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Trade and interaction during the era of the Uruk expansion: Recent insights from archaeometric analyses

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ABSTRACT

The papers in this special issue apply archaeometric methods to one of the perplexing problems of prehistory: the spread of material culture out of Lower Mesopotamia into the surrounding plains and highlands ca. 3500–3100 BCE. Although archaeologists debate the cultural and historical processes underlying this spread, one influential model, Algaze's Uruk Expansion hypothesis, suggests that the widespread appearance of Uruk and Uruk-related material culture represents both movements of people and the extensive exchange of goods throughout greater Mesopotamia and into neighboring regions in Anatolia and Iran. Here we utilize robust methods of provenance determination, including trace-element and isotopic characterization, to examine the possible movement of basic commodities such as pottery, bitumen, and sealed containers among key Uruk and contemporaneous Iranian Proto-Elamite sites. As a group these papers provide significant new data regarding the types of interactions and contacts that did – and did not – take place in the Late Uruk and Proto-Elamite world.

During the later 4th millennium BCE, the material culture of Lower Mesopotamia began to appear in southwestern Iran, northeastern Syria, southeastern Turkey, and highland Iran at distances of >1000 km from the alluvial plain (Algaze, 1989, 1993; Table 1). The Lower Mesopotamian material includes ceramics in distinctive forms (beveled-rim bowls, jars with nose-lugs or droop spouts), decorative techniques (cross-hatched incising), and surface treatments (reserve slip decoration), as well as administrative technology (clay seals, tokens, numerical tablets) and forms of architecture. Similar material culture was also distributed throughout the highlands of Iran as part of the largely contemporaneous Proto-Elamite phenomenon (Petrie, 2013:15–18). Although variable in both spatial extent and content, it is evident that this spread of material culture represents more than isolated trade, in some cases suggesting colonization and wholesale replacement of local cultures.

In a path-breaking synthesis, Guillermo Algaze (1989, 1993) termed the spread of southern-style artifacts and technologies the "Uruk expansion" and offered an initial interpretation framed within a world system perspective. Specifically, he argued that the expansion represented a system of asymmetrical economic interactions in which the politically and culturally advanced polities of Lower Mesopotamia attempted to extract valuable raw materials originating in the hinterlands to the north and east. Through the establishment of trading enclaves and outposts along key trade routes to the uplands, high-value goods such as copper, gold, silver, lead, lapis lazuli, and alabaster, as well as building products such as massive roof timbers and limestone, were directed to the cultural and political core. In exchange, Algaze (1993:74–75) suggested that Lower Mesopotamia exported manufactured commodities and agricultural produce; such items might have included textiles and possibly bulk grain, as well as liquids such as oil, wine, honey, and perhaps a fermented, salty fish sauce similar to the Roman *garum*. In accordance with this model, it is tempting to see the distribution of Uruk-style pottery (particularly jars and bottles) as containers for these exports from Mesopotamia, and to interpret their presence in outlying areas as reflecting a substantial movement of goods and commodities between regions. Algaze, however, was more cautious: "Whether or not the various types of Uruk ceramics recovered in the highlands were acquired for their contents is unclear. The answer is likely to depend on the function of each of the types involved … not every example need be an actual import" (Algaze, 1993:74).

While the phenomenon of the Uruk expansion has been widely acknowledged, the processes underlying this expansion continue to be debated (Lupton, 1996; Petrie, 2013; Postgate, 2002; Rothman, 2001a). In light of more recent excavations documenting social complexity and substantial urban centers in the north that predate the arrival of southern influence (e.g., Frangipane, 2001, 2007, 2012; Oates et al., 2007; Rothman, 2001b), many scholars now understand the initial world system model to have overstated the degree of regional

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Table 1
Relative chronology for sites and regions examined in this issue.

