CARVED CHLORITE VESSELS: A Trade in Finished Commodities in the Mid-Third Millennium

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In 1967 a small survey team from the Peabody Museum, Harvard University located a large prehistoric mound, Tepe Yahya (or Hill of John), in southeastern Iran roughly halfway between the provincial capital of Kerman and the port city of Bandar Abbas. Excavations at the site commenced in 1969 and a cultural chronology for the area was slowly devised and refined over the succeeding five field seasons. The periodization at Yahya, which modified sequences from more limited excavations at Bamur, Tal-i Habis, and Shah-i-d, helped place the earlier surface discoveries of Sir Aurel Stein within a temporal framework and, through the establishment of rare diagnostic parallels with material from further west, linked the relative chronology of eastern Iran to the more precise, 'absolute' scale of southwestern Iran and Mesopotamia. We can summarize the periodization at Tepe Yahya as follows:

Two section drawings illustrate the critical subdivisions for the long and complex period IV. The first shows the main twenty-meter wide section from the south side of the mound; it was in this area that the initial step trenches were excavated and, when extended, that a large complex IVc structure containing early proto-Elamite tablets was unearthed. The second section shows the sequence obtained from the mound's northern side; small (4x10 meter) trenches were opened in this area during the summer of 1970 to verify the cultural sequence established during the first two seasons. The correspondences between the northern and southern sides of the mound were close, though there were significant differences in the earliest periods (VI, VC) and period IVB. The final season, scheduled to begin summer 1975, plans to connect the sides and establish precise stratigraphic correlations between them. For our present purposes, it is sufficient to note that the positioning and character of period IVB1 on both north and south sides, as well as from a limited sounding on the top of the mound excavated in 1973, are remarkably similar.

VI
Coarse Wares Neolithic
ca 4500-4000 B.C.

VC
Coarse Wares and Bilchome
ca 4000-3800 B.C.

VB
Yahya Period "Black on Buff"
ca 3800-3600 B.C.

VA
Yahya Period "Black on Red"
ca 3600-3200 B.C.

IVC
Proto-Elamite Period
ca 3200-2900 B.C.

Gap (?)

IVB2
Proto-Elamite Period
ca 2800-2600 B.C.

IVB1
Proto-Elamite (?) Period
ca 2600-2500 B.C.

IV-A
Old Elamite (?) Period
ca 2400-2000 B.C.

Gap

III
Iron Age
ca 1000-500 B.C.

II, IIA
Achaemenian
ca 500-300 B.C.

Gap (?)

I, IIA
Partho-Sassanian
ca 100 B.C.-A.D. 400
We are chiefly concerned with the occurrence of elaborately carved stone vessels, produced in period IVB1 at Tepe Yahya, that have exact parallels to objects from Mesopotamia, southwestern Iran, the Persian Gulf, and east as far as the Indus Valley, but it is important to note that the dominant small find from every period at Yahya is made from the same soft, dark green stone, chlorite. Each period has its distinctive chlorite assemblage. In the earliest periods tiny, flat, circular beads, rough, open vessels, so-called "arrow-straighteners" (probably used as braces for the manufacture of the beads), and stylized figurines are carved of chlorite. In the later periods, particularly II-1, spindle-whorls or buttons and fathe-turned vessels, frequently decorated by a series of partially drilled, dot-circle designs, characterize the chlorite assemblage. But if the breakdown of chlorite utilization is examined more precisely, it becomes apparent that chlorite was most extensively worked during period IVB1. The figure showing histograms representing the number of chlorite fragments/estimated area excavated through 1973 per period clearly illustrates the dominance of chlorite utilization during IVB1 times. Differences among the other periods can be detected and may be significant, but in general, a pattern of the domestic utilization of a locally available resource, chlorite, characterizes the entire Yahya sequence with the exception of production in period IVB1. It is only during period IVB1 that countless waste chips and flakes have been found on the rough, unpainted surfaces characteristic of the period. Their occurrence conclusively demonstrates that the actual production of chlorite artifacts took place on the mound itself and their abundance suggests that this production was large-scale. The exceptional "take-off" of the IVB1 chlorite industry must be explained as the result of a shift from production dominantly for use to the production of commodities primarily for purposes of exchange.

