Research Articles

Oldest Writing in the New World

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A block with a hitherto unknown system of writing has been found in the Olmec heartland of Veracruz, Mexico. Stylistic and other dating of the block places it in the early first millennium before the common era, the oldest writing in the New World, with features that firmly assign this pivotal development to the Olmec civilization of Mesoamerica.

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Several writing systems are known from pre-Columbian Mesoamerica, most with dates after the first millennium before the common era (BCE). (1) Previously, no script has been associated unambiguously with the Olmec civilization, in many respects the progenitor of all later complex societies of Mexico and adjacent Central America (2). Recent proposals for late Olmec writing at La Venta, Tabasco, Mexico, rest on two categories of object, roller-seal iconography and isolated, discontinuous incisions, neither sure to be script (3). We report here on an Olmec serpentine block incised with a previously unknown script, the earliest known thus far in Mesoamerica and, by extension, the Western Hemisphere. The Cascajal block and the script on it link the Olmec to literacy, document an unsuspected writing system, and reveal a new complexity to this civilization, including the possibility of information tools not hitherto known in this early period. The discovery of an ancient writing system is a rare event, so unusual as to deserve global attention (4–6).

Site description. The Cascajal block was first seen by M.C.R. and P.O.C. in April 1999, when local authorities requested that inspectors from the Instituto Nacional de Antropología e Historia (INAH) of Mexico come to the municipality of Jáltipan, Veracruz, to examine objects taken from a local gravel quarry in the ejido (communal lands) of Lomas de Tacamichapa (Fig. 1). This context is described in a paper by M.C.R. and P.O.C. (7). For some years, the quarry, an archaeological site that offered ready building material, had supplied fill for road construction. The site is labeled Cascajal and consisted of two parallel mounds, both defining an open area sealed off by two other mounds. A visit in May 2006 by M.C.R. and P.O.C. showed that the surface of the mounds was Classic period in date (late first millennium CE) but with earlier materials underneath. Cascajal was fully intervisible with the salt dome to the south that supports the large Olmec center of San Lorenzo (8).
The local authority for cultural materials, Cástulo Gabriel Cruz, who now cares for the block under INAH registration in the community of Lomas de Tacamichapa, reported that the block came from debris heaped to the side of a destroyed area, 40 m by 50 m in extent and 2.5 m deep, at the southwestern limits of the site. During the destruction of the mound from which the serpentine block came, a number of ceramic sherds, clay figurine fragments, and broken artifacts of ground stone were collected by the local workmen, and since that time have been safeguarded in the house of C. G. Cruz. These were examined and photographed in 1999 by M.C.R. and P.O.C. and again in 2006 by all of the present authors. About three-fourths of these materials are Formative in date, and of these, all but two or three sherds of the Formative period can be positively identified as belonging to the San Lorenzo phase (uncalibrated 1200 to 900 BCE). The anomalous sherds of the Formative period are of the Palangana phase, contemporary with the principal occupation of the Olmec site of La Venta, Tabasco (calibrated 800 to 400 BCE), but a very minor component at San Lorenzo, the largest site close to Cascajal. There appear to be no Late Formative ceramics. All of the remaining artifacts consist largely of Fine Orange ceramics as well as associated types that can be ascribed to the Terminal Classic Villa Alta phase (CE 800 to 900), almost 1800 years after the date of ceramics recovered from Cascajal. Villa Alta occupation is widespread throughout the Coatzacoalcos drainage and covers some major Olmec sites, including San Lorenzo and Laguna de los Cerros. It seems probable, therefore, that the block, and its incising, can be dated to the San Lorenzo phase, perhaps toward the end of San Lorenzo B, that is to say, about 900 BCE. This dating is in agreement with the Olmec iconography that must have given rise to this script in the first place.

**Features of the block.** Carved of serpentine, the Cascajal block weighs about 12 kg and measures 36 cm in length, 21 cm in width, and 13 cm in thickness (Figs. 2 and 3). It displays five slightly convex sides. The remaining side shows the text, which consists of 62 signs. Scrutiny of this surface shows variable patina, vestiges of local orange clay, and the workings of two blades: one blunted and thus ideal for outlines, the other sharper to make incisions within signs. Unpatinated areas were highlighted by image processing in Adobe Photoshop CS (Adobe Systems Incorporated, San Jose, CA); other, unprocessed images are made available here as supporting online material. Enlargements of the high-resolution photos, taken with a Canon EOS 20D SLR (Canon, Tokyo, Japan) camera in raw format at 23.45 Mbytes per file, show unmistakable weathering, including pitting over incisions, with mineralization around the pits and inside the carved lines, a secure sign of ancient surface alteration. This was confirmed by 20× magnification and mineralogical analysis courtesy of Ricardo Sánchez Hernández and Jasinto Robles Camacho of the Laboratorio de
Geología, INAH. In ancient times, the surface of the block had been carefully ground to prepare for the incised text, possibly as an erasable document that could be removed and revised.

