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CHAPTER 7

Ceramic Production in the Central Highlands of Yemen During the Islamic Period

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Ceramic production in rural contexts of the Islamic world has been understudied. The usually unglazed products from this zone have often been overshadowed in the analyses of archaeological pottery assemblages in favor of focusing on the provenance or technology of sherds with more complex surface treatments or fabric compositions that were created in workshops associated with urban centers. As a result, knowledge of the extent and nature of this significant aspect of the rural economy is quite limited, despite research in Greater Syria and Upper Egypt demonstrating the importance of noncommercial manufacture for the economic independence of inhabitants in rural regions (Milwright 2010: 154–56). The production of local wares does not necessarily represent technological backwardness or economic destitution but rather may be a conscious choice by a rural population to maintain a self-sufficient autonomy. At the same time, while rural ceramic production may primarily serve the needs of local consumers, that does not mean the products are limited to basic handmade wares in domestic contexts. Rather, it may also include more specialized production of vessels that require the potter to have a higher level of skill and time for their manufacture. This chapter focuses on a case study of a diverse industry of pottery production that provides for the needs of a rural population located in the central highlands of Yemen.

The study of Islamic period ceramics in Yemen has largely concentrated on establishing links to other world regions in order to contextualize it within a wider global sphere of interaction. Pottery collected through survey and excavation that had demonstrably been produced in foreign centers demonstrates connections to a wide variety of locations in the Near East, East Africa, South Asia, and East

Asia. While this evidence counters the notion of Yemen's apparent isolation on the southern tip of the Arabian Peninsula, it is also a consequence of the coastal location where most archaeological research has been pursued. Beginning with a survey in 1941 of the area around the major port of Aden (Lane and Serjeant 1948), the majority of the Islamic period projects have taken place in regions along or close to the coasts of the Indian Ocean and the Red Sea, where the material remains reflect the local population's direct integration into a network of interregional commerce (Hardy-Guilbert 2005; Hardy-Guilbert and Rougeulle 1995, 1997; Keall 1983; King and Tonghini 1996; Newton 2009; Rougeulle 2005; Whitcomb 1988). While this archaeological work has succeeded in producing a valuable temporal framework of externally and locally produced glazed wares, the sampling bias created by the location of the data collection has resulted in an emphasis on pottery manufactured in foreign locations in lieu of focusing more on the local ceramic industries. Conversely, the Dhamar Plain situated in the interior highlands offers an important comparative counterpoint for a wider comprehension of the variability in the ceramic record across South Arabia as a whole. Despite its central location within Yemen, there is limited evidence for the integration of this rural area into a wider network of exchange. Instead, its pottery points to a strong regional tradition of local ceramic production that has maintained relative coherence for millennia.

The Regional Context and Local Economies of the Dhamar Plain

At an elevation of roughly 2,300 to 2,600 meters above sea level, the Dhamar Plain is located on a plateau in the central highlands of Yemen between the Yislah and Sumara mountain passes (Fig. 7.1). Approximately 100 kilometers south of Sanaa, Dhamar, its main settlement, lies alongside a north-south transportation route that has served as a major conduit for the movement of goods and people between the southern coast and the northern highlands at least as early as the third millennium BCE (Wilkinson 2003: 163–64). During the Islamic period, the rural population of the Dhamar Plain was not politically united under an indigenous dynasty but was divided into various sedentary tribes that sought to maintain their independence from intruding states, such as the Ayyubids, Rasulids, Ottomans, and Qasimis. Textual accounts provide multiple examples of the local population's submission to these outside aggressors and their subsequent rebellion against them. The settlement record reflects this continual conflict through a variety of examples of fortified architecture, such as tower houses, walled villages, and citadels, but without clear indication of an overarching program of defense and administration