In the summers of 1971 and 1973 I explored the mountains ringing the Soghun Valley. My reconnaissances were aided by geological maps, kindly provided by the Geological Survey of Iran, and the invaluable directions and information obtained from native guides. Large zones of serpentine and glaucophane schist containing numerous chlorite outcrops surround the valley to the north and west and in three separate areas extensive surface quarrying of chlorite was evident. Unfortunately, there was no way to date these strip or surface 'mines', and tombstones in the valley had been carved from chlorite as recently as thirty years ago. A careful examination of the geological map of the area also confirmed that two small serpentinitized zones of ultrabasic rocks occurred immediately west of the Soghun Valley within a roughly 20-25 minute walk from Tepe Yahya. A small limestone cave adjacent to these zones contained numerous worked chlorite chips, but no evidence for pit or shaft mines was discovered in the area during a brief exploration in 1973. It is hypothesized that during period IVB1 when a consistent supply of chlorite was needed to meet production demands, chlorite was mined in the zones near the site and, having been reduced for transport, was brought to the large workshop on the mound. In other periods extensive mining activities were not necessary to satisfy the local requirements. Prospectors simply trekked into the mountains, obtained the chlorite they needed for their immediate purposes from the abundant surface outcrops, and returned home.
Efforts were made to reconstruct the stages of the production of the elaborately carved stone vessels that were manufactured exclusively during period IVBI. Examination of partially worked fragments, together with experimental attempts at smoothing rough chlorite and the microscopic analysis of wear patterns on IVBI flints, helped us distinguish five steps in the production of the vessels.

First, the raw material was brought directly to the site. No standardized stone blanks have been found during IVBI, and the negative evidence implies that the material was only broken down to portable size and then carried from the mines to the workshop. The rough chunks apparently were cut by flint tools to the approximate dimensions of the finished vessels and then painstakingly hollowed out by individually directed blows of sharp metal points that occur throughout the IVBI levels. The shallow vertical gouges, which appear on unfinished fragments, are struck to different depths and at different angles; they clearly show the limitations of the lapidaries' technology and underscore the fact that handcrafted, not mass-produced, vessels were fashioned at the Yahya workshop. After shaping the vessel, the exterior and interior surfaces were smoothed by wetting and randomly rubbing small serpentine flakes across the gouges. In this process the artisan directly modified and altered the half-formed stone objects. No lathe, even one turned by a simple bow-drill, was used to facilitate the process. Production short-cuts were neither desired nor devised for the 'profit' of these craft goods was not related to maximizing output by minimizing production time: the value of the vessels varied directly with the expenditure of labor employed in their manufacture. Finally, the smoothed vessels were laboriously carved, probably with metal tools, and certain designs were then colored and inlaid.

The production of the carved vessels at Type Yahya sharply contrasts with the modern mass-production of black-and-white lacquered soft stone vessels from Meshed in northeastern Iran. There, stone blanks are piled outside each small work area. The blanks are quickly hollowed by a heavy pounding implement set with several sharp parallel metal teeth and then mounted on a rudimentary lathe and smoothed. The stationary tool held against the revolving vessel leaves thin parallel scratches on the vessel's exterior and interior surfaces. Work is sharply divided among those who bring the raw material, form the blanks, hollow-out the
vessels, smooth them, and paint them. The division of labor for the handicraft industry at Yahya was less sharply demarcated. Even if we assume that the artisans did not procure the raw materials themselves and that some division separated those who formed, hollowed, and smoothed the vessels from those who carved the intricate designs, the production at Yahya was still incomparably slower than at Meshed. The striking difference between the third millennium and modern industries relates both to their distinctive means of production and contrasting transport facilities for the distribution of their products, on the one hand, and the nature of the demand, the market, for the vessels, on the other. The vessels from the Meshed workshop are purchased as decorative items by upper and middle classes, wealthy foreign tourists, and indigent pilgrims anxious to leave the Holy City with some memory of their visit; on the basis of their discovery in 'royal graves' and 'temples', the third millennium vessels appear to have been acquired only by the upper ruling strata of the early urban centers.

