words, the screenfolds anticipate events that may take place at some time in the future. Such pan-Mixtec-oriented arguments are made by codex specialists who focus solely on iconographic and stylistic similarities among codices and ignore contextually related material in ceramics, frescos, and other artifacts, such as the Princeton bone and the associated objects discussed here.

It can now be demonstrated conclusively that the division between the two screenfold groups is cultural and that they represent equivalent forms of sacred texts employed by the Mixtec-dominated

⁹See Karl Anton Nowotny, “Americana II,” *Archiv für Völkerkunde* 16 (1961), 105–43.

¹⁰John M. D. Pohl, “Screenfold Manuscripts of Highland Mexico and Their Possible Influence on Codex Madrid: A Summary,” in *The Madrid Codex: New Approaches to Understanding an Ancient Maya Manuscript*, ed. Gabrielle Vail and Anthony Aveni (Boulder: University Press of Colorado, 2004), 379.



6. Day signs carved on a manatee mandible preserved in the Museum für Völkerkunde, Vienna. Illustration by Javier Urcid after Karl Anton Nowotny (1961).

confederacies of Oaxaca on the one hand, and the Eastern Nahuadominated confederacies of Tlaxcala, Puebla, and possibly adjacent parts of Veracruz on the other.¹¹ It seems that the Mixtecs expressed theological and religious preferences that differed in symbolic usage from the Eastern Nahuas of Puebla and Tlaxcala with whom they were otherwise intermarried and with whom they shared the Nahuamixteca style.¹²

If the difference between the Mixtec Group and the Borgia Group is cultural, how can we rationalize their usage as intellectual equivalents in two different elite cultures, given the apparent emphasis on

¹¹ *Ibid.*, 379–80.

¹² John M. D. Pohl, “Ritual and Iconographic Variability in Mixteca Puebla Polychrome Pottery,” in *The Postclassic Mesoamerican World System*, ed. Michael Smith and Frances Berdan (Salt Lake City: University of Utah Press, 2003), 171–75.

history in the former and divination in the later? Codex Borgia (Vatican Library), for example, clearly fits Nahua descriptions of books used to calculate prophecies, such as the future of a child born on a specific day or the outcome of an important event. Granted, it is difficult to conceive of a “prophetic” usage for a Mixtec codex like Zouche-Nuttall (British Museum) outside of planning marriages. However, Oaxacan ethnohistorical sources do not refer to the use of books in this fashion. Rather, they describe prophecy as an activity carried out with alternative instruments, such as corn kernels, stick bundles, or a deer hide painted with the day sign. The Quichés, Mixes, and Zapotecs continue to use comparable instruments today. The fact is, there is nothing that necessitates the use of a codex to prognosticate or lay out the divinatory calendar. The same ends could be achieved with carved bones devices.

We cannot determine just when the tradition of engraving animal bones with meaningful designs began in Mesoamerica. Aside from a single find from the Valley of Mexico—a 22,000-year-old bone fragment that portrays the superimposed images of a mammoth and a large cat—there is little to suggest any North American comparison to the widespread bone and ivory carving traditions, much less the sophisticated calendrical calculations, associated with the European Upper Paleolithic. A few carved bones are known for Mesoamerica’s Classic period, having been recovered from Maya royal tombs. For the most part, they feature narrative scenes commemorating the deeds of gods and kings, and some even feature hieroglyphic texts.

The Princeton bone is significant, therefore, not only because it is unique but also because it represents an important contribution to a growing body of evidence on the nature of calendrical ritualism in southwestern Mexico, the accompanying rituals for which are still practiced in parts of Mesoamerica today.