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CONTRIBUTORS TO THIS ISSUE

STEPHEN ARON is Professor of History at UCLA and Executive Director of the Institute for the Study of the American West at the Autry National Center, Los Angeles. Among his many publications are How the West Was Lost: The Transformation of Kentucky from Daniel Boone to Henry Clay (1996) and American Confluence: The Missouri Frontier from Borderland to Border State (2005).


DANIEL M. COBB is Assistant Professor of History at Miami University in Oxford, Ohio, and former Assistant Director of the D’Arcy McNickle Center for American Indian History at the Newberry Library in Chicago. His first book, Before Red Power: American Indians & the Politics of Tribal Self-Determination, 1960–1968, is forthcoming from the University Press of Kansas.

ANN FABIAN teaches American Studies and History at Rutgers, the State University of New Jersey, in New Brunswick. She is the author of Card Sharps, Dream Books, and Bucket Shops: Gambling in Nineteenth-Century America (1990) and The Unvarnished Truth (2000), a study of personal narrative. She is working on a book on skull collectors.
Mick Gidley holds the Chair of American Literature at the University of Leeds, England. In 2005 he was the William Robertson Coe Distinguished Visiting Professor of American Studies at the University of Wyoming. He has published widely in American literary and cultural history, most recently *Edward S. Curtis and the North American Indian Project in the Field* (2003). Currently, he is completing a study of the little-known photographer Emil Otto Hoppé.

Owen Luck is a working photographer whose images are in the collections of the Princeton University Library and Yale University Library. His current project concerns the Makah people of Neah Bay in Washington State.

Julie L. Mellby is the Curator of Graphic Arts in Princeton University Library’s Department of Rare Books and Special Collections. Before coming to Princeton, she was curator of works on paper for the Toledo Museum of Art and associate curator of graphic arts for the Houghton Library, Harvard University. Recent publications include *Splendid Pages: The Molly and Walter Bareiss Collection of Modern Illustrated Books* (2003).

John M. D. Pohl is the Peter Jay Sharp Curator and Lecturer in the Art of the Ancient Americas, Princeton University Art Museum. An eminent authority on North American Indian civilizations, he has directed numerous archaeological excavations and surveys in Canada, the United States, Mexico, and Central America as well as Europe. His many books and articles on the ancient civilizations of Mesoamerica include *Exploring Mesoamerica* (1999) and *The Legend of Lord Eight Deer: An Epic of Ancient Mexico* (2002).

William S. Reese is an antiquarian bookseller in New Haven, Connecticut, specializing in Americana, travel, and natural history. He is an authority on nineteenth-century American color-plate books and the author of articles and exhibition catalogs on early American imprints and the American West.

Paul C. Rosier is Assistant Professor of History at Villanova University, where he teaches Native American history, American environmental history, American women’s history, and

**Martha A. Sandweiss** is Professor of American Studies and History at Amherst College, where she teaches Western American history, public history, and visual culture. She has a particular interest in how visual images can serve as historical documents. Her most recent book, *Print the Legend: Photography and the American West* (2002), has won many awards, including the 2002 Ray Allen Billington Prize from the Organization of American Historians for the best book in American frontier history.

**Heather A. Shannon** is a project cataloger in the Cotsen Children’s Library of the Princeton University Library. From September 2004 to January 2006, she cataloged almost 7,000 individual photographs, photograph albums, and photograph collections housed in the Princeton Collections of Western Americana.

**Anton Treuer** (Princeton Class of 1991), a member of the Leech Lake band of Ojibwe, is Associate Professor of Ojibwe and director of the Ojibwe language program at Bemidji State University in Minnesota. He is editor of the only academic journal on the Ojibwe language, *Oshkaabewis Native Journal*, and has published *Living Our Language: Ojibwe Tales & Oral Histories* (2001) and *Omaa Akiing* (2002), an Ojibwe-language collection of tales from Leech Lake elders.

**Javier Urcid** is an anthropological archaeologist interested in the role of ancient literacy on the formation and maintenance of social complexity, in modeling the origins and alternative developments of writing systems, and in methods of semantic and phonetic decipherment of extinct scripts. His main research focuses on Mesoamerican scribal traditions. His work on Otomanguean scripts (500 B.C.E.–1600 C.E.) includes *Zapotec Hieroglyphic Writing* (2001).
A Zapotec Carved Bone

JOHN M. D. POHL
AND JAVIER URGID 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. 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. Zapotec engraved bone. At its tallest and widest points it measures 8.9 x 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.
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 Nahua-Mixeica 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.

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.

again. The total number of uniquely identifiable days then became 13 times 20 or 260. 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. 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-Nuñe, 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 Pohl, “Royal Marriage and Confederacy Building.”
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. 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).

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.

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). The next sign in the sequence is a small creature facing...
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:

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

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
that later Zapotec and Mixtec royal families who were intermarried at that time reused the sepulcre during the Late Postclassic. Careful analysis of carved bones also found in the tomb confirmed his hypothesis. They were executed in the Nahua-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 Ehecatl, 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

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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.

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). 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. 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

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confederacies of Oaxaca on the one hand, and the Eastern Nahua-dominated confederacies of Tlaxcala, Puebla, and possibly adjacent parts of Veracruz on the other.\textsuperscript{11} It seems that the Mixtecs expressed theological and religious preferences that differed in symbolic usage from the Eastern Nahua of Puebla and Tlaxcala with whom they were otherwise intermarried and with whom they shared the Nahua-Mixteca style.\textsuperscript{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

\textsuperscript{11} Ibid., 379–80.

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 Zapotecos 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.