OLMEC SCULPTURES OF THE HUMAN FETUS

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The human figure as a subject has intrigued sculptors since Paleolithic times. Humans have represented the different stages of life from infants to corpses and skeletons. In sculpture around the world, individuals have been portrayed with marked physical differences, such as dwarfism and polydactylism. Similarly, many ontological states have been explored in sculpture, ranging from youthful innocence to drunkenness, spiritual ecstasy, painful suffering, sexual arousal, and transformation into an animal or vegetal state. But one aspect of human life has not been widely identified in the corpus of world art: that of the prenatal stage, that is, the fetus.

Heretofore, the earliest known image of an accurately defined human fetus was the celebrated drawing by Leonardo da Vinci, probably dating to the early 16th century, and the earliest known sculpture of the developing human was an 18th-century piece intended for medical instruction [1, 2]. However, recent research into the sculpture of the ancient Olmec of Mexico resulted in a preliminary identification of certain Olmec stone sculptures as being representations of fetuses, carved between 900 and 600 BC [3]. Pursuing this tentative identification, we involved several specialists in

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The authors wish to thank Lewis Held, Department of Biology, Texas Tech University, and the following physicians: Arthur E. Gordon, Jay M. Sivitz, Jan J. Volin, Neil Nghia Tran, Bernard Siegel, and Jack Fitzsimmons. Librarians whose guidance is very much appreciated include Margy Grasberger, Lynda Sadusky, Judy Baker, and Anita Fahringer. The authors also wish to thank Brian Stross, Department of Anthropology, University of Texas at Austin, for his suggestions and for comments on an earlier draft, and Rebecca González Lauck, who allowed them to examine the monumental fetuses at La Venta.

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0031-5982/99/4203-1101$01.00
an analysis of the Olmec sculptures and performed a survey of illustrations of prehistoric and historic art in cultures worldwide. Based on these investigations, we propose that the earliest images of the human fetus were made in Formative Period Mexico, more than 2,000 years prior to Leonardo’s anatomical study. To our knowledge, few cultures documented their exploration of human development in art, a situation which raises several questions about the roles of scientific and medical knowledge in different cultures and about Euro-American attitudes toward our own fetal development.

During research for an exhibition of Olmec art, we had the opportunity to examine firsthand hundreds of Olmec sculptures and to study photographs of even more. We realized that over a dozen representations of an unusual and poorly identified anthropomorphic subject existed. Instead of the 1:5 head-to-body ratio typical for most stone adult human figurines, this group had deeply flexed legs and a head-to-body ratio of about 1:3 or 1:4. These proportional ratios are not normal for adult humans, but they are for a fetus of 12 to 30 weeks (see Fig. 1) [4]. Similarly, the flexed-leg convention of the sculptures replicates precisely how the fetus adapts itself to the space of the womb. These characteristics prompted us to explore the possibility that the sculptures might represent fetuses.

Previous interpretations of several of these sculptures has been published in exhibition and collection catalogues and archaeological site reports, in which they had been called “dwarfs,” “crouching figures,” and “dancers” [5–8]. A few closely observed naturalistic images of dwarfs do exist in Ol-
mec art, and they are well known due to the wide publication of a single jadeite figure of a dwarf (which has sometimes been erroneously called a “jaguar baby”) excavated at Cerro de las Mesas [9]. However, the distinct category of sculpture we observed does not possess the proportions of adult or fetal dwarfs.

As a study sample, we isolated a group of 21 anthropomorphic sculptures which did have the 1:3 or 1:4 head-to-body ratio and deeply flexed legs. We were able to obtain clear photographs of only 16. Three others are monumental sculptures from La Venta, Tabasco, for which we do not have permission to publish photos or drawings. The other two are small pieces in private collections in Mexico, but adequate photos of them are unavailable. From this group we excluded all representations of adult dwarfs and hunchbacks, as well as the fantastic being thought to represent a supernatural in Olmec ideology, the so-called Olmec “were-jaguar”—whose salient features include a body only twice the size of the head, with slanting almond-shaped eyes and a deep V-cleft in the head (such a being is held by the adult in Fig. 2).