The products of the IVB1 workshop, the elaborately carved vessels, have aroused interest in Southwest Asian archaeology since Ernest MacKay in 1932 compared a design on a carved fragment from the lower levels at Mohenjo-daro with that on one-half of a conjoined vessel from Susa. Other parallels were soon documented and gradual—

The earliest example from period IVB2 is not a vessel but a peculiar perforated instrument apparently carved with a guilloche design typical of some later vessels. The bulk of Intercultural Style fragments from Yahya were found in the chlorite-laden workshop levels of period IVB1 while later stratified examples probably represent heirlooms or material brought up from earlier levels during construction.

Space does not permit us to detail the distribution of examples for such major motifs, but we will briefly illustrate some examples characteristic of three major designs of the Intercultural Style. The combatant snake motif shows a stylized serpent confronting another fearsome animal, normally a second monstrous snake, but sometimes a feline or eagle. Most vessels decorated with the combatant snake design were colored with various pastes and inlaid with semi-precious material. The most spectacular example of a colored and inlaid vase was found in level IVB of the Inanna Temple at Nippur; it was intriguingly inscribed "Inanna and the Serpent." The base of a similar snake-feline fragment from Yahya is set off from the design almost precisely the same fashion as another chlorite vessel from Nippur depicting a snake confronting an eagle. The holes drilled in the animals' bodies on both vessels suggest that they were inlaid, but additional
1. Combatant snake and eagle from Nippur.
2. Combatant snake-feline fragment from Tepe Yahya.
3. Reverse of date palm plaque from Tepe Yahya, showing humped bull.
4. Handle (7) with two snakes, mouths touching, and distinctive representation of scales.
6. Combatant snakes from Susa in the Louvre.
7. Reconstruction of date palm plaque from Tepe Yahya (1:1).
8. Humped bull from Tarut.
examples from Yahya and other sites show that the snakes' scales could be represented in various fashions. Page 26, no. 4 in particular, illustrates the variety inherent in the design: two snakes have their mouths open but touching and their bodies decorated by small punctate impressions.

Another famous representational design depicts both animal and human figures. We illustrate examples from Yahya, the Diyala Valley, and Tarut Island in the Persian Gulf that show a humped bull or zebu. Frankfort believed that the design on the vessel from Agrab reflected an Indian or eastern influence but categorically insisted that the vase was locally produced. The bull on the Tarut vessel is set with holes for inlay, while the fragments from Yahya and Agrab show scorpions, placed horizontally in the example from Yahya and vertically in that from the Diyala Valley, above the back of the bull. The grammar or meaning of the juxtaposition of these motives apparently was unaffected by the placement of the scorpion. The variation evident in all examples of the Intercultural Style relates primarily to the production process itself: that is, each vase, even those found together in the single workshop at Yahya, is unique because each is carved separately by hand. Design elements are standardized and, no doubt, have significance which we can only dimly perceive, but within this standardization there is tremendous variety, a tribute to the playful imagination of skilled craftsmen.

The same theme of variety within uniformity once more is apparent in examples decorated with the simple, closely set imbricate design. The fragments from Shahr-i Sokhta and the Dasht Valley have lines incised within semi-circular or rounded patterns; those from Khafajeh and the first two from Tarut (cf. also the imbricates above the humped bull from Tarut) are cut deeply within more angular designs. The lines on the eastern vessels are not symmetrical, nor do they form a perfect pattern of superimposed triangles; more lines slant upwards to the left than to the right. Such variation, in this case, may have geographical or chronological significance or may again, as I believe, reflect the diversity inherent in handicraft production.