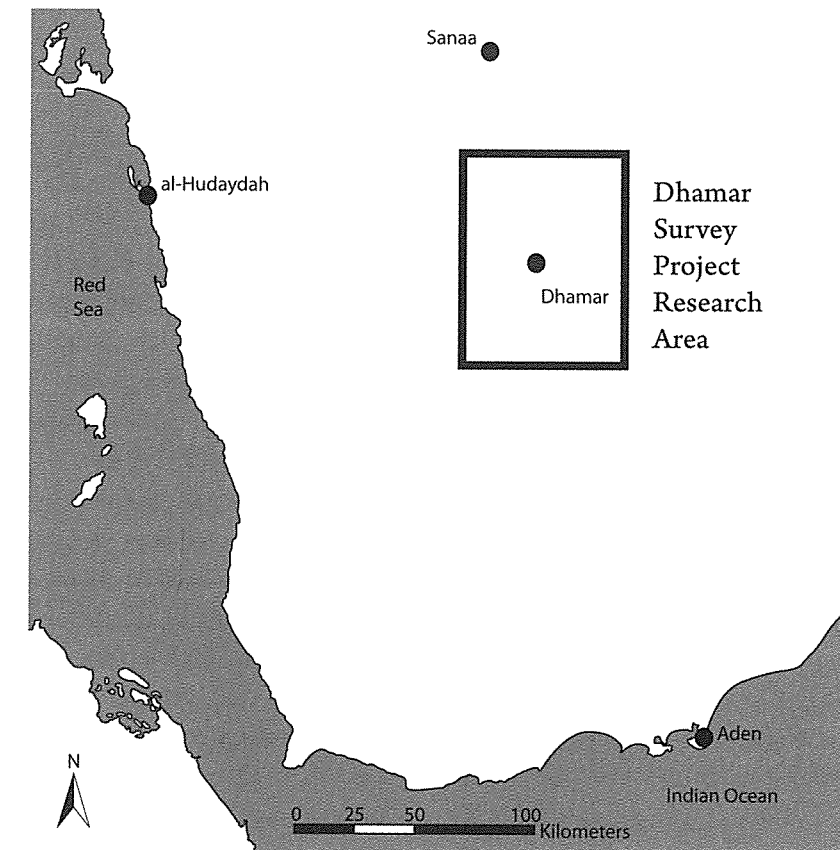


Figure 7.1 Map of the Dhamar Survey Project location (prepared by author).

created by an external power. Hence, this evidence points to a more disjointed sociopolitical landscape involving numerous factions rather than one dominated by a single center or political group. This scattered autonomy also corresponds to the diversity of the economic practices of this rural region.

Agricultural cultivation of barley, wheat, and sorghum has been the main economic activity of the population of the Dhamar Plain for millennia (Edens 2005). As a result, extensive systems of terracing, dams, cisterns, and wells cover most of the arable land in the region. Archaeological investigation of them has shown that in the pre-Islamic period, the more limited field and water management systems maintained by smaller groups have been more resilient than the systems involving monumental works sponsored by larger political entities (Gibson and Wilkinson 1995). Additionally, together with the vast plains of Sanaa and Hasi, the Dhamar Plain was a principal location in the medieval period for the breeding of horses to be exported to the south for sale. They were first sold to the Rasulid sultan who controlled the port of Aden and later to the Baniyan merchants from India (Vallet

2010: 373–78). Finally, owing to its volcanic landscape, this region is also rich in various mineral resources, including sulfur, which was mined from a mountain approximately fifteen kilometers to the east of Dhamar for use in gunpowder during the first Ottoman occupation in the seventeenth century (Luṭf Allāh 2003: 275–76).

Craft production was also an important part of the economy of the Dhamar Plain. A thirteenth-century Rasulid administrative document, called *Nūr al-ma'ārif fi nuḥum wa-qawānīn wa-a'rāf al-Yaman fi al-'abd al-muḥaffarī al-wārif*, contains a section describing the market of Dhamar, revealing the variety of crafts that were undertaken in and around it (Jāzim 2003: 245–47). This inventory of merchandise includes embroidered garments and curtains of various qualities, incense burners, and glass vessels. In addition, there is a reference in this document to a goldsmith in Dhamar named Muhammad b. 'Alī b. 'Amran (Jāzim 2005: 175). Nonetheless, the craft items occurring most often by far in the list are various types of ceramic vessels along with their sizes and prices. These vessels range from small cups (*al-tāsāt*), to larger water jars (*al-kizān*), to containers for vegetables (*al-qulaylāt*), to many other types whose identification and function remain ambiguous. While this textual description provides clear evidence for a strong local ceramic industry involving various types of standardized wares, other information, such as their physical attributes, styles, or places and types of production, is not stated. Consequently, the exploration of the archaeological record enables the investigation of these details as well as a more well-rounded understanding of the local pottery production as a whole.