Once we had identified this group of similar sculptures, available analytical methodologies were few. Since the people of Formative Period Mexico (1200 to 400 BC) did not engage in writing, there are no contemporaneous texts that could label or identify these sculptures. Furthermore, although linguists have partially reconstructed several languages spoken by Formative Period Mexican cultures, terms for fetus are not available at this time. Even if they were, they would not provide a secure identification of the sculptures in the absence of contextualizing oral narrative or written document. We have assessed the scant available archaeological information on the treatment of fetuses and neonates who died or were sacrificed in the Formative Period. We provide this here, along with a discussion of the archaeological contexts in which Olmec fetus sculptures were recovered at the site of La Venta, thus yielding some cultural context for attitudes toward the fetus. However, in terms of direct evidence for our identification of the sculptures as fetuses, we are limited to comparative morphology.

We tested the hypothesis that the Olmec created accurate images of perinatal infants by inviting a group of 11 obstetricians, gynecologists, neonatologists, perinatologists, and an embryologist to scrutinize independently the photographs of the 16 sculptures.1 The consensus was that the sculptures were employed because the actual objects are in public and private collections in various countries. Authenticity of objects not retrieved archaeologically is always an issue. However, 10 of these sculptures have been in public collections for decades and are indubitably authentic. Two in private collections had been published prior to *The Olmec World*. Since these had been in the public eye for many years, there had been ample opportunity to resolve any doubts about their authenticity. Four were unpublished prior to *The Olmec World* exhibition, but their authenticity has not been questioned. Prior to our identification of these as fetuses, they were merely odd little carved stones, not a highly recognizable subject likely to be produced by forgers.
Fig. 2.—Standing adult holding Olmec supernatural, unknown provenience. Jade; H: 21.9 cm. Collection to Robin B. Martin, on loan to Brooklyn Museum. Photo: Copyright Justin Kerr.
did indeed represent human fetuses or possibly neonates. More specifically, all participating specialists agreed that the Chiapas sculpture (see Table 1) represents a human fetus of 20 to 24 weeks. As we indicate in Table 1, the majority of physicians agreed that the other figures were fetuses also, although a small minority did not distinguish fetuses from newborns. The embryologist considered that all 16 represent fetuses. These experts disagreed with the previously mentioned art historical and archaeological interpretations of the figures as dwarfs but noted several other abnormalities, which are indicated in the Table. In order to visually compare these sculptures with human fetuses of 18 to 23 weeks, see Figure 3.

Additionally, we compared these images to published photographs of fetuses in a wide array of medical texts and to the specimens of preserved fetuses of known age at the Mütter Museum in Philadelphia. These comparisons confirmed the results of inspection by the 11 scientists. To the 20th-century observers, the parallels between the Olmec sculptures and actual fetuses are startlingly precise, so much so that experts were able to identify a gestational age represented by the sculptures, as well as specific anomalies observed in actual fetal development. While such visual comparison does not provide conclusive evidence for identifying the sculptures as fetuses, it does allow a working hypothesis that can be further tested as new approaches arise. If these sculptures do represent fetuses, then they appear to be the earliest such subjects.

To determine the extent of visual and written documentation of the fetus among early civilizations, we reviewed more than 400 books and innumerable journal articles on the subjects of world art from the prehistoric era to about AD 1500, when the previously mentioned first accurate drawing of a fetus was made by Leonardo da Vinci. Regardless of an extensive tradition of knowledge directly or indirectly relating to the fetus, there are no visual images other than Olmec ones until a manuscript dating from the 9th to the 12th centuries AD (Moschion Codex 3701–3714, Royal Library, Brussels, and Codex 1653 in Copenhagen). Rather than working from direct observation of a fetus, the creator of this image in the Moschion Codex was content with illustrating children two to eight years of age standing in a flask-like uterus with arms outstretched and in other sprightly positions [10, 11]. This same approach, that of illustrating the homunculus, was used in The Female Anatomical Figure, a woodcut of 1491 by Johannes de Ketham, in Venice, in which appears a representation of a baby of one to one and a half years in utero [12]. Leonardo’s rendering (British Royal Library 19102r [K and P 198]), done between 1511 and 1513, is of an eighth-month fetus; however, the placenta is ungulate rather than human [1]. A more complete catalogue of fetal representations is the embryological atlas De Formato Foetu, published about 1600 by Fabritius ab Aquapendente, the Paduan anatomist [13]. It is possible that other representations of fetuses exist that we have not found, or that have not been identified as such.