**Text analysis.** The Cascajal block conforms to all expectations of writing (Figs. 4 and 5) (9). The text deploys (i) a signary of about 28 distinct elements, each an autonomous, codified glyphic entity; (ii) a few in repeated, short, isolable sequences within larger groupings; and (iii) a pattern of linear sequencing of variable length, with (iv) a consistent reading order. As products of a writing system, the sequences would by definition reflect patterns of language, with the probable presence of syntax and language-dependent word order (10).
Text orientation is clear. Olmec imagery consistently displays vegetal icons, which sprout to the top. The appearance of such signs in the text demonstrates that the inscription is horizontal. This orientation is further supported by the disposition of "sky-band" elements much like those on Olmec thrones and later regional iconography. Reading order is more difficult to establish. Most Mesoamerican scripts read left to right in unmarked conditions, i.e., when not arranged in unusual architectural settings. Left to right is likely to be present here, too. Yet, there is no strong evidence of overall organization. The sequences appear to be conceived as independent units of information, although to judge from shared details of carving they were recorded by the same hand.

The signary is likely to be incomplete. Three signs appear four times, six appear thrice, 12 occur twice, and seven occur once. The Cascajal block has three two-part sequences: sign 4 plus sign 1; sign 17 plus sign 8; and, perhaps, sign 3 plus sign 19. One sign, of an apparent insect positioned as though scaling upward, faces its body to the direction of reading. It clearly opens sequences. In the shorter sequences, signs do not repeat. This is not the case with the two longest sequences at the base of the text. The chance of deciphering Olmec writing, that is, of linking it to language, is low. The sample is small, correlations to explanatory imagery are absent in the Cascajal block, and the restricted number of signs, although pointing by their small quantity to an alphabet, is potentially a meaningless statistic. With new finds there remains a strong chance of notable increments in the signary, as has proved true for the undeciphered Isthmian writing found not far from Cascajal (11). It is evident that some of the signs have an iconic origin, a few more transparent than others. The paired sets of eyes in signs 24 and 25 suggest the facial markings seen on some Olmec celts of the Middle Formative period [figure 44 in (12)]. Several paired sequences, such as the eyes or a throne sign paired with an evident mat sign, both common tropes for rulership in Mesoamerica, point to poetic couplets that are otherwise well attested in formal discourse of the region [figure 11 in (13), (14)]. If valid, the Cascajal examples would illustrate the earliest known couplets in Mesoamerica, a feature not yet seen in other Olmec icons. Signs 12, 17, and 27 show a thematic preoccupation with maize, or at least the ready use of such signs in the creation of a signary. Sign 6 may be a skin; sign 8, a strung bead or plaque; sign 10, a dart tip; sign 16, an object shown grasped in Olmec iconography; sign 18, a bivalve; sign 20, a possible perforator; and sign 21, a vertical fish. As for dating, iconographic parallels indicate that the Cascajal block is best assigned to the transition
between the Early and Middle Formative period (1000 to 800 BCE). Signs 12, 16, and 20 appear in Early Formative graphs of San Lorenzo, but sign 1, with cleft element and inverted V motif, serves as a diagnostic element of Middle Formative imagery [figure 12 in (15)]. Similar signs occur on figurines at Cantón Corralito, Chiapas, Mexico, but even earlier, at 1150 to 1000 BCE in uncalibrated dates [figure 3 in (16)]. The Corralito finds are especially relevant. They were excavated after the recovery of the Cascajal block, lending further weight to the general dating and validity of the text.

The significance of the find depends on whether more examples can be recovered and whether these can be salvaged by archaeologists rather than road builders, as regretfully occurred at Cascajal. It is probable that the Tlaltenco Celt and possibly the Humboldt Celt, both from Mexico, record the same script, also disposed in horizontal sequence [figures 32 and 34 in (17)]. The discovery of a rich inventory of wooden sculptures nearby, at El Manati, of slightly earlier date, suggests that a dearth of texts today may be misleading (18). A tradition of coeval woodworking suggests an ancient reality of abundant wooden inscriptions, of which few would survive in tropical conditions. The small number of texts in Isthmian writing, found also in Veracruz as well as into Chiapas, Mexico, proves that a robust, widely spread script could exist without leaving many examples that last to the present.

The position of the Cascajal block in the development of New World writing, and particularly in Mesoamerica, is difficult to establish. The Cascajal script bears no secure links to later Isthmian writing, which has a quite distinct signary although also from Veracruz, nor to other writing systems of Middle Preclassic Mesoamerica. The dating of the block to the Early Formative–Middle Formative transition raises the possibility that its writing system is: (i) an isolate, devised locally, with no known successors or (ii) a widely spread script that disappeared before the advent of scripts across Mesoamerica in the middle of the first millennium BCE. The first view hints that the Cascajal block conforms to the domain of "shamanic" scripts devised by religious specialists, with tightly restricted, revelatory functions and limited use-span (19). Against this view is the clear linkage of the script to the widely diffused signs of Olmec iconography. The signs and sequences of the Cascajal block savor of widespread codification, not shamanic idiosyncrasy. The dating of the Cascajal block and its formal distinction from all later scripts mean that the trajectory of the Cascajal system recalls the obsolescence experienced by Indus script at about 1900 BCE, with scriptural silence until the far later introduction of a script from the Near East and intervening regions (20). These and other questions relating to content and function cannot be resolved until more examples of the Cascajal script are found.

References and Notes

21. Access to the Cascajal block was facilitated by members of the Patronato Prodefensa del Patrimonio Cultural Lomas de Tacachichapa, Cástulo Gabriel Cruz, President. The Centro Regional, Veracruz, of the INAH made the visit possible. J. Clark and D. Cheetham commented on the manuscript, as did several anonymous reviewers. Z. Nelson helped prepare figures.