The Dhamar Survey Project Collection of Islamic Period Ceramics

From 1994 to 2008, the Dhamar Survey Project located over 400 sites from all occupation periods in an extensive regional survey, consisting of systematic field-walking in blocks adapted to the contours of the Dhamar Plain's irregular topography (Edens 1999; Gibson and Wilkinson 1995; Lewis 2005a; Wilkinson and Edens 1999; Wilkinson et al. 1997). The majority of the 191 sites containing Islamic period remains are small hamlets dispersed among the extensive agricultural systems, often on elevated locations above the arable terrain (Mahoney 2014). There are also larger villages composed of clusters of houses and sometimes a small mosque, as well as citadels and watchtowers scattered throughout the plain. Dhamar was the largest settlement of the region during the Islamic period, but its urban nature may be put into question for much of this duration. The tenth-century geographer al-Hamdani refers to it as a large village (1989: 206), and the twelfth-century geographer al-Idrisi describes it as a small settlement with a few houses and limited population (1989: 53–54). Continuing into the seventeenth century,

European travelers passing through the plain emphasize its appearance as a cluster of separate villages rather than one city (Jourdain 1906: 86–87; Middleton 1732: 270). Not until the second half of the eighteenth century does Dhamar seem to have coalesced into an integrated urban fabric with multiple neighborhoods and a university (Niebuhr 1792: 362). Thus, the local ceramic industry emerges from what seems to be a mostly (if not entirely) rural context until the later Islamic period.

I studied sherds from 101 sites or components within sites, from which solely Islamic period material was collected, and created the first typology of Islamic period ceramic forms from the central highlands of South Arabia. Consisting mostly of vessel forms for domestic use or storage, the most common types comprise such open forms as platters, shallow bowls, medium bowls, deep bowls, and globular bowls; straight-sided forms; such closed forms as slightly closed forms and hole-mouth jars; and jars with varied types of necks. There are also flat, rounded, and ring bases, as well as strap, lug, loop, and applied handles. Finally, the collection includes one folded and three circular spouts, numerous decorated sherds with a variety of surface treatments, and fragments of smoking pipes.

There are some superficial similarities with the Islamic period assemblages from other regions of South Arabia, such as wavy-line incisions and the general repertoire of vessel forms, but their rim shapes, fabric composition, and other decorative techniques are quite different. The local material in the area of Aden at the sites of al-Jebelain, al-Qaraw, Khanfar, and Kawd am-Saila (Whitcomb 1988: 206–209, 222–29) consists of red or red-brown ware with wavy-combed incisions, but the rim shapes of the bowls and jars, cream slip, and other decorative techniques of modeling, incision, excision, and stamping are different from the Dhamar Plain material. Additionally, the sites from the interior of the Hadramawt in eastern Yemen (Whitcomb 1988: 210–21, 230–41) contain some of the same basic vessel forms and wavy-line incisions, but also have unfamiliar rim shapes, decoration, cream slips, and fabrics of buff, orange, grey, and black color. The local nonglazed redware from the coastal Hadramawt region near Sharma (Rougeulle 2007) has similar wavy-combed incisions as well as vessel forms of long-necked jars, deep basins, and medium bowls, but their rim shapes, thin cream slip, and red-painted decoration do not correspond to the Dhamar Plain sherds. Finally, some of the forms of the nonglazed pottery of the ninth to eleventh century from the sites in the Tihama along the Red Sea coast (Ciuk and Keall 1996) have clear parallels, such as short-necked jars (60–63), modeled-neck jars (68–69), deep and globular bowls (80–83), and carinated vessels with lug handles (94–95), although many of the specific rim shapes, fabrics, and slips are different. From the eleventh century onward, however, much of the unglazed pottery from this region, which has a more intricate incised and excised decoration termed trackware (Mason and Keall 1988), is not found in the Dhamar material, which generally has simpler decorative designs.

The distinctiveness of the Dhamar Survey Project collection is further reflected in the small number of sherds originating from outside of the region, despite the major north–south route passing through it. These include 16 sherds of porcelain and 89 sherds of a green and gold fineware associated with coffee drinking that was produced at the site of Hays on the Red Sea coast from the sixteenth century onward (Keall 1992; Mason and Keall 1988). Additionally, 12 sherds of other glazed ware, including blue-and-white ware and turquoise slip-painted ware, compare to pottery produced in the kilns of the Tihama region (Mason 1991; Ciuk and Keall 1996). Altogether, the 117 sherds of glazed ware make up only 3 percent of the total survey collection, demonstrating their very limited presence in the region. The spatial distribution of the thirty-three single period sites with glazed wares and the twenty-five single period sites with specifically Haysi ware are fairly uniform throughout the area. However, the eight single period sites with porcelain, mostly clustered along the north–