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<td>transparent skin, toe and finger nails, ear spools, avian-dragon pelt</td>
<td>A “flying” fetus, defined by the extended or hyper-extended head; each observer stated this “unequivocally represents a fetus”</td>
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<td>7</td>
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<td>Unknown, 6 cm, private</td>
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<td>17.</td>
<td>Mexico</td>
<td>OWR&amp;R Cat. 116</td>
<td>20.6 cm</td>
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<td>Gulf Coast</td>
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<td>7.</td>
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<td>OWR&amp;R Cat. 118</td>
<td>9 cm (broken)</td>
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<td>14.</td>
<td>Mexico</td>
<td>OAAM(^2) p. 123</td>
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<td>If newborn, it has macrocephaly or hydrocephaly; not a dwarf</td>
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<td>16.</td>
<td>Unknown</td>
<td>OAAM Cat. 64</td>
<td>19.1 cm.</td>
<td>Not a dwarf</td>
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<td>4.</td>
<td>Mexico</td>
<td>Amparo Mus., Puebla, Mex.</td>
<td>9 cm</td>
<td>Not a dwarf</td>
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1 This is the number of physicians and biologists out of a total of 11 stating that the sculpture represents a fetus rather than a newborn. The remaining number of physicians were undecided as to whether the figure represented a fetus or a newborn. The biologist thinks that all are fetuses.
2 The Olmec World: Ritual and Rulership.
3 Museum of the American Indian, Heye Foundation.
4 National Museum of Anthropology, Mexico.
5 Olmec Art of Ancient Mexico.
6 Dumbarton Oaks Research Libraries and Collection, Washington, DC.
However, to the best of our knowledge, except for the Olmec figures we present here, no earlier accurate image of a fetus exists prior to Leonardo’s drawing and no sculpted image until the 18th century, when such images were made as demonstration models for medical instruction.

Despite the lack of pictorial representation, concern with fetal development is demonstrated in the texts of many ancient civilizations. Numerous ancient texts indicate knowledge about abortions, such as the Egyptian Ebers papyrus of about 1550 BC, which lists substances known to terminate pregnancy [14]. Some deliberate abortions were performed in Mesoamer-
ica. However, since the fetuses depicted in Olmec art seem not to have been products of abortion, we will not recap this abundant information here. It is relevant, however, to review those aspects of fetal development which engaged the attention of early writers. Anomalies and teratological “monstrosities” were subjects in Mesopotamian omen texts dating from the Old Babylonian Period, about 1900 to 1600 BC to the time of the Library of Nineveh in the seventh century BC [15]. The cuneiform omen series *Summa Ezbu* describes such conditions as ectopia cordis, imperforate anus, agnathia, polydactyly, and ambiguous sex [16]. Interest in the normal fetus appeared in the Indian Garba Upanishad (“Secret Teachings on the Embryo”) of about 500 BC, which indicated, albeit erroneously, that the head of the fetus appeared in two months, the feet in three months, vertebrae in five, and nose, eye, and ears in six months [17]. In the west, Galen’s book *On the Formation of the Fetus* recognized, among other features, the foramen ovale and ductus arteriosus, and the 3rd century AD Talmud provided terms for stages of fetal development: *golem* (for the first six weeks), *shefir merkkan*, “when the eyes are like the two dots of a fly,” *ubbar* (until the fourth month), *welad* (until the seventh month), and then *welad shel kaymo* (viable child) [18–20]. From Mesoamerica, we found one report on contemporary Tzeltal Mayan terminology for fetal development, which was elicited from a young man whose degree of acculturation into Ladino society of Chiapas was considerable. From the time of conception to the moment of birth, the fetus is called “accompanying the mother.” In early stages, the embryo is said to have the “form of a baby rat,” however, once it takes on human form, “it begins to move” and the *ch’ulel* or “spirit/soul enters it.” The next phases are called “it begins to make sounds like hiccups,” then “it begins to cause pains.” Finally, “it drops” and “it is born” [21]. However, since the standards and goals of Mesoamerican cultures likely were not those of our scientifically oriented society, these works did not describe the anatomic, ontogenic, or metamorphic features with which we identify or illustrate the developing human. We realize, similarly, that the Olmec did not share our modern scientific aims. What, then, prompted their cultural focus on depicting the fetus?

