

## GODEDZOR, A LATE UBAID-RELATED SETTLEMENT IN THE SOUTHERN CAUCASUS

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### INTRODUCTION

The 2004 discovery by a French-Armenian mission of the site of Godedzor in southeastern Armenia (Vorotan Valley), which produced painted sherds, some of which are related to a late phase of the Ubaid period, as well as chaff-tempered ware in abundance, casts new light on the relations that existed at the end of the fifth millennium between Transcaucasia and the northern Near East.

The Chalcolithic period (fifth to the first half of the fourth millennium B.C.) remains among the least understood phases of development in the prehistory of Transcaucasia. The recent proposal by Kiguradze and Sagona (2003) to fix the beginnings of the Chalcolithic at about 4800 B.C. appears reasonable in relation to Near Eastern chronology. The Sioni cultural complex, which should represent the Early Chalcolithic period (approx. 4800–4000 B.C.) in the Kura Basin (Kiguradze 2000; Kiguradze and Sagona 2003) and the Middle Araxes Valley (Badalyan et al. 2004; Narimanov 1987), is featured by flimsy structures and a grit-tempered pottery production (obsidian is very common in the paste), decorated with incised rims, knobs, and combing of the external surfaces. At the same period in the steppes of Azerbaijan, the use of plant temper in pottery is widespread, and the presence of red-slipped ware (Ilanly Tepe, Kyulli Tepe, etc.), Dalma impressed ware (Ilanly Tepe, Ezgennitepe, etc.), and Dalma painted ware (lower level of Alikemek Tepesi) are evidence of contacts with northwest Iran (Narimanov 1987).

### GEOGRAPHICAL LOCATION

The Vorotan River takes its source at about 3,000 m above sea level on the high volcanic plateaus of Syunik, in the southeast of the Lesser Caucasus. It crosses vast outcrops of obsidian (the Satanakar and Sevkar volcanos) before flowing into a wide glacial valley oriented northeast–southwest. The site of Godedzor is situated here, at an altitude of about 1,800 m above sea level, northwest of the village of Angeghakot, on the upper terrace of a canyon, cut in the basaltic lava flows. The area occupied by the site has served for several years as a basalt quarry, and a large part of the archaeological remains has been destroyed. A rescue excavation was thus carried out in one of the most threatened sectors; but the extension of the area, on which Chalcolithic sherds were discovered (approx. 12 ha), gives hope that other zones of occupation may have been preserved.

At the outlet of the canyon a ford enables an important road from the steppes of Azerbaijan (region of Agdam) to cross the Vorotan (fig. 23.1) and to follow the valley of one of its tributaries in the direction of the Bichenak pass, which is locally the only route toward the Arax Valley to the south (Nakhichevan region). The inhabitants of Godedzor thus settled near a major axis of communication, which crosses the mountains of Zangezour from east to west and links the Kura Basin to that of the Arax. In Nakhichevan, this line of communication joins the main route from eastern Turkey (Erzurum), which follows the valley of the Arax and leads to northwest Iran (Tabriz), crossing the Arax at Djulfa and edging toward the Lake Urmia Basin.

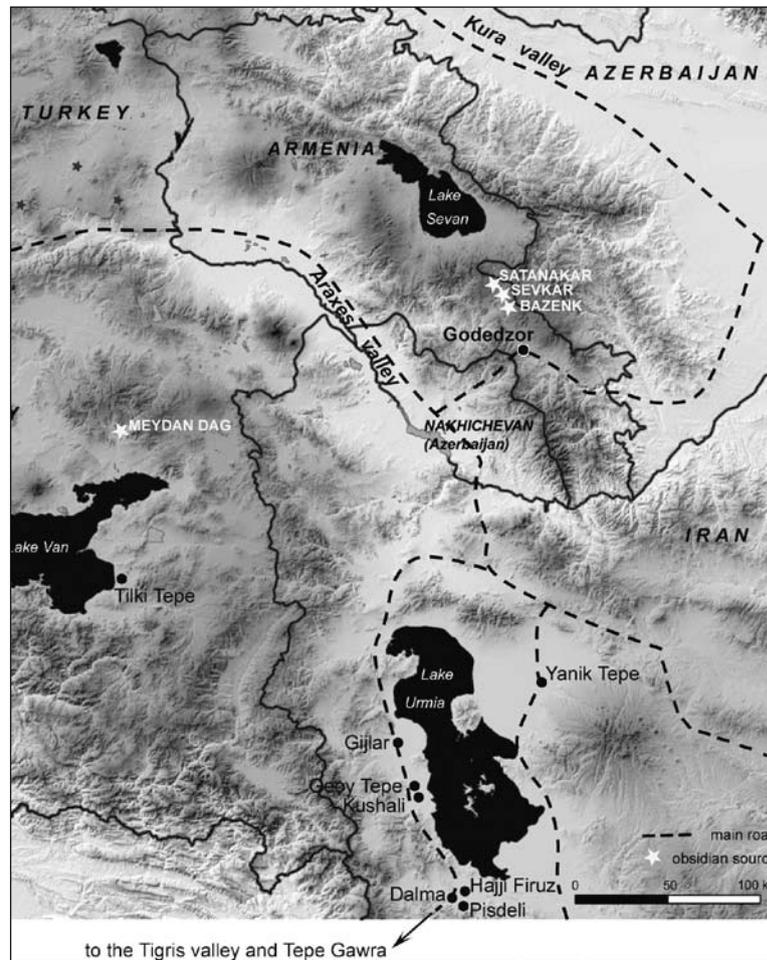


Figure 23.1. Main routes of communication between the region of Godedzor and the northern Near East

## FIELDWORK AND STRATIGRAPHY

In 2004, an initial rescue excavation was carried out on the upper terrace of Godedzor, which had been partly destroyed by bulldozers. The remains of a circular building with stone walls were brought to light, with an occupation floor covered with obsidian artifacts, objects used for grinding, and crude pottery with a high content of plant temper. In an excavation below the terrace, among the many sherds that probably came from a habitation destroyed by the bulldozers, charcoal was found that was dated to  $4,610 \pm 35$  B.P., that is, 3500–3347 cal. B.C. (Ly-2760),<sup>1</sup> which constitutes a *terminus ante quem* for the site.

In 2005 and 2006, excavations were undertaken on a platform adjacent to the preceding excavation. Two trenches of 45 sq. m each (A and B) were opened, which revealed two phases of occupation:

1. between 0 and 50/55 cm, a construction level of the mid-first millennium B.C. with large rectangular buildings having double-faced walls and a paved floor, on which was found pottery of the Iron Age and the Achaemenid period;
2. between 50/55 and 95 to 150 cm in depth according to the sector (virgin soil was not reached), the foundations of the preceding walls had disturbed a level that produced a few circular walls constructed of a single range of stones and a large amount of Chalcolithic material, including chaff-tempered ware, many clay and bone spindle whorls, several clay hearth stands, and bone artifacts with incised decoration.

<sup>1</sup> The dating of the deepest horizons, reached in 2005 and 2006, is in progress.

These remains are evidence of the presence at Godedzor of a material culture that is completely different from the Transcaucasian complex of Sioni and is related to the Near Eastern tradition. We thus attempt to define the following:

- 1) the elements of this Ubaid-related presence,
- 2) the exchange networks in which the Godedzor community was involved, and
- 3) the practical means of interaction.

## MATERIAL CULTURE AND UBAID-RELATED ELEMENTS AT GODEDZOR

The material culture of Godedzor is obviously of Near Eastern affinity, but the exact links with the Ubaid are seen only in the pottery, and only in a limited way. No element of the Ubaid material-culture assemblage is present at Godedzor, for example, tripartite houses, bent clay nails, cone-headed clay figurines, clay sickles, sling balls, or clay tokens (Jasim 1985; Stein 1994: 37). The inhabitants of Godedzor seem rather to belong to one of the “Ubaid-related” communities that developed during the fifth millennium at the periphery of the Syro-Mesopotamian world.

### PLAIN WARE

All the Chalcolithic pottery from Godedzor is handmade, and the pots are generally hand built (especially in the case of the medium and large vessels) by means of superimposing slabs of clay; these often break at the junction point. In some cases, especially when slips were applied, the presence of fine parallel lines on the surfaces suggests that some slow-rotation device was also used in the fabrication process. Most of the pots have been hastily and roughly made without any particular care taken in the surface treatment, the finishing, or other aesthetic or formal details of fabrication.

### *Technological Features*

#### Chaff-tempered Ware

This is the most common group in the Godedzor pottery. The pots are characterized by the constant and abundant presence of chaff (more than 90%) in the clay, and seed impressions are also sometimes visible. Plant inclusions range from small or medium to very coarse, and generally their dimensions vary in accordance with the dimensions of the vessel and the width of the cross sections (fig. 23.2a). Rarely, mineral inclusions (tiny fragments of obsidian, fine and medium black sand, mica inclusions, and medium/coarse pebbles) are seen in the clay.

