IZAPA: CULTURAL HEARTH OF THE OLMECS?

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Located near the edge of the Pacific coastal plain in the far southeastern corner of Chiapas, Mexico, is the large pre-Columbian ceremonial center known as Izapa. Situated on the terrace of a small stream tributary to the Rio Suchiate, the border river between Mexico and Guatemala, the site consists of more than 130 mounds sprawled over several hectares of lush tropical lowland at the base of the volcano Tacaná, the second highest mountain (4,094 meters) in Central America. Although scarcely half a dozen of Izapa's cobble-studded mounds and pyramids have been restored to date, it is clear that they once formed part of an elaborate, well-planned complex of considerable magnitude and importance. Just how important this complex may be is only now emerging.

Archeologists have tentatively assigned Izapa to the Late Formative Period (corresponding roughly to 600-100 B.C.), primarily on the basis of stylistic evidence (Bernal, 1969, 127). There is, nevertheless, good reason to believe that Izapa is far older than such evidence would suggest. Indeed, Bernal concedes that Izapa may be synchronous with the oldest known Olmec sites at San Lorenzo and La Venta (Bernal, 1969, 173). It has been shown, for example, that a settled, village way-of-life was in existence in the region of Izapa possibly as early as 1500 B.C., judging from the radiocarbon dating of finds at Ocós, on the coast of Guatemala just forty-five kilometers away (Bernal, 1969, 127). Additional evidence, admittedly circumstantial, has been provided recently as a result of the author's identification of Izapa as the birthplace both of the Mesoamerican calendrical systems and of the knowledge of magnetism among the region's pre-Columbian cultures,

During field studies in Mexico early in 1973, the author was led to conclude that the peculiar 260-day sacred almanac which was used throughout Mesoamerica in pre-Columbian times was based on the interval between vertical sun positions - two astronomical fix-points which are readily identifiable by any society living in the tropics. An interval of such a length can only be found in the northern hemisphere along a narrow band just south of the 15th parallel of latitude, and only in the winter half-year. Thus, the southward transit of the vertical sun takes place at this latitude on August 12-13, and its northward passage occurs on the following April 30-May 1. Although earlier researchers had noted that the southward transit of the vertical sun coincided with the hypothetical beginning date of the Long Count system (i.e. August 13, 3113 B.C.), they had concluded that the calendar was a Mayan creation, having been devised at Copán, which lies precisely at this latitude in western Honduras (Bernal, 1969, 94). However, the present author found it necessary to reject this hypothesis for two reasons, one historical and the other geographical. The historical objection stems from the fact that Copán was founded too late for the calendar to have originated there, for Morley maintained that the oldest evidence of dated monuments at that site go back only to A.D. 465 (Morley, 1946, 59), while the sacred 260-day almanac was clearly a product of the pre-Christian era. The geographical objection relates to the environmental associations of the types of fauna

used as day-names in the almanac, many of which are of tropical lowland origin. Copán, on the other hand, is situated in the uplands at an elevation of 600 meters where animals such as the alligator, monkey, and iguana are not found. Indeed, although the 15th parallel of latitude crosses the entire width of Guatemala and Honduras, it does so everywhere in relatively high, mountainous terrain and only near the coasts of the Pacific and the Caribbean does it traverse lowland areas. Whereas the Caribbean lowland of Honduras is remote and virtually uninhabited, the narrow Pacific lowland of Mexico contains the Late Formative ceremonial center of Izapa, which meets both the historical and geographical prerequisites perfectly.

It has long been assumed that the 260-day sacred almanac must have predated the recognition of the true length of the tropical year, for once the 365-day interval had been discovered there would have been little reason to conjure up any other measure of time. On the other hand, once the 260-day period had been sanctified in use as a religious almanac, it would have been virtually impossible to jettison following the discovery of the 365-day year. Thus, the two time-counts, one religious and the other secular, would have been used concurrently from that time forward.

Early in 1974, during field studies at Izapa, the author discovered the principle that Olmec priests appear to have used in determining the true length of the tropical year. Although the site of Izapa, as noted above, is oriented to the volcano Tacaná, the second-highest mountain in Central America, the author noted that the region's highest peak, the volcano Tajumulco (4,220 meters), lies at an azimuth of 65º from the ceremonial center. This azimuthal relationship is precisely that of the rising sun at the summer solstice. Thus, it was possible for a priest standing atop the main pyramid at Izapa not only to calibrate accurately the length of the sacred 260-day almanac, but also, by counting the number of days which elapsed between consecutive sunrises over the highest mountain in Central America, the true length of the tropical year as well.