Our usage of the term *Olmec* refers to the various peoples in Mexico and Central America, who, between about 1200 and 400 BC, produced skillfully crafted objects that conformed to a coherent system of subject matter, sculptural format, and formal qualities. These ancient peoples once lived in the modern Mexican states of Veracruz, Tabasco, Puebla, Morelos, Oaxaca, Chiapas, and Guerrero, as well as in Guatemala, Belize, and El Salvador. They did not all speak the same language but communicated certain ideas by means of visual representation of humans and other subjects in portable stone carvings. This interaction was especially intense during the Middle Formative Period, about 900 to 600 BC, the period in which the fetus effigies were likely produced. Despite the fact that the Olmec of the Gulf Coast
states of Veracruz and Tabasco were the earliest makers of monumental stone sculpture in the Americas, most scholars are unaware of the actual range of intellectually sophisticated subjects in this artistic tradition. Also, the small-scale stone sculptures have drawn less scholarly attention than have the impressive monumental stone sculptures, which take the form of colossal heads and enormous blocky thrones depicting humans emerging from cave-like niches, among other subjects. The fetus is one of a limited number of human subjects among Olmec stone figurines.

Recent art historical analysis demonstrates that the Olmecs portrayed the normally developed adult human figure in only four positions (with some variations). There are dozens of figures in a very specific standing pose: with knees slightly flexed, spine very straight, and arms relaxed in a pose of standing meditation. Only about six figures have been found that exhibit the straight spine, crossed legs, and hands resting on thighs of a typical seated meditation position. (A smaller percentage of standing and seated figures are not in these meditative postures.) About 10 kneeling figures represent a human with zoomorphic features, signaling human-animal, or shamanic, transformation [22]. The fourth category of Olmec stone figurines, with four known examples, consists of the unlikely position of resting on the chest and elbows with both feet on the head in a yogic contortion. Since the standing, seated, and ‘‘contortionist’’ positions are all well-known postures of physical and spiritual discipline, and the kneeling figures are engaged in shamanic transformation, it seems that the Olmec practiced these specific postures to achieve a state of spiritual transformation through body-mind discipline [23]. Taken together, the poses of Olmec figures apparently form a primer of ‘‘corporeal facts’’ about their ritual practices and reveal the shared physical, political, and spiritual human experiences that constitute a major element of Olmec ideology.

The only other categories for the human figure in small-scale three-dimensional stone sculpture are hunchbacks, dwarfs, and the much more numerous examples of the fetus. In terms of their proportions, detailed anatomical features, and poses, fetus sculptures are the most naturalistic images in Olmec stone figurines. Most images of adults are stylized, in that the proportions are about 1:5 (head to body ratio) instead of the normal 1:7. Fetus sculptures tend not to have the slender face, aquiline nose, and downward-arching fine lips of the ‘‘idealized’’ Olmec adult (see Fig. 2), instead exhibiting more naturalistic facial features (see Fig. 4). A high degree of modeling is present on those fetuses rendered in fine-grained stone (Figs. 5, 6, 7, 8). For example, on Figure 5, note the careful attention to the swelling and folds around the eyes, the chin, the bony protrusion of the clavicle, the subtle shapes of muscles in the upper arms and legs, and the rendering of cuticles and fingernails. In contrast, most adult stone figurines exhibit stylized shapes for the limbs, little attention to definition of bony or muscular protrusions, and an idealized face. The greater degree
Fig. 4.—Fetus effigy with head tilted back and raised arms, of unknown provenience. Stone. Amparo Museum, Puebla. Drawing: G. Bendersky.

of naturalism sculptors used in their portrayal of fetuses is puzzling; perhaps their intention was to describe specifically a stage of human development rarely seen.