External surfaces are often characterized by reddish, gray, or blackish patches that could have been the result of open firing and of uncontrolled firing atmospheres. There are also cases of sherds with single (external or internal) very dark or black surfaces, which could suggest alternating firing atmospheres, but it is still not clear whether this bicolored effect was obtained deliberately. Internal and external surfaces colors range from pink (2.5YR 6/4, 7/6, 7/8; 5YR 6/4, 6/6, 6/8, 7/4, 7/6, 7/8; 5YR 7/6; 10R 6/6, 6/8), to reddish brown (10R 5/8; 2.5YR 5/6, 5/8), to brown (2.5YR 5/4; 5YR 5/3; 7.5YR 7/6), to orange (2.5YR 6/6, 6/8), and to buff (10YR 7/2, 7/4). Cross sections often show a non-oxidized gray to blackish core, which confirms that firing (perhaps because too brief or carried out at low temperatures) did not manage to attain fully oxidizing atmospheres. Surface treatment and finishing are unusual and generally consist of wet-smoothing and slip-burnishing. Slips are often very difficult to detect, as the tiny film of clay is often the same color as the clay used to make the vessel. Burnishing is present only when the surface is slipped.

Such poorly fired, straw-tempered pottery, the use of the slow wheel, and the rarity of decorated vessels are features common not only to the whole of the Syro-Mesopotamian world in the Late Ubaid period, but also to its periphery, in the northern and central Zagros (Akkermans and Schwartz 2003; Rova 1999–2000; Henrickson 1983). This trend has been related to the new needs of large-scale and low-cost pottery production and the massive use of chaff for tempering purposes allowing a shorter firing time and the saving of fuel.

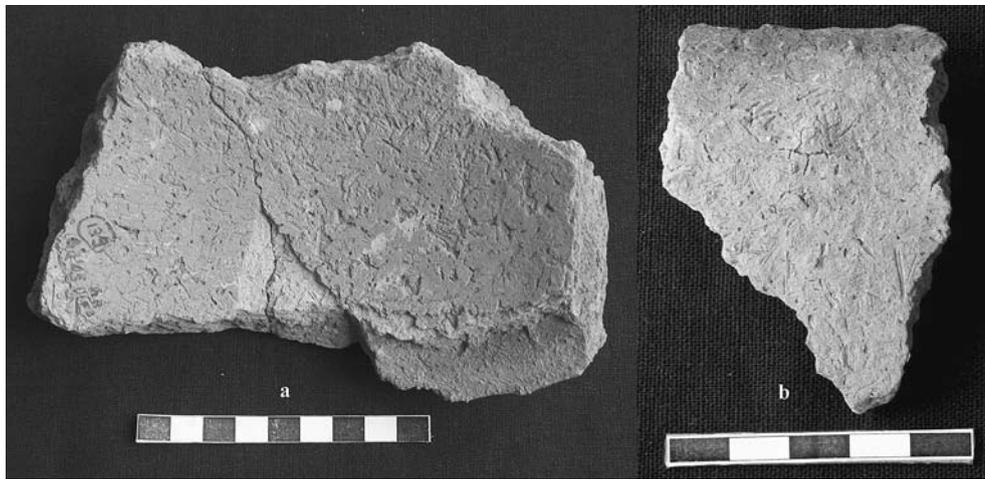


Figure 23.2. Ceramic technology at Godedzor: (a) coarse chaff-tempered ware, (b) chaff-and-grit tempered ware

#### Cream/White-slipped Ware

Cream/white-slipped ware, practically identical to the coarse chaff-tempered ware, is characterized by the frequent presence of a thick, whitish cream or pinkish slip (10YR 8/3, 8/4) on the external surfaces of the vessels (medium and large jars only). These are essentially containers that could have been intended for the transport or conservation of food and produce, and it is possible that this special surface treatment was intended to render the containers more protective and hygienic for the storage of food.

#### Chaff-and-grit-tempered Ware

Chaff-and-grit-tempered ware is characterized by the presence of both medium and very fine plant inclusions (but coarse plant temper is sometimes also present) and mineral temper (40/50%), which consists of small pebbles, gray or black sand probably (taking into account their percentages) intentionally added to the clay (fig. 23.2b). The remaining technological features are very similar to those already described for the chaff-tempered ware.

#### Grit-tempered Ware

Grit-tempered ware is characterized by the almost exclusive presence of fine and medium mineral temper (coarse inclusions are rare) consisting of small (whitish, black, or gray) sand particles and mica inclusions. Color surfaces vary from pink (5YR 6/6, 7/4, 7/6) to light brown (7.5YR 6/4), to brown (5YR 5/3, 5/4, 6/6), to reddish brown (10R 5/4), to dark gray (7.5YR 5/1, 5/2, 5/3). Usually vessels from this group have thinner sections than those of the other groups.

#### Decoration

A few sherds, which belong to the chaff-tempered or the chaff-and-grit-tempered groups, are decorated with applique or impressed motifs. Sherds with applique present small (2 cm maximum) circular and oval lumps/pellets of clay stuck (apparently without following any precise pattern) on the external surface of the vessel (fig. 23.3a). The finger-impressed pottery is characterized by medium-sized finger impressions on the external surface of the pot.

Some cream/white-slipped ware jars present a dense number of small circular impressions on the external surface of the base (fig. 23.3b). But rather than a decoration, this feature could have been functional, for example, to protect against slippery floors and surfaces. Such a technique is attested in the central Zagros during the Seh Gabi phase (second part of the fifth millennium B.C.; Henrickson 1983: fig. 53:1). These applique and impressed decorations have strong analogies with the productions of Dalma Tepe, on the southwestern shore of Lake Urmia, where the “Dalma surface-manipulated” pottery seems to be typical in contexts of the mid-fifth millennium B.C. (Hamlin 1975; Voigt and Dyson 1992). This pottery style, or the diffusion of the idea for such decoration (perhaps simpler to learn than would be a painted style), went through southern Azerbaijan and eastern Kurdistan into the northeastern valleys of Luristan, then down the Khorasan Road into the Hamrin (Abada I–II) and north along the Zagros pied-

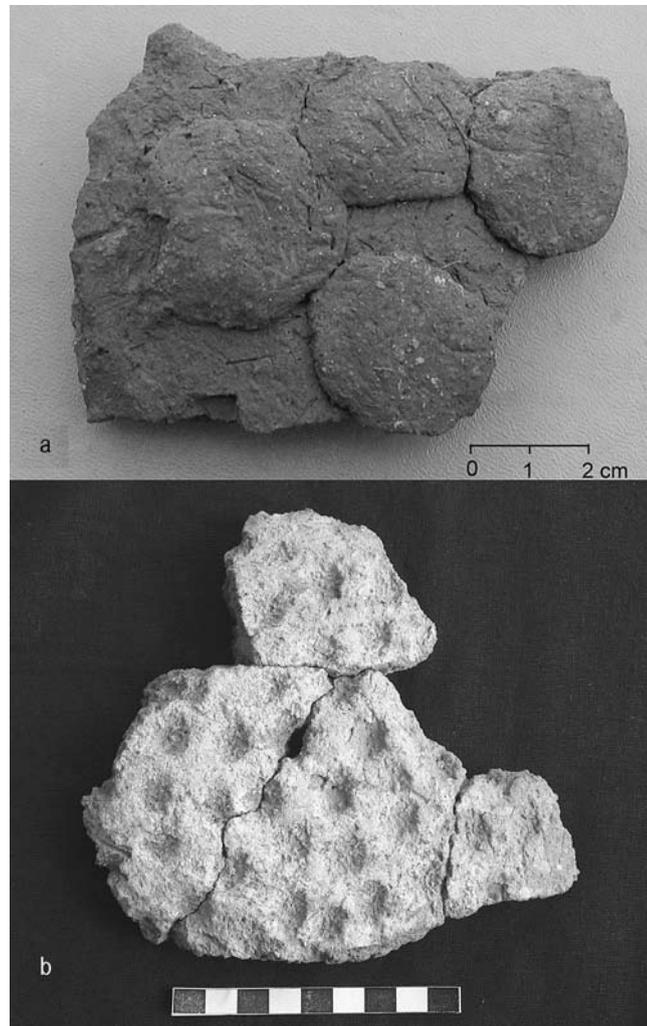


Figure 23.3. Ceramic decoration at Godedzor: (a) applique motifs (chaff-tempered or chaff-and-grit-tempered groups), (b) impressed motifs (cream/white slipped group)

mont into the Kirkuk area (Nuzi) in small amounts (Henrickson 1983, 1989). But this pottery also diffused, along with the Dalma painted ware, toward northern Azerbaijan, as it is present on several sites of the steppes extending from the Lesser Caucasus to the Caspian Sea (Narimanov 1987).