The determination of the number of centers producing the elaborately carved vessels could not rely on detailed art historical or attribute analysis for two reasons: the total number of examples of any design motif was too small and distributed over too many sites to permit statistically significant results; and the variety evident in the examples from the single undisputed workshop at Yahya precluded such fine analysis. With the assistance of Dr. Sayre and Dr. Harbottle at Brookhaven National Laboratory, I employed numerous physical and chemical techniques for the purpose of distinguishing separate centers of production. Over three hundred and fifty geological and archaeological soft stone samples from
Southwest Asia, including 109 Intercontinental Style samples (roughly 37% of the known corpus) were obtained and analyzed by X-ray fluorescence. Sixty-three of the tested Intercontinental Style samples were not carved from chlorite but from steatite. Thirteen of these steatites were from the Sumerian city of Adab, while one each came from Mari, Kish, and Tarut. The distribution cannot be accidental and must indicate a corporate workshop either at or mainly serving Adab.

The remaining chlorite Intercontinental Style samples were being destroyed, measuring the relative intensity of the basal plane peak reflections for each sample and grouping them so as to get only one measure of heavy atom content. Four groups were formed which seemed to have generated a similar style.

1) A separate chlorite source was posited for samples from Sumerian city-states (n=21). The group includes one sample from Tepe Yahya, but it is not currently known if this uncarved material from Damin, Bampur, and the one carved fragment from Shahri-kohdas, included in this group, suggest that Sumer may have obtained its chlorite from sources east of Yahya.

2) Samples from Susa, Susa, and Mari formed a close group (n=20). Presumably, material in this group was produced in the workshop of the workshop’s master. The fact that two chlorite samples from Adab are included.

3) Samples from Susa and Mari were again associated in a close group (n=19). Large chlorite deposits are known to exist in the western Zagros south of Samandag, and samples from this group may have come from a separate source in this area. Alternatively, the master in this group may have purchased his materials from several sources.

4) Material from the Persian Gulf, Susa, and Adab forms a distinct group (n=19). Samples from this group have come from a source in the Arabian peninsular (western Oman?).

These analyses confirmed the existence of five major sources of chlorite-carved vessels in the Intercultural Style. Distinguishing between vessels carved in the Intercultural Style, detected a correspondence between material and region, and, with the help of Sumerian city-states, on the other, and discovered the unexpected unique role of India in the exchange of these vessels. Commodities carved to very specific standards were produced or originated in at least two different countries, in widely separate regions for consumption, and distributed in the urban centers of Sumer and Khuzestan.

When did the local production and long-distance trade of these vessels occur? The best stylistic arguments are consistent with most art historians today preferring an early date within the Early Dynastic Period (ca. 2900-2350 B.C.). For example, featured musicians on a famous vessel from Adab wear headdresses made of feather-like leaves. Compared to that on the famous "Personnage Aux Plumes" relief from Tello which has been dated on palaeobotanical grounds to the Early Dynastic Period (ca. 2900-2750 B.C.). Another vessel, however, carved with human figures was labeled as "Early Dynastic" (ca. 2350-2200 B.C.) at Ur and inscribed "Rimush, King of All, smiter of Elam and Barakhaa" in honor of the Akkad dynasty. This latter fragment from Ur is a heirloom kept and inscribed centuries after it was made. This may suggest that these vessels, so remarkably similar in subject matter and style, carved continuously for several hundred or more years?

The stratigraphic evidence from Yahya as well as a detailed examination of the context of stratified examples from Mesopotamia would suggest a slightly different answer. Although the material from Yahya, which is largely limited to the scurfy IVB workshop levels, provides little help in dating the style absolutely, it does suggest that most vessels were made in the last half-century of the second millennium B.C. We have seen that the principal center of the Intercultural Style was the carved vessel, and the master had made such trade all the more attractive.

This long-distance trade did not simply result from a surplus of goods of long-distance provenance, the fact that luxury articles, like the carved vessel ceramics, were produced in far-distant locations and thus highly prized and made such trade all the more attractive.

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