In addition to their naturalistic proportions, several of the figures possess specific details of anatomy found in fetuses. On many of the sculptures (see especially Fig. 9), the carver portrayed the incompletely articulated structure of the ears observable up to around the 20th week of fetal development. Another feature that may be portrayed is cutaneous pellucidity. Between 15 and 25 weeks, veins can be seen beneath the skin [4]. The sculpture illustrated in Figure 5 is fashioned from a light greenish-gray albitite which seems to have a waxy, or translucent, surface or skin. The figure is incised on the top of the head and down the back with fine lines, into which the original fill of red cinnabar has been recently replenished. Thus the incised lines on this particular stone appear to suggest this stage of visibility of the veins beneath the fetus’ skin. However, it should be noted
that Olmec sculptors frequently incised designs on figures, and that the presence of incising does not always allude to this prenatal stage. Or if it does, then all incising on Olmec figures should be understood as a reference to the fetal side.

Agnathia or micronathia is the most obvious congenital abnormality visible in some of the sculptures (Figs. 10, 9, 11, 12, 13). Since fetuses have such a large head-to-body ratio, all the images have relatively large heads; however, macrocephaly is probably depicted in Figures 11, 14, and possibly in 10, 15, and 16. These abnormalities may be symptomatic of the congenital anomalies that led to the premature births and deaths of the fetuses. Most of the fetus effigies are portrayed with outsized feet. Since in most cases the hands are normal sized for a perinatal, we think that rather than large feet being a naturalistic rendering of an abnormality, they were simply an artistic device used by the sculptor to create a stable standing figure.

Despite the fact that some exhibit congenital abnormalities, the overall attitude of the figures is one of vitality. The fetus effigies are not recumbent or helpless as one would expect of a newborn. Instead, they are animated, taking positions they could achieve while in the womb. Many of the effigies seem to support or touch their heads with their hands. In another common position, the effigies have arms crossed over their chests (Fig. 17). One
has a hand cocked at its ear, as if intently listening (Fig. 18). As 20th-century viewers, we wonder how the Olmec knew about the position of the fetus in the womb. It is possible that a midwife could have identified with her hands on the mother’s belly the position of the head and limbs. But the detail of facial features and musculature seen in some effigies and the portrayal of congenital anomalies suggest that the sculptors observed actual fetuses that spontaneously aborted, and perhaps lived briefly. This must have happened multiple times, because each figure is unique; none is a copy of a single original. Furthermore, the sculptures were made in differing varieties of stones and were found in diverse parts of Mesoamerica. Each sculptor may have modeled his figure after a specific fetus at the same time that he drew upon knowledge of fetal positions in the womb,
and worked within a larger visual canon and a cultural tradition in which
the fetus played a variety of related roles.

Contemporary viewers of Olmec art who lack medical training have ob-
jected to the identification of these figures as fetuses based on the fact
that some have hair, pierced ears, or adornments. However, in actual fetal
development, fingernails are present at 24 weeks, the eyes are open and
hair is well developed at 28, and toenails are present at 30 weeks [4]. The
pierced ears, earspools, incised iconography, and sacks carried by some
fetuses are clearly not natural but cultural items, probably added by the
sculptors to help illustrate the significance of the fetus’ ritual roles. The
piercing of ears and wearing of earspools is associated with high status indi-
individuals in Mesoamerican culture. Two of the figures (Figs. 5, 7) are incised with the pelt and head tufts of the Olmec Dragon in its avian aspect [24]. The Olmec representation of this supernatural creature gave form to the powers inherent in the sky and earth and was associated with shamans. Two or three figures wear a helmet (Figs. 15, 14, possibly 16). The three highly eroded monumental fetuses at La Venta also wear helmets. Similar helmets are worn by the well-known colossal heads thought to depict Olmec rulers, possibly in their role as ritual ballplayers. A final cultural attribute of the sculptures is a fiber sack carried on the back of two of the fetuses (Figs. 7, 16). A symbol indicating the contents of the sack on Figure 7 is incised on the figure’s back, above the mouth of the sack: it is a maize kernel. All these features—specific headgear, earspools, the Olmec Dragon and by extension the Olmec cosmos, and planting maize—are associated with Olmec shamanic rulers and therefore provide the fetal figures with political-religious status.