Using the highest mountain within sight as a solsticial marker was a "principle" which would have been readily apparent at Izapa where the massive cone of Tajumulco rises only 32 kilometers away. Such an idea, however, would have been far less likely to have emerged if the mountain in question were a considerable distance away, for the relationship of site to sun position would not have been so apparent. It could also be argued that such a principle would have been more readily appreciated at a ceremonial center where a conscious measurement of time was already underway, as would have been true had the sacred almanac been set in motion at Izapa as hypothesized. Yet, once such a principle had been discovered, it is, like the sacred almanac, not likely to have been abandoned easily. Indeed, orienting one's ceremonial center to the highest topographic feature in sight even may have become a religious necessity, with the sun-god himself in effect dictating where the sites of his worship should be located. In any event, the author has found that more than forty of the oldest Mesoamerican ceremonial centers were oriented in just such a manner, including the classic Olmec sites of San Lorenzo and La Venta (paper in press). Because both of the latter are oriented to mountains over 130 kilometers away, it would seem that the "principle" was learned from some earlier center of diffusion where the relationship would have been more obvious.

Also, because the older of these two centers has been dated back to at least 1200 B.C., it would appear that both the sacred and secular calendars were in use before this time.

Although many attempts have been made to establish the dates on which the Mesoamerican time-counts began, they have been largely discredited by scholars such as Thompson who maintained that they had no astronomical origins (Thompson, 1960, 98). Yet, if the author's hypotheses are correct, then two astronomical fix-points can be established against which to test the one precise date bequeathed to us by the Mayan chronologists - and presumably the Olmecs before them. This is the date selected as the origin of the Long Count system, equated as August 13, 3113 B.C. by the Goodman-Martínez-Thompson correlation. Elsewhere (in press) the author explains how he determined that the Long Count system - a fusing of both the 260-day religious almanac and the 365-day secular calendar - would appear to have been devised in 235 B.C., a date originally suggested as early as 1930 by Teeple but likewise discounted by Thompson (Thompson, 1960, 152). Encouraged by the knowledge that he had reached independently the same conclusion as an earlier scholar whom Thompson had lauded for his mathematical 'brilliance' in other connections (Thompson, 1960, 225), the author employed a computer to 'run back' both the secular and sacred calendars to their starting points. For the secular calendar this meant that a day known to the Mayas as "0 Pop" should coincide with the summer solstice, whereas for the sacred almanac a day called "1 Imix" should coincide with August 13. As a result of this operation, the author has shown that the secular calendar probably dates from June 21, 1323 B.C., and that the sacred almanac traces its origin to August 13, 1358 B.C. Significantly, both dates are entirely in accord with the radio-carbon determinations from the Ocós area south of Izapa and from the San Lorenzo area of Veracruz state, which was presumably one of the first Olmec sites into which the calendrical "principles" diffused.

Had Izapa served solely as the birthplace of Mesoamerican calendrics that would have been reason enough to regard it as a major cultural hearth amongst the Olmecs. However, in at least one other field of knowledge Izapa seems to have been in the vanguard of Olmec learning as well, namely terrestrial magnetism. For some time, researchers have believed that the Mayas were aware of magnetism, apparently using it to align the structures in their major ceremonial centers (Fuson, 1969, 494). Then, in 1973, Coe discovered a small bar of polished hematite at San Lorenzo that he assumed may have been used as part of a compass. Found in a layer dated to approximately 1000 B.C., this suggests that the Olmecs were aware of magnetism about a millenium before the Chinese (Carlson, 1975, 753). However, during field work at Izapa in January, 1975, the author discovered evidence that the inhabitants of this site not only knew about magnetism but that they also seem to have associated it with the homing instinct in the sea-turtle. Such a conclusion stems from the fact that a large sculpture of a turtle head, located about thirty meters to the southeast of the main pyramid, has been carved from a basaltic boulder rich in magnetic iron and executed with such precision that all the magnetic lines of force come to focus in the turtle's snout. Although no other magnetic stones have been found at Izapa, there are at least two other representations of the turtle present at the site. One of these is a sculpture near the east wall of the main pyramid which has the shape of an upturned turtle shell and which, when filled with water during

the rainy season, may have provided a frictionless surface on which to float a needle or sliver of lodestone. The other is a large altar in the form of a turtle at the west end of the ceremonial ball court, in whose north wall is embedded a carving of a bearded man standing in a boat moving across the waves. That the Izapans were a sea-faring people and maintained relatively regular contacts with places as far distant as Ecuador over a long period of time has been shown by the similarities in ceramics found in the two areas (Coe, 1966, 45; Badner, 1972, 24). That they should have failed to observe the great migrations of east Pacific Ridleys moving between Baja California and Ecuador or of the black turtle which migrates between the Guatemalan coast and the Galápagos Islands while on such voyages is quite inconceivable (Carr, 1967, 136, 216). And that they should have been impressed by the sureness of the turtle's navigational ability and compared this to the direction-finding property of the lodestone would have taken no great leap of imagination. Whether Izapa's maritime connections included trans-Pacific contacts cannot be demonstrated at this point, though Meggers, among others, has presented striking evidence of similarities between the Olmecs and the Shang-dynasty Chinese (Meggers, 1975, 17). In any event, it would appear that Izapa served as a major center of cultural innovation in Mesoamerica, whether as a trans-Pacific bridgehead or as a hearth in its own right.

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(This article was originally published in the PROCEEDINGS OF THE ASSOCIATION OF AMERICAN GEOGRAPHERS, 1976, pp. 32-35.)

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