### *Morphological Repertoire*

In the morphological repertoire of the Godedzor pottery, there is a strong prevalence of closed shapes (jars) over open ones (bowls), both with simple rims. The typologies are well defined, and the same profiles are often repeated in a wide range of sizes. Chaff-tempered and chaff-and-grit-tempered jars with a short, flaring neck, simple rim, and ovoid body represent one of the most common types of the local repertoire; very high variability is observable at the angle of juncture between neck and shoulder (fig. 23.4a–f). From the presence of very thick fragments of chaff-tempered ware, it is possible to hypothesize the presence of large pithoi. Open shapes are represented by hemispherical bowls with simple rims and by flat bowls with convex walls and simple rims (fig. 23.4g–h). Both types are fabricated in either chaff-tempered or in chaff-and-grit-tempered ware.

It is important to stress the relatively common presence of lugs and handles on the medium and large jars (fig. 23.5a–b). Moreover, a jar with three handles on the shoulder has no parallels in the Chalcolithic repertoires either in the southern Caucasus or in the neighboring regions (northern Iran and northern Mesopotamia; fig. 23.5c). Lugs and handles foreshadow traits that will be typical of the pottery assemblages of the earliest Kura-Araks culture (Kiguradze and Sagona 2003).

It is still too early to hypothesize on the existence of connections and continuities between the Godedzor ceramics and the later Kura-Araks ones. Handles on the Godedzor ceramics indicate the basic need for transportability,

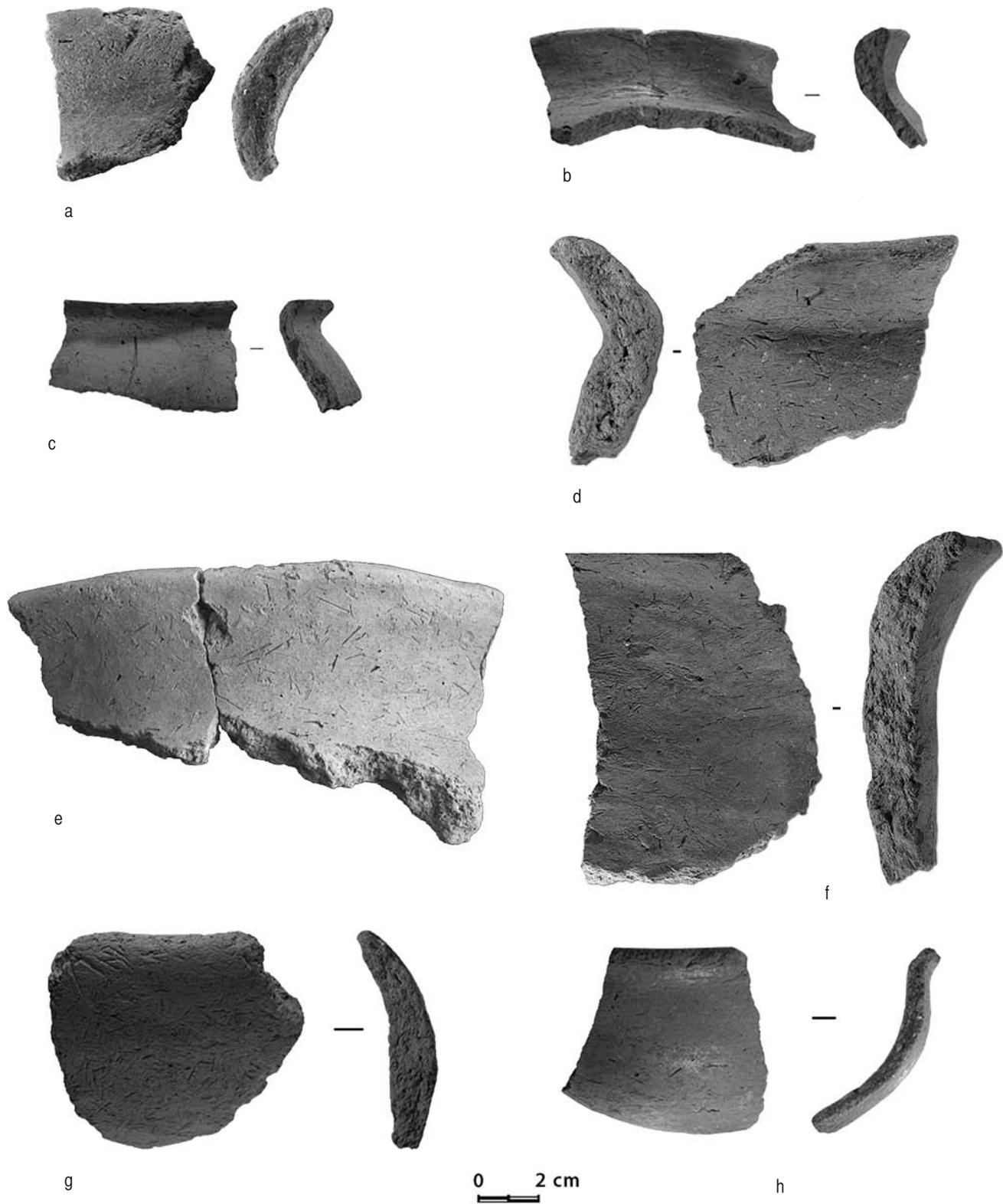


Figure 23.4. Morphological repertoire of Godedzor ceramics: (a–e) jars with low everted necks, (f) jar with high vertical neck, (g) hemispherical bowl with slightly inverted rim, (h) hemispherical bowl with everted rim

understandable in a social and economic milieu that was probably characterized by transhumance and territorial mobility. These same practices and ways of life will also be common among the later Kura-Araks communities.

### PAINTED WARE

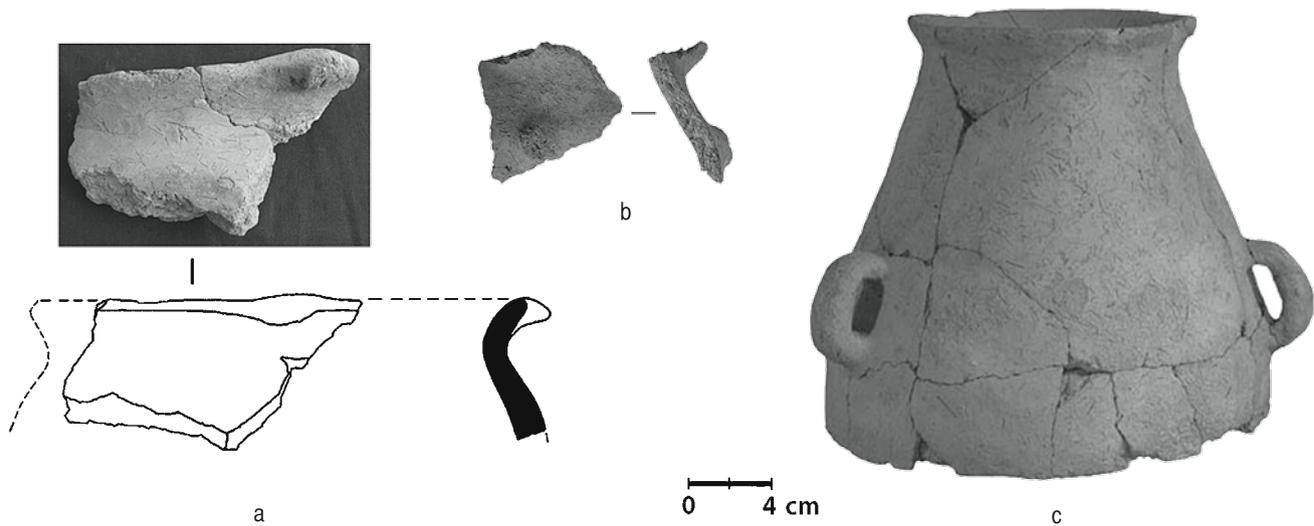


Figure 23.5. Lugs and handles: (a) pot with a low everted neck and a lug on the rim, (b) jar with bases of a loop handle on the shoulder, (c) three-handled jar

Among the painted sherds found so far in the Chalcolithic level of Godedzor, only a minority are related to the Ubaid tradition (“Ubaid-like painted pottery”), most being of regional fabrication, from the basin of Lake Urmia.

### *Ubaid-like Painted Pottery*

Only a handful of sherds belong to this group. They are characterized by a very fine clay with extremely small grit or mica inclusions. The sections of the body sherds are usually very thin, and firing must have reached very high temperatures. External surfaces are white or cream slipped (2.5Y 8/3, 8/4, 8/6; 10YR 8/3), while the internal surfaces are plain and pink, light buff, or greenish. The paint is dark brown or black, and the motifs on the sherds recovered so far consist of small, superimposed black triangles (fig. 23.6).