Although we realize that the original significance of the sculptures can never be fully recovered, we summarize here the published data regarding the fetus from archaeological and ethnographic reports in order to define ideological parameters within which inferences may be made regarding
possible motivations for the creation of these expressive objects. Archaeological evidence concerning the treatment of premature, stillborn, or aborted infants is very scarce. However, some recent finds offer tantalizing clues regarding the culturally constructed roles and ritual importance of fetuses. Investigations at the site of El Manatí, Veracruz, revealed that in about 1200 BC, a ritual deposit of at least 37 wooden busts of idealized human figures was placed in a region of fresh and saltwater springs at the foot of a hill [25]. Cached with certain wooden busts were jade celts; with others, stone scepters; with others, small piles of stones precious to the Olmec; and scattered over some were the disarticulated femurs and skulls of several newborns or fetuses. One wooden bust covered a complete primary burial of a neonate or fetus [26]. The fetuses could have been taken from women who died during pregnancy or in childbirth. Alternatively, since some of the skulls showed signs of cuts, it is possible that at least those infants had been sacrificed. No adult bones were associated with the ritual

Fig. 9.—Agnathic fetus effigy from Guerrero. Stone. National Museum of Anthropology, Mexico. Drawing: C. Tate.
deposit of the wooden busts, so the inclusion of neonates was a deliberate ritual act. At another Formative Period site across the mountains in western Mexico, Teopantecuanitlan, burials of neonates or possibly fetuses (along with a dog, possibly to act as guide for the young spirit) were also recovered in an altar outside the northwest corner of the ceremonial precinct [27].

The context in which the sculptures were used, or at least finally deposited, provides an important clue to their significance and is especially valuable information in the absence of written texts. The only small-scale fetus effigy which has been recovered archaeologically was found at La Venta, Tabasco, Mexico. There, figurines representing humans were among the thousands of crafted semiprecious stone objects deposited in spatially significant arrays below the surface of the ceremonial courtyards [28]. The fetus effigy (Fig. 19) is one of 30 stone human figurines. It was cached with three other figurines, two of which depicted children and one a dwarf, near
what appeared to be a burial of a small child [8]. This cache was located on the central, 8 degrees west of north axis of the bilaterally symmetrical site. Perhaps this was La Venta’s manner of memorializing the birth and death of perinatals or infants of important lineage.

The largest scale fetus sculptures in Olmec art are the three placed on Structure D-7 at the south end of La Venta’s approximately north-south axis. They were discovered during the first Euro-American exploration of the site in 1925 [29]. The three sandstone sculptures, each about 7 feet tall, represent a human figure with deeply flexed legs and arms upstretched to support a very large head, possibly helmeted. Archaeologist Rebecca González Lauck of the Instituto Nacional de Antropología e Historia de
México, in charge of the current excavation of La Venta, notes that “[t]he location and position of this sculptural group seems to reflect that of the three colossal heads that Stirling (1940) discovered in the northern part of the zone. In both cases, the sculptures mark the principal area of the city, perhaps signaling the main entrances” [30]. Since the spatial placement of sculpture at La Venta seems to have been an important aspect of its significance, it might be that a ritual procession starting from the three fetuses in the south through the major portion of the site to the three colossal heads in the north was intended to create a narrative of growth, transformation, and development of kings.