Dates BC	Lower Meso-potamia	Susiana	Middle Euphrates	Tell Brak	Hacınebi	Godin Tepe	Fars (KRB)	Tepe Yahya
2000	Ur III					III	Kaftari	IV B
2100				Akkadian				
2200	Akkadian	Susa IV						
2300								
2400	Early Dynastic III						B/K Transitional	
2500				Ninevite 5				
2600					Early Bronze			?
2700	Early Dynastic I					IV		
2800							Late Banesh	
2900		Susa III/ Proto-Elamite						IV C (Proto-Elamite)
3000	Jemdet Nasr			Post-Uruk			Middle Banesh (P-E)	
3100			Jebel Aruda & Habuba Kabira			VI:1 / V		
3200	Late Uruk			LC5				?
3300						VI:2	Early Banesh	
3400	Middle Uruk				Phase B2			
3500		Susa II		LC4			Transitional	
3600				LC3			Lapui	V
3700								
3800					Phase B1			
3900	Early Uruk (LC2)			LC2	Phase A	VI:3 - VII		
4000								

inequality. Others have questioned the ability of southern city-states to maintain such a far-flung economic empire, suggesting instead a trade diaspora in which foreign merchants were present at the behest of the local ruling elites to their mutual advantage (Stein, 1999, 2001, 2002). Still other scholars have argued against an economic basis for the Uruk expansion, suggesting several additional (and in some cases overlapping) processes that may account for the interactions between the Mesopotamians and their neighbors (Postgate, 2002; Rothman, 2001a). Possible alternatives to interregional trade include the implantation of colonies to exploit agricultural land (Schwartz, 2001), the emigration of refugees fleeing conflict or political instability in Mesopotamia (Johnson, 1988–1989), the movement of material culture between regions by pastoral nomads (Abdi, 2003), acculturation resulting from long-term contact between adjacent regions (Alizadeh, 2010; Johnson, 1973), emulation of Lower Mesopotamia by local elites attempting to increase their status (Stein, 2001), or perhaps the spread of a world view grounded in the special depth and potency of Mesopotamia's relations with the divine (Petrie, 2013:13; Collins, 2001). In short, we have yet to reach consensus as to whether the appearance of southern-styled artifacts and technologies "represents colonization by Southerners, trade, or emulation" (Rothman, 2001a:21).

Further east and slightly later in time, the Proto-Elamite "phenomenon" is less well understood, although it was clearly related to the Uruk expansion. The complex of Proto-Elamite material culture included mass-produced ceramics broadly similar to those of the Uruk world as well as clay tablets with a different script and cylinder seals and other art produced in distinctive styles. From its two apparent centers—the lowland city of Susa and the highland urban center of Malyan—Proto-Elamite material was found over an extensive area of northern and southern Iran in the context of differing local cultures. As with the Uruk world, trade and mobility have long been taken to be central to the Proto-Elamite phenomenon (Alden, 1982).

In evaluating the various alternative models for these phenomena, a critical first step is to establish whether similarities in material culture result from the actual exchange or movement of goods or from the sharing of information and cultural traditions among regions; a second important step is to identify the spatial scale over which trade contacts operated. Chemical and isotopic-based analyses can play a major role in this process by establishing the source of goods and enabling us to trace their movement from producer to consumer. Although these provenance methods are well established, they have been under-utilized in the ancient Near East. The limited studies that exist have largely focused on clearly exotic (and usually high value) materials, primarily obsidian (Blackman, 1984; Blackman et al., 1998; Bressy et al., 2005; Frahm, 2014; Nadooshan et al., 2013), but also chlorite (Kohl, 1975; Kohl et al., 1979), carnelian (Kenoyer, 1997, 2008), and copper (Morr et al., 2013; Yahalom-Mack et al., 2014; Yener et al., 1991), or administrative items such as clay seals, sealings, and tablets (Blackman, 1985, 2003; Rothman and Blackman, 1990; Goren et al., 2011). In contrast, archaeometric studies have generally ignored more routine items and their movement over less impressive distances (see, however, work on bitumen by Connan and Van de Velde, 2010; Schwartz and Hollander, 2008). Relatively few ceramic provenance studies have been carried out within the geographic sphere of the Uruk expansion, and even fewer have been applied to the issue of interregional exchange (see Minc, this issue, for a review). Yet pottery accounts for the vast majority of evidence for an Uruk presence outside the southern Mesopotamian heartland.

The papers included in this issue were thus designed to gauge the extent and spatial scale of exchange in the Uruk and Proto-Elamite worlds, and to explore the processes underlying the spread of these material culture items and styles. The majority of the papers result from a collaborative project sponsored by the Oregon State University (OSU) Archaeometry Lab and funded by the National Science Foundation. These papers focus on Uruk and Proto-Elamite style ceramic vessels dating to the later 4th millennium BCE, and utilize chemical analyses of ceramic pastes to establish their provenance and to track their movement among sites. Working in collaboration

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