All the fragments retrieved so far belong to small-sized jars. These triangular motifs find close analogies with those found in some Mesopotamian settlements of the Ubaid 3 period (e.g., Eridu IX; Safar, Mustafa, and Lloyd 1981), but appear also to be typical of the Late Ubaid decorative style of the second half of the fifth millennium. The

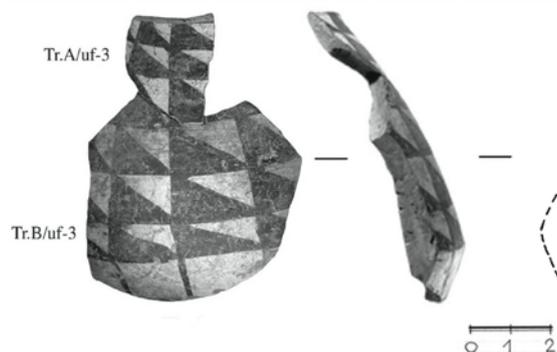


Figure 23.6. Ubaid-like painted ware

closest parallels have been found at Tell Abada II–I (Jasim 1985: fig. 151:14), Tepe Gawra XII (Tobler 1950: pl. 139), and Tell Leilan VIb (Schwartz 1988: pl. 16e).

### *Northwest Iranian Painted Pottery*

The northwest Iranian painted-pottery group is characterized by a whitish/yellowish slip (10YR 8/2, 8/3) on the external surfaces. Internal surfaces and cross sections tend to be pink or light yellow, and the core is always fully oxidized. This is fine, well-fired pottery, the clay being compact with mixed inclusions consisting of medium and fine chaff and fine grit and sometimes exclusively very fine grit. The paint is matte black or very dark brown, and the decorative motifs (fairly standardized) consist of bands of simple zigzag or wavy lines running horizontally along the neck and the body of the container, creating horizontal spaces filled with triangular, trapezoidal, and rectangular densely cross-hatched panels (fig. 23.7).

This painted pottery seems to be represented by only small and medium jars. The painted motifs and the technological features of this pottery group have close parallels with similar productions from the Chalcolithic sites of Lake Urmia (R. Biscione, pers. comm.) such as Pisdeli Tepe or the lowest strata of Tappeh Gijlar C (Dyson and Young 1960; Belgiorno, Biscione, and Pecorella 1984), before links developed between this region and southeast Turkey as demonstrated in the upper strata of Gijlar C and level M of Geoy Tepe (Voigt and Dyson 1992; Trufelli 1997; Helwing 2004).

The pottery of Pisdeli, of local fabrication, is clearly influenced by the latest Ubaid styles of northern Mesopotamia (Gawra XII–XIIA) and is part of the handmade, monochrome-painted, buff ware ceramic “co-tradition,” which includes the central Zagros highlands and the Khuzistan (Susa A) phase (Henrickson 1985b). However, the Zagros highland region (including the Urmia Basin) was clearly not a monolithic “Ubaid-related” culture area throughout most of the fifth and the beginning of the fourth millennium B.C., but rather an environmentally and culturally diverse mosaic with its own strong local ceramic and presumably cultural traditions (Henrickson 1983: 397).

The ceramic stylistic similarity between the northern lowlands (Gawra) and highlands (Pisdeli) at the end of the Ubaid period may reflect Gawra’s apparently active involvement in a long-distance mineral trade network; the northern route to the area of mineral resources in eastern Iran and Afghanistan crosses the northern Zagros south of Lake Urmia, near Pisdeli Tepe.

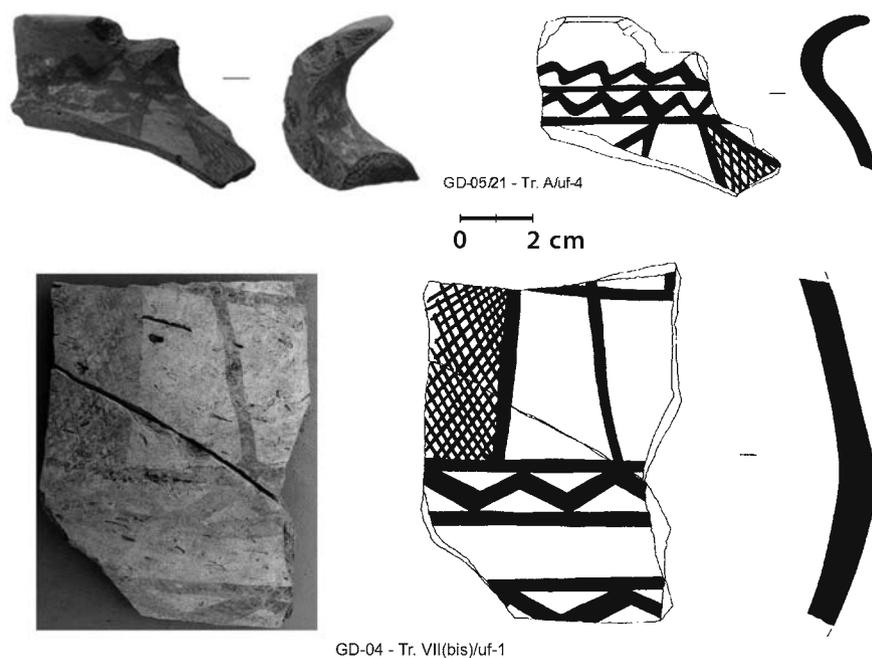


Figure 23.7. Northwest Iranian painted ware

## EXCHANGE NETWORKS

Most of the materials sought by the inhabitants of Tepe Gawra (lapis lazuli, chlorite, serpentine, hematite) are absent from the southern Caucasus. However, obsidian and copper are well attested in the southeast of the Lesser Caucasus, where the settlement of Godedzor is located.

## COPPER

An abundance of copper ore is located not far from Godedzor in the southeast of the Lesser Caucasus, on either side of the Arax, in Armenia (Kafan, Agarak), in Nakhichevan (Vayhir, Ourabad), and in Iran (Ahar, Astamal, Zandabad). Other large deposits are located more to the north in Karabakh and in the Kura Valley (Kedabek). But it is very difficult to know when the exploitation of these different deposits began. The only prehistoric evidence of mining known in the whole of this region comes from Vayhir, in Nakhichevan, and dates to the third–second millennia B.C. (Schachner 2002).

In the lowlands that surround the southern end of the Lesser Caucasus, a few sites of the fifth millennium (Gargartepesi and Chalagantepe in the steppes of Karabakh; Kültepe I in Nakhichevan) have produced copper objects, but none has produced slag or tools for casting. These appear in the first half of the fourth millennium, in particular at Leilatepe in the steppe of Karabakh, a settlement that in its architecture and objects clearly differs from the neighboring sites and reveals a comprehensive array of northern Syria Late Chalcolithic 3 materials (“pre-Contact phase”; Aliev and Narimanov 2001; Lombard and Chataigner 2004).

At Godedzor, copper objects are rare but present (awls), and no tool or slag provides evidence of local copper-working. It is the same in the basin of Lake Urmia, where the Chalcolithic sites of the fifth millennium (Dalmatepe, Tepe Seavan, Pisdeli Tepe, etc.) produced no copper objects and where those of the fourth millennium (Tepe Gijlar, Geoy Tepe, Yanik Tepe, etc.) have only produced rare examples (Kroll 2002).

In the last phase of the Ubaid period, to which the settlement of Godedzor belongs, it appears that the exploitation of copper ores in the southeastern Lesser Caucasus had not yet taken place and could not have been one of the reasons for the establishment of the site.

## OBSIDIAN

Almost all the lithic industry of Godedzor is in obsidian (98%), though there are some rare flint and quartzite pieces.

*Local Exploitation*

Most of the obsidian artifacts were worked from pebbles washed down by the Vorotan River and its tributaries from deposits near its source; many of these objects still have the “cortex” of pebbles rolled by the river, with a matte, rounded surface marked by repeated shocks (fig. 23.8f). The small nuclei from these pebbles permitted the attainment of flakes (fig. 23.8g), small blades (fig. 23.8b) then retouched as “knives” (fig. 23.8c), points, notched pieces (fig. 23.8e), end scrapers, and burins (fig. 23.8d). The lithic industry of Godedzor is characterized by the absence of a specific technique of debitage, a large percentage of artifacts having no particular evidence of having been worked, as well as a predominance of occasional flakes with retouch.

However, another group of objects (larger blades) was knapped from blocks of obsidian taken directly from the outcrops. This was also the case for three large conical nuclei (fig. 23.8a) found near a basalt rock with engraved representations. The presence of these nuclei, found together on the site, is surprising, all the more so since so far no tool has been identified as corresponding to removals from them. It is possible that they were intended for export.