Given that most major subjects of Olmec stone figurines depict either
the inner mind-body transformation of meditation or an external shamanic transformation from human to animal state, the characteristic metamorphosis evident in the developing fetus makes it a potent symbol of such a process. In examining a spontaneously aborted embryo of less than nine weeks, an Olmec person would have observed a tiny, tailed being that looked like a fish or tadpole (or baby rat, as the contemporary Tzeltal Maya say). The embryonic stage of development may be represented in Olmec art by the jade “spoons,” which have been interpreted as representing tadpoles (Fig. 20) [31]. From the 9th to the 12th week, human features develop and the proportions change from nearly 1:2 to 1:3 ratio of head to body. Thus, while the Olmec shaman engaged in the mystical conversion of his human body to a zoomorph, every human fetus appears to undergo a similar albeit reverse pattern of transformation. It is tempting to conclude that the Olmec shaman may have identified the embryonic human resemblances to reptile species with the principle of Olmec spiritual transformation. This suggests a reciprocal form of the 18th- and 19th-century Euro-American concept that ontogeny summarizes phylogeny [32]. Accordingly, the importance of the embryo and fetus in Olmec art may have represented the metamorphic parallelism of phylogenetic interchange through the embryonic-fetal transition with shamanic transformation.

Such parallels are fundamental to the signification of abstract concepts in Mesoamerican thought and art. Most Mesoamerican people consider human beings to be like the maize plant. The Mayan creation story, told in the 16th-century Quiché book, *Popol Vuh*, states that the present race of
humans was made from cornmeal ground by the Divine Grandmother and mixed with the water with which she rinsed her hands, which became human blood [33]. The metaphoric identification of the maize plant with the human being is well documented in the Popol Vuh and elsewhere. We propose that the development cycles of both were also considered parallel. In Mesoamerica, the human gestation cycle and the life cycle of maize are both socially constructed to be 260 days, which is also the number of days in the supremely important “ritual” year and is practically equivalent to nine lunations. The 260-day calendar is divided into 13 cycles of 20 distinctly named days. Contemporary Mayan Tzeltal speakers divide the maize cycle into identical periods, in which specific activities are performed. In the first 20-day period, they prepare the earth; the second is for planting; in the third they anticipate rain to germinate the maize; in the fourth, the sun warms the soil; in the fifth, roots develop indicating seed is fertile; in the sixth, the spirit of maize enters (100 to 120 days, or about 14 to 17 weeks; the quickening of the fetus in the womb is known to occur as early
as 14 to 16 weeks, although it is often later). In the seventh, kernels appear in a housing and the immature ear “wakes up”; in the eighth, the immature edible ear, *jilote*, forms and can be picked for food; in the ninth, the *jilote* matures and there is a first fruits celebration; in the 10th (180 to 200 days, or 25½ to 28½ weeks), the plant stops growing as its fruit is mature, the silk darkens, dries, and dies, and the principal ear is picked; in the 11th, kernels continue to ripen and ears are harvested; in the 12th, seed kernels dry out and the stalks are folded. In the 13th, the seed kernels continue drying for full harvest [34]. Clearly this process has been elongated to occupy a full 260-day period.
Fig. 16.—Fetus effigy holding bundle of maize plants with raised arms, of unknown provenience. Basalt; 19.1 cm. Brooklyn Museum. Photo: Brooklyn Museum.
This socially constructed parallelism between the rapid growth and transformation of human fetuses and maize helps explain the maize seeds and seed sacks incised on two of the fetus sculptures. It is widely recognized that maize iconography, primarily in the form of sprouting plants, frequently appears in Olmec art [35]. Maize seeds were drawn as tapering vertical rectangles or ovals, cleft on the upper side. Maize is a monocot: its sprout is a singular leaf, and sprouting maize seeds often appear incised on jade celts (which themselves represent maize), emerging from the cleft heads.
of Olmec “supernaturals” and on the headbands of rulers [36]. Thus, the selection by the Olmec of the sprout of maize as its principal symbol and their emphasis on the “sprout-phase” or fetus of a human point to a particular fascination in the developmental stages of life, in which the most dramatic and rapid transmutation occurs.