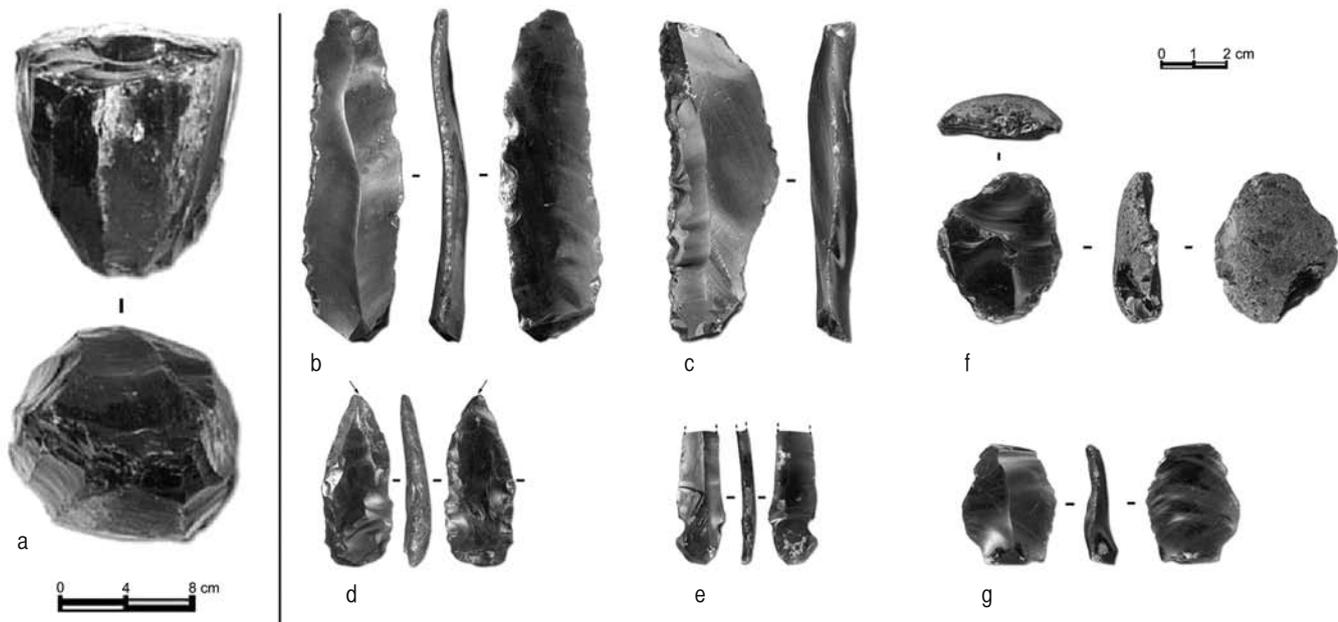


Figure 23.8. Chipped stone (obsidian): (a) large conical nucleus, (b–c) small blades, (d) burin, (e) notched piece, (f) pebble with cortex, (g) flake

### *Diffusion of Sevkar Obsidian*

The chemical analyses carried out on the samples from the different sources of obsidian from Syunik (Satankar, Sevkar, Bazenk) have shown that these flows have similar compositions, characterized in particular by low contents of barium, zirconium, and yttrium (Keller et al. 1996). This signature, which is clearly distinguished from those of other sources in Transcaucasia, was identified in artifacts from southeastern Armenia and the steppes of Azerbaijan (Badalyan, Chataigner, and Kohl 2004) and also in a small group of artifacts from the Near East, group “3c,” identified by the laboratory at Oxford during pioneering analyses carried out in the 1960s (Renfrew, Dixon, and Cann 1966). The artifacts in this group all come from the basin of Lake Urmia, in northwestern Iran, and belong to contexts of the sixth millennium (Hajji Firuz) or the fifth–fourth millennia (Kushali Tepe, Pisdeli phase; Yanik Tepe, Late Chalcolithic).

The location of source 3c was then unknown, and Voigt (1983: 222) emphasized “the gross size (and therefore the weight) of the individual pieces of obsidian recovered from Yanic Neolithic contexts,” of which the clear/striated material is very similar to that of Hajji Firuz, which suggests that this source probably lies east of Lake Urmia (Mount Sahand or Mount Savalan). However, a survey carried out in 1999 in northwestern Iran, in the mountains of Savalan and Sahend and in the region situated southeast of Mianeh (Agh Kend), enabled us to take samples of a rock that is geologically obsidian because it consists of a vitreous matrix of more than 70 percent, but includes a high proportion of crystallized minerals (25 to 30%), which makes it unsuitable for knapping.

Otherwise, the work carried out in the 1990s by M. J. Blackman (NIST laboratory, USA) and J. Keller (Freiburg, Germany), to characterize geochemically the obsidian sources of Transcaucasia, have shown that the deposits of Syunik (and especially Sevkar) are the most probable sources for the obsidian of group 3c (Keller and Seifried 1990: 84; Badalyan, Kikodze, and Kohl 1994: 91; Blackman et al. 1998).

The obsidian of Sevkar thus had a very limited diffusion toward the northern Near East, because it is not known outside the basin of Lake Urmia. Moreover, in this region, the quantity of 3c obsidian appears to decrease rapidly over time. According to the rare chemical analyses carried out (table 23.1), from the Hajji Firuz phase onward, the obsidian of the region of Lake Van is also present: groups 3a/3b (Meydan Dağ/Tendurek) and 4c (Nemrut Dağ). This obsidian from the Van region is present in the Dalma phase (first half of the fifth millennium) and remains clearly predominant in the Pisdeli and Late Chalcolithic phases.

Table 23.1. Occurrence of obsidian groups

<i>Site</i>	<i>Cultural Phase</i>	<i>Group 3a/3b</i>	<i>Group 3c</i>	<i>Group 4c</i>	<i>Renfrew and Dixon 1976: 140–41</i>	<i>Voigt 1983</i>
Hajji Firuz	Hajji Firuz		3	×	nos. 181–83	p. 222
Yanik Tepe	Hajji Firuz		×		—	p. 222
Tamar Tepe	Hajji Firuz	1			no. 391	
Shatanabad	Dalma	2			nos. 395–96	
Dalma Tepe	Dalma	1		1	nos. 397–98	
Tabia Tepe	Dalma	2			nos. 393–94	
Kushali Tepe	Pisdeli	1	1		nos. 387–88	
Pisdeli Tepe	Pisdeli	3		2	nos. 204, 326–27	
Yanik Tepe	Late Chalcolithic	2	2		nos. 45, 86, 195–96	

A GIS study<sup>2</sup> of the circulation of obsidian in Transcaucasia (Barge and Chataigner 2003), to better understand the impact of relief and of distance on access to the sources of obsidian from the villages, has enabled the creation of a model for the most likely routes between the banks of Lake Urmia and the sources of the Sevkar, and to evaluate the time necessary to complete them: these routes go up the valley of the Nakhichevan River, following exactly the road that passes near Godedzor; they enable access to the obsidian deposits in 60 to 70 hours by foot, which is about 8 to 10 days. From Godedzor, only one day is necessary to reach the deposits.

The diffusion of the Sevkar obsidian beyond Transcaucasia is thus limited to the basin of Lake Urmia. This clearly indicates that this material was not integrated into the trade networks that crisscrossed northern Mesopotamia and enabled the Lake Van obsidian to be widely diffused (Cauvin and Chataigner 1998). However, the consistent diffusion of obsidian 3c between the sixth and fourth millennia suggests that the populations established in the basin of Lake Urmia had special links with those of the Vorotan Valley, that is, that the latter either “delivered” this material, or that they themselves ensured all or part of the journey. The relief of the high plateaus where the deposits are located is very mild and presents no difficulties for herds of oxen or sheep, which are still today moved seasonally in summer to these high pastures

## PRACTICAL MEANS OF INTERACTION: SPECIALIZATION AND MOBILITY

The site of Godedzor does not appear to be a sedentary or continuously occupied settlement, and the mobile way of life of its population would have been the consequence of a subsistence strategy based on herding. This evidence for the development of pastoralism in northwestern Iran around the end of the fifth millennium is part of a wider phenomenon that concerns a large part of the Zagros. The hypothesis of specialization and mobility of the population of Godedzor is supported by several arguments.

## LOCATION, ALTITUDE, SCARCITY OF THE ARCHITECTURAL EVIDENCE

Godedzor is situated at 1,800 m above sea level, on the upper terrace of the Vorotan, in a steppe environment favorable for extensive herding. This region is covered by a thick layer of snow from November to March (fig. 23.1). The village was probably not occupied during this period. The ethnographic sources (Mkrtyumyan 1974) indicate the

<sup>2</sup> Functions “cost-weighted distance analysis” and “least-cost path analysis,” ArcGIS (ESRI).

great difficulty that the populations of this region still had at the beginning of the twentieth century to ensure the survival of their herds during the long winters. It is also possible that a part of the population of Godedzor stayed on the site through the winter, while most of the herd descended to their winter pastures in the lowlands.

There are very few architectural remains: the only traces of habitation, which belong to the upper horizon of the Chalcolithic layer, consist of vestiges of circular walls with only one course of stones.

#### COMPOSITION OF THE HERD

The faunal remains from Godedzor evaluated up to now are dominated by the bones of domestic ruminants, reaching 65 percent of about 3,100 identified specimens. The remains of the small domestic ruminants attain about two-thirds of the identified sample and, although less than one-fifth of their bones were well enough preserved for species identification, it is worth mentioning that almost all of them are from sheep. Only five bones were attributed to the domestic goat, and the domestic pig is only identified with three bone fragments. This is important with regard to mobility of the herds. In flat terrain goats are quite slow, and mobile pastoralists usually concentrate on raising sheep, keeping only some goats as flock leaders (Henrickson 1985a: 16). Pigs are generally difficult to be directed and kept together.

Cattle were most important as meat producers, providing almost 40 percent of the total weight of the identified specimens. However, meat production may not have been the only purpose of their presence. In cattle, out of sixteen first phalanges, three show indications that the animals were used for labor. Among the second phalanges, this is a ratio of one in fourteen. In addition, a pathologic cattle vertebra was found (Tomé 2005), which might also be caused by using the animal for traction or for loading. As more than half of the cattle bones are from at least sub-adult animals, milk and labor may in fact have been the main purpose of cattle husbandry for the ancient inhabitants of Godedzor.

Without doubt, cattle and sheep would have been most useful within a herding system based on transhumance, and cattle would have been used for transportation of heavy loads, as the deformed vertebra suggests.

#### LIMITED ROLE OF AGRICULTURE

Appreciable quantities of naked six-rowed barley (*Hordeum vulgare*) and naked wheat (*Triticum aestivum*) were found at Godedzor, but legumes (*Lens culinaris*, *Pisum sativum*) are surprisingly rare. The scarcity of heavy-duty tools (grinding slabs and pestles) is also noticeable. This can be explained by the limited role of agriculture at Godedzor. The cereals could have been acquired partly from farmers who were settled along the migration route, in exchange for the shepherds' products (milk, cheese, meat, wool, textiles, skins). Small-scale cultivation in the summer pasture lands is attested among the nomadic pastoralists of the Central Zagros (Henrickson 1985a).

#### OBSIDIAN EXCHANGE

Three large obsidian nuclei were found grouped together on the site ready for later use, probably in the Lake Urmia Basin (wintering region), as the analyses of provenance indicate the exportation of obsidian from Sevkar toward this region. Note that this material does not seem to have been a product expressly sought by the inhabitants of Godedzor for using in trade, because it did not diffuse beyond the basin of Lake Urmia. Obsidian appears to have been a byproduct of the pastoral lifestyle. The high plateau where Godedzor is situated lies near large obsidian deposits, but only a limited quantity (limited in particular by the weight of the material and the fact that the pack or draft animals would have been already heavily loaded with tents and belongings) could have been brought down for personal use or for local trade.

#### OTHER FACTORS CHARACTERISTIC OF NOMADIC CAMPSITES

To these elements, which suggest the mobility of the population that lived at Godedzor, may be added the features that, according to Abdi (2003: 406–07), are characteristic of nomadic campsites:

- the establishment of the village along a migration route, as the village looks over the Vorotan River near where it is forded by the only route crossing this part of the Lesser Caucasus, which leads to the south and the Arax Valley;
- a repetitive seasonal occupation, suggested by the thickness of the Chalcolithic level, which despite the absence of architectural remains is nearly 1 m in depth (without reaching virgin soil) and by the enormous quantity of material, mainly pottery, which it contains;
- a self-sufficient household, indicated by diversification in the methods of acquiring food (herding, agriculture, and hunting) as well as by domestic production.

Hunting played an important role. *Cervus elaphus*, *Bos primigenius*, and *Bison bison* contributed about 25 percent of the animal bone weight. Wild boar (*Sus scrofa*), wild sheep (*Ovis orientalis*), wild goat (*Capra aegagrus*), and the onager (*Equus hemionus*) were other hunted ungulates. The presence of large wild carnivores — bear (*Ursus arctos*), lion (*Panthera leo*), and leopard (*Panthera pardus*) — might be connected, in that these predator species were hunted and killed for the protection of the domestic animals. The diversity of the environment (forest, steppe, mountain) frequented by these wild animals could correspond to the number of different ecological niches crossed (and exploited) during the seasonal movements of the group.

Domestic production was related to the exploitation of secondary products of the herd:

- wool: the main working tools are spindle whorls and other bone tools (awls, pins, combs), which suggests that wool processing and textile production were among the main activities carried out in situ;
- milk and derived products: possibly the three-handled pot was used for making butter or yogurt.

## COMPARISON WITH TRANSCAUCASIAN CULTURES

In Transcaucasia, the society represented at Godedzor differs in every way from those that developed in the basins of the Arax and the Kura (cultures of Aratashen and Shulaveri-Shomutepe) in the sixth to the beginning of the fifth millennium B.C. These were characterized, in particular, by architecture in pisé or mudbrick and agriculture that was highly developed in quantity and variety (*Triticum monococcum*, *Tr. dicoccum*, *Tr. aestivum/durum*, *Tr. sphaerococcum*, *Tr. spelta*, *Avena sativa*, *Panicum miliaceum*; Lisitsyna and Prischepenko 1977; Chataigner 1995).

The Sioni complex, which succeeded the Aratashen and Shulaveri-Shomutepe cultures in the first half of the fifth millennium, is also indicative of a development toward a pastoral way of life: near-absence of constructed architecture, post holes indicative of light constructions, circular ditches considered to be enclosures for livestock (Varazashvili 1992). The pottery, however, is very different from that of Godedzor, as much in the technique (mineral temper is preponderant) as in the shapes or decoration (notches on the rim, rows of perforations or protuberances). This is why the pottery assemblage at Godedzor, which consists of coarse chaff-tempered ware and fine pottery with painted decoration, appears to be exogenous. It is probable that the painted pottery would have been brought from home, while the coarse pottery was made in situ; but both wares belong to the same cultural facies. The fact that the whole pottery assemblage moved would be another proof of mobility.

## DEVELOPMENT OF PASTORALISM AT THE END OF THE FIFTH MILLENNIUM B.C.

Nomadism and mobility were a local traditional behavior of the Zagros population from the Pre-Pottery Neolithic onward, but this phenomenon expanded abruptly at about the end of the fifth millennium.

## EARLY PASTORALISM (PRE-POTTERY NEOLITHIC)

The Zagros Mountains are generally considered to be one of several regions where nomadic pastoralism first emerged. The central part of these mountains and the Khuzistan Steppe have yielded a few Neolithic sites (Ganj

Dareh, Tepe Guran, Sarab, Tepe Tula'i), whose earliest levels of occupation (belonging to the eighth or seventh millennium B.C.) are described as the semi-permanent or seasonal campsites of herders (Henrickson 1985a: 25–26; Hole 1987: 47; Bernbeck 1992; Cribb 1991: 216–18; Abdi 2003: 397, 409). The peripheral location of these sites — which makes them unsuitable for agricultural activities but appropriate for pastoral exploits (Abdi 2003: 409) — the absence of houses, along with a preponderance of sheep and goat bones are the main lines of evidence that suggest an economy based on pastoralism, either transhumant or village based (Hole 1987; Bernbeck 1992).

True agricultural villages also appear in the uplands of the Zagros at about the same time (eighth millennium B.C.), as exemplified by Tepe Abdul Hosein, a village with architecture and ground-stone artifacts (including mortars set in mud stands), located at 1,600 m above sea level in a mountain valley of Luristan (Hole 1987: 49). Sedentism gradually expanded in these mountains by the Late Neolithic and Early Chalcolithic periods. The number of villages increased substantially at the end of the Early Chalcolithic period, reaching its peak at the middle of the fifth millennium (“Early Middle Chalcolithic period,” about 4700–4350 B.C.; Henrickson 1985a; Abdi et al. 2002; Abdi 2003).

#### EXPANSION OF PASTORALISM (MIDDLE CHALCOLITHIC)

In the late fifth millennium, the trend was abruptly reversed, and the number of permanent settlements dropped precipitously in favor of temporary campsites, perhaps as a result of a decline of the agricultural regime. The necessity of increasing mobility to gain access to pastures led to a shift from sedentism to nomadism, and to a pastoral mode of subsistence based on a new social organization revolving around a newly established nomadic identity (Abdi 2003: 397–98). Thus, mobile pastoralism began to be adopted on a wide scale in the Zagros highlands during the latter part of the Middle Chalcolithic period (Henrickson 1985a: 27–33; Abdi 2003: 423–25).

This hypothesis of mobility at the end of the fifth millennium B.C. ties in with the observations concerning the south of the Lake Urmia Basin (Helwing 2005). In the Ushnu-Solduz Valley, which extends to the south of Lake Urmia, there is clear evidence that, at some point around 4000 B.C., many and perhaps all of the villages scattered across the valley floor were abandoned. The area was probably occupied by nomadic pastoralists, as this valley provides excellent resources for herders (Danti, Voigt, and Dyson 2004).

According to Henrickson (1985a: 39–41), the growth of mobile pastoralism in the Zagros highlands was the result of three intertwined processes that occurred during the second half of the Chalcolithic era: population growth, a climatic shift (cooler and wetter following 4600 B.C.), and the economic interest of the emerging lowland polities in highland resources. The general deterioration of the climate at the end of the Middle Chalcolithic period, accompanied by overgrazing, is also emphasized by Abdi (2003), who considers it likely that more and more people turned then to mobile pastoralism as a viable subsistence strategy.

#### CONCLUSION

The Ubaid social and cultural phenomenon has been defined as the first instance of a homogeneous cultural area, despite large regional variability (Frangipane 2001). This phenomenon may have been related to the expansion of political and economic relations with (and influences from) southern Mesopotamian settlements during the Ubaid 3 and Ubaid 4 periods, in coincidence with the emergence of power groups that established forms of control and competition for local and exotic resources (but see, e.g., Karsgaard this volume, for an alternative perspective on the emergence of Ubaid material culture).

With the archaeological data available at present, it is possible to hypothesize the existence of complex societies from the end of the fifth millennium, when processes of social stratification and specialization of production were slowly taking place through unequal access to and manipulation of material and ideological resources (Rothman 2001; Akkermans and Schwartz 2003). This is clear not only in the Syrian and Mesopotamian settlements, but also in the more peripheral areas of eastern Anatolia (Değirmentepe) and possibly also in northern Iran (Helwing 2005). It is also at this time that the long-distance relations between the Mesopotamian lowlands and the surrounding regions of the mountains and highlands, from the Taurus to the Zagros, became more consolidated and continuous than before.

The pottery production of Godedzor fits well into this picture of growing interregional relationships and enlarged cultural horizons. The chaff-tempered production reflects similar technologies that were widespread in the

entire Syro-Mesopotamian and eastern Anatolian region. But while the introduction of these new techniques in these areas could have been related to shifts toward mass production and cost reduction, their use in the settlements of the more peripheral regions may have been related to the needs of the local populations. In the case of Godedzor, the chaff-tempered pottery and its crude technological features may have been well adapted to the production of large amounts of very basic pottery shapes having a short period of use; the least amount of effort, time, and fuel was thus spent for low-cost (and low-value) vessels that were possibly abandoned at the end of the season.

The presence of the north Iranian painted pottery, which among the decorated ceramics is the most common group, and the evidence of mobility suggest that the origins of the communities who settled at Godedzor should be sought in the region of Lake Urmia. The few sherds of Ubaid-like pottery could have been transported by these groups from their places of origin to neighboring areas during seasonal migrations.

Godedzor probably represents one of the northernmost settlements discovered so far, which indicates a clear northern Ubaid-related ceramic horizon. Its ceramic assemblage helps us to define more precisely the northern borders of an area (Iranian Azerbaijan) culturally related to the Ubaid developments taking place in southern and northern Mesopotamia. The site was possibly located on the edges of a region that was within the interaction sphere of the Ubaid-related communities of northwest Iran. To the north, that is in the Lesser Caucasus and the Ararat Plain regions, the local communities were developing at a totally different and autonomous pace (Sioni complex). The borders were probably very fluid and elastic, and not linked to forms of territorial control, being shifting cultural boundaries related to the main activities (in this case specialized pastoralism) carried out by the communities from the Lake Urmia area in short- or medium-range interactions. Thus, these boundaries shifted according to the directions chosen by the local transhumant groups during the course of their seasonal movements.

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#### BIBLIOGRAPHY

- Abdi, K.  
2003 "The Early Development of Pastoralism in the Central Zagros Mountains." *Journal of World Prehistory* 17: 395–448.
- Abdi, K.; G. Nokandeh; A. Azadi; F. Biglari; S. Heydari; D. Farmani; A. Rezaii; and Marjan Mashkour  
2002 "Tuwah Khoshekh: A Middle Chalcolithic Mobile Pastoralist Camp-Site in the Islamabad Plain, West-Central Zagros Mountains, Iran." *Iran* 40: 43–74.
- Akkermans, Peter M. M. G., and Glenn M. Schwartz  
2003 *The Archaeology of Syria: From Complex Hunter-gatherers to Early Urban Societies (c. 16,000–300 B.C.)*. Cambridge: Cambridge University Press.
- Aliev, N., and I. Narimanov  
2001 *The Culture of Northern Azerbaijan in the Late Chalcolithic*. Baku: Agridag. [in Russian]
- Badalyan, R.; Christine Chataigner; and P. Kohl  
2004 "Transcaucasian Obsidian: The Exploitation of the Sources and Their Distribution." In *A View from the Highlands: Archaeological Studies in Honour of Charles Burney*, edited by A. Sagona, pp. 437–65. Ancient Near Eastern Studies Supplement 12. Herent: Peeters.

- Badalyan, R.; Z. Kikodze; and P. Kohl  
 1994 "Neutronic Activation Analysis of Caucasian Obsidian: Sources and Models of Procurement and Distribution (Neolithic Period—Early Iron Age)." In *Izuchenie drevnikh kultur i tsivilizatsij*, edited by V. Masson, pp. 87–92. St. Petersburg. [in Russian]
- Badalyan, R.; P. Lombard; Christine Chataigner; and P. Avetisyan  
 2004 "The Neolithic and Chalcolithic Phases in the Ararat Plain (Armenia): The View from Aratashen." In *A View from the Highlands: Archaeological Studies in Honour of Charles Burney*, edited by A. Sagona, 399–420. Ancient Near Eastern Studies Supplement 12. Herent: Peeters.
- Barge, O., and Christine Chataigner  
 2003 "The Procurement of Obsidian: Factors Influencing the Choice of Deposits." *Journal of Non-crystalline Solids* 323: 172–79.
- Belgiorno, M. R.; R. Biscione; and P. E. Pecorella  
 1984 "Il saggio e i materiali di Tappeh Gijlar." In *Tra lo Zagros e l'Urmia*, edited by P. E. Pecorella and M. Salvini, pp. 241–99. Ricerche storiche ed archeologiche nell'Azerbaijan Iraniano. Rome: Edizioni dell'Ateneo.
- Bernbeck, Reinhard  
 1992 "Migratory Patterns in Early Nomadism: A Reconsideration of Tepe Tula'i." *Paléorient* 18: 77–88.
- Blackman, M. J.; R. Badaljan; Z. Kikodze; and P. Kohl  
 1998 "Chemical Characterization of Caucasian Geological Obsidian Sources." In *L'obsidienne au Proche et Moyen Orient: Du volcan à l'outil*, edited by M.-C. Cauvin, A. Gourgaud, B. Gratuze, N. Arnaud, G. Poupeau, J.-L. Poidevin, and C. Chataigner, pp. 205–31. British Archaeological Reports, International Series 738. Oxford: Archaeopress.
- Cauvin, Marie-Claire, and Christine Chataigner  
 1998 "Distribution de l'obsidienne dans les sites archéologiques du Proche et Moyen Orient." In *L'obsidienne au Proche et Moyen Orient: Du volcan à l'outil*, edited by M.-C. Cauvin, A. Gourgaud, B. Gratuze, N. Arnaud, G. Poupeau, J.-L. Poidevin, and C. Chataigner, pp. 325–50. British Archaeological Reports, International Series 738. Oxford: Archaeopress.
- Chataigner, Christine  
 1995 *La Transcaucasie au Néolithique et au Chalcolithique*. British Archaeological Reports, International Series 624. Oxford: Tempus Reparatum.
- Cribb, Roger  
 1991 *Nomads in Archaeology*. New Studies in Archaeology. Cambridge: Cambridge University Press.
- Danti, M. D.; Mary M. Voigt; and R. H. Dyson  
 2004 "The Search for the Late Chalcolithic/Early Bronze Age Transition in the Ushnu-Solduz Valley, Iran." In *A View from the Highlands: Archaeological Studies in Honour of Charles Burney*, edited by A. Sagona, pp. 583–616. Ancient Near Eastern Studies Supplement 12. Herent: Peeters.
- Dyson, R. H., and T. Cuyler Young, Jr.  
 1960 "The Solduz Valley, Iran: Pisdeli Tepe." *Antiquity* 34: 19–28.
- Frangipane, Marcella  
 2001 "Centralization Processes in Greater Mesopotamia: Uruk 'Expansion' as the Climax of Systemic Interactions among Areas of the Greater Mesopotamian Region." In *Uruk Mesopotamia and Its Neighbors: Cross-cultural Interactions in the Era of State Formation*, edited by M. S. Rothman, pp. 307–48. Santa Fe: School of American Research Press.
- Hamlin, C.  
 1975 "Dalma Tepe." *Iran* 13: 111–28.
- Helwing, Barbara  
 2004 "The Late Chalcolithic Period in the Northern Zagros: A Reappraisal of the Current Status of Research." In *Proceedings of the International Symposium on Iranian Archaeology: Northwestern Region*, edited by M. Azarnoush, pp. 11–24. Tehran: Iranian Center for Archaeological Research.

- 2005 "Early Complexity in Highland Iran: Recent Archaeological Research into the Chalcolithic of Iran." *Tüba-Ar* 8: 39–60.
- Henrickson, Elizabeth F.
- 1983 Ceramic Styles and Cultural Interaction in the Early and Middle Chalcolithic of the Central Zagros, Iran. Ph.D. Dissertation, University of Toronto. Ann Arbor: University Microfilms International.
- 1985a "The Early Development of Pastoralism in the Central Zagros Highlands (Luristan)." *Iranica Antiqua* 20: 1–42.
- 1985b "An Updated Chronology of the Early and Middle Chalcolithic of the Central Zagros Highlands, Western Iran." *Iran* 23: 63–108.
- 1989 "Ceramic Evidence for Cultural Interaction between the 'Ubaid Tradition and the Central Zagros Highlands, Western Iran." In *Upon this Foundation: The 'Ubaid Reconsidered* (Proceedings from the 'Ubaid Symposium, Elsinore, May 30th–June 1st, 1988), edited by E. F. Henrickson and I. Thuesen, pp. 369–99. Carsten Niebuhr Institute of Ancient Near Eastern Studies Publications 10. Copenhagen: Museum Tusulanum Press.
- Hole, Frank
- 1987 "Archaeology of the Village Period." In *The Archaeology of Western Iran: Settlement and Society from Prehistory to the Islamic Conquest*, edited by F. Hole, pp. 29–78. Smithsonian Series in Archaeological Inquiry. Washington, D.C.: Smithsonian Institution Press.
- Jasim, Sabah A.
- 1985 *The Ubaid Period in Iraq*. Oxford: British Archaeological Reports, International Series 267. Oxford: British Archaeological Reports.
- Keller, J.; R. Djerbashian; S. Karapetian; E. Pernicka; and V. Nasedkin
- 1996 "Armenian and Caucasian Obsidian Occurrences and Sources for the Neolithic Trade: Volcanological Setting and Chemical Characteristics." In *Archaeometry 94: Proceedings of the 29th Symposium on Archaeometry*, edited by S. Demirci, A. M. Özer and G. Summers, pp. 69–86. Ankara: Tübitak.
- Keller, J., and C. Seifried
- 1990 "The Present Status of Obsidian Source Identification in Anatolia and the Near East." In *Volcanologie et Archéologie*, edited by C. Albore Livadie and F. Wideman, pp. 58–87. Part 25. Strasbourg: Conseil de l'Europe.
- Kiguradze, T.
- 2000 "The Chalcolithic Early Bronze Age Transition in the Eastern Caucasus." In *Chronologies des pays du Caucase et de l'Euphrate aux IV<sup>e</sup>–III<sup>e</sup> millénaires*, edited by C. Marro and H. Hauptmann, pp. 321–28. Paris: de Boccard.
- Kiguradze, T., and A. Sagona
- 2003 "On the Origins of the Kura-Araxes Cultural Complex." In *Archaeology in the Borderlands: Investigations in Caucasia and Beyond*, edited by A. Smith and K. Rubinson, pp. 38–94. Los Angeles: Cotsen Institute of Archaeology.
- Kroll, Stephan E.
- 2002 "Metalle und Metallurgie in Nordwest-Iran und Armenien im Chalkolithikum und in der Frühen Bronzezeit." In *Anatolian Metal II*, edited by Ü. Yalçın, pp. 131–35. Der Anschnitt 15. Bochum: Deutsches Bergbau-Museum.
- Lisitsyna, G. N., and L. V. Prischepenko
- 1977 *Palaeoethnobotanical Finds in the Caucasus and the Near East*. Moscow: Nauka. [In Russian]
- Lombard, P., and Christine Chataigner
- 2004 "Le Néolithique et le Chalcolithique en Transcaucasie: L'exemple des bassins de la Kura et de l'Araxe." In *Aux marges des grands foyers du Néolithique: Périphéries débitrices ou créatrices?*, edited by J. Guilaine, pp. 61–84. Paris: Errance.
- Mkrtumyan, Yu. I.
- 1974 "Types of Herding in Eastern Armenia." *Ethnography and Folklore of Armenia* 6: 7–92. Yerevan. [In Russian]

- Narimanov, I. G.  
1987 *The Culture of the Earliest Farmers and Herders in Azerbaijan: The Chalcolithic Period 6th–4th Millennium B.C.* Baku: Elm. [In Russian]
- Renfrew, Colin, and J. E. Dixon  
1976 “Obsidian in Western Asia: A Review.” In *Problems in Economic and Social Archaeology*, edited by G. de Sieveking, I. Longworth, and K. Wilson, pp. 137–50. London: Duckworth.
- Renfrew, Colin; J. E. Dixon; and J. R. Cann  
1966 “Obsidian and Early Cultural Contact in the Near East.” *Proceedings of the Prehistoric Society* 32: 30–72.
- Rothman, Mitchell S.  
2001 “The Tigris Piedmont, Eastern Jazira, and Highland Western Iran in the Fourth Millennium B.C.” In *Uruk Mesopotamia and Its Neighbors: Cross-cultural Interactions in the Era of State Formation*, edited by M. S. Rothman, pp. 349–401. Santa Fe: School of American Research Press.
- Rova, E.  
1999–2000 “A Tentative Synchronization of the Local Late Chalcolithic Ceramic Horizons of Northern Syro-Mesopotamia.” *Mesopotamia* 34/35: 175–201.
- Safar, Fuad; Mohamed A. Mustafa; and Seton Lloyd  
1981 *Eridu*. Baghdad: Ministry of Culture and Information.
- Schachner, Andreas  
2002 “Zur Entwicklung der Metallurgie im östlichen Transkaukasien (Azerbaycan und Nahçevan) während des 4. und 3. Jahrtausends v. Chr.” In *Anatolian Metal II*, edited by Ü. Yalçın, pp. 115–30. Der Anschnitt 15. Bochum: Deutsches Bergbau-Museum.
- Schwartz, Glenn M.  
1988 *Aceramic Chronology from Tell Leilan: Operation I*. New Haven and London: Yale University Press.
- Stein, Gil J.  
1994 “Economy, Ritual and Power in ‘Ubaid Mesopotamia.’” In *Chiefdoms and Early States in the Near East: The Organizational Dynamics of Complexity*, edited by G. J. Stein and M. S. Rothman, pp. 35–46. Monographs in World Archaeology 18. Madison: Prehistory Press.
- Tobler, Arthur J.  
1950 *Excavations at Tepe Gawra, Volume 2: Levels IX–XX*. Publications of the Baghdad School, Excavations 1. Philadelphia: University of Pennsylvania Press.
- Tomé, C.  
2005 “Étude de la faune de Godedzor.” In *Rapport 2005 de la mission Caucase*, edited by C. Chataigner, pp. 121–30. Lyon: Centre National de la Recherche Scientifique.
- Trufelli, F.  
1997 “Ceramic Correlations and Cultural Relations in IVth Millennium Eastern Anatolia and Syro-Mesopotamia.” *Studi Micenei ed Egeo Anatolici* 39: 5–33.
- Varazashvili, V.  
1992 *The Early Agricultural Culture of the Iori-Alazani Basin*. Tbilisi: Metsniereba. [In Russian]
- Voigt, Mary M.  
1983 *Hajji Firuz Tepe, Iran: The Neolithic Settlement*. University Museum Monograph 50. Philadelphia: University of Pennsylvania.
- Voigt, Mary M., and R. H. Dyson  
1992 “The Chronology of Iran, ca. 8000–2000 B.C.” In *Chronologies in Old World Archaeology*, edited by R. Ehrich, Volume 1, pp. 122–78. Chicago: University of Chicago Press.