The question remains as to what the Formative Period Mesoamericans intended to symbolize with the fetus sculptures. Were they used as “milagros”—as visual prayers for a successful birth? If so, why did some of the fetuses have deformities? Did they memorialize particular individuals, or serve as repositories for their spiritual essences? Were they substituted for live offerings in sacrificial caches and burials? Was the depiction of an essential developmental phase of human life considered to encourage formation of viable crops of maize in this early agricultural society? As new souls, were they seen as messengers from the “otherworld,” a celestial or chthonic plane of existence? Or did a fetus effigy serve as a powerful symbol of the
physical and spiritual transformative capacity of the human being? If so, how was this drama played out?

Review and Discussion

Our perusal of ancient artifacts and texts suggests that knowledge regarding fetal development among the ancient Egyptians, Mesopotamians, Indians, Europeans, and Semitic cultures was inaccurate relative to current descriptive standards until the advent of empirical science in Italy in the late 15th century. However, a group of Olmec sculptures dating between 900 and 400 BC testifies to an unusually advanced knowledge of fetal development. We have documented here the scientific opinion that a category of Olmec stone figurines previously thought to represent dwarfs or another unknown subject instead represent human fetuses and/or neonates. Some of the sculptures are effigies of apparently normal fetuses and some were
given visible deformities, but all are naturalistically designed and were likely produced subsequent to observation of actual fetuses.

If the Formative Period Mexican peoples represented the human fetus in sculpture, possibly other cultures did so as well. However, if they were among the few to memorialize the fetus, we wonder why the fetus has not been a symbol of transformation in any other society. Have most human cultures been uncomfortable with the non-human appearance of a human embryo? Does the family’s grief at the death of its potential infant preclude...
the desire to learn about the development of the young being? Is such a
death considered sinful, or dangerous to the mother or family, or is the
fetus considered too sacred for scrutiny? This apparently widespread hu-
aman avoidance of studying the spontaneously or deliberately aborted fetus
seems to point to the concept that being human is ideally a static state,
subject to growth and decay but not to radical shifts in form.

In constrast with a possibly widespread notion of the static nature of hu-
man existence, most Olmec stone figurines seem to represent humans in
a state of physical or spiritual transformation. The characteristic metamor-
phosis evident in the developing fetus, from “tadpole” or “fish” to human,
makes it a potent symbol of such a process. In fact, among the Mixe, con-
temporary descendants of the Olmecs, the female supernatural power who
controls bodies of water also controls human childbirth and fishing, as if
one “fishes” for children, or as if fish were placed in the womb in order
to be transformed—“cooked”—into human infants [37]. Similarly, the
fetus parallels the life cycle of maize, the quintessential Mesoamerican sym-
bol of the miracle of life. Both undergo dramatic transformation, the fetus
apparently from “lower” to “higher” animal and the maize from seed to
graciously upright fruiting plant to seed again.

Viewed from the modern scientific viewpoint, the Olmec made preco-
cious studies of human anatomy. In addition to fetuses, they also made
the first anatomically correct representation of a human heart [38]. Neither
fetuses, hearts, nor meditative postures were as accurately portrayed by later
Mesoamerican cultures, although the 260-day count, the belief in the equiv-
ance of humans and their principal cultigen, maize, and many other Ol-
meq Concepts form the foundation of Mesoamerican thought. However, in
Mesoamerica, the empirical knowledge of anatomy and also the advanced
astronomical knowledge for which the cultures are well-known were not
amassed to reduce the material world to a series of “facts,” but served to
situate life processes in complex, dynamic temporal cycles.

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YARDSTICKS

To measure ordinary days
Requires stars—
The firelight of years
Across some finite, starless space.

But how to gauge this day of ours?
The yardstick of the stars
Will not suffice
For motions of the heart—
Its heat, its ice—
For these, the measure of the mind
And half of our eternity will do.

Will do, perhaps, to start.

Harry P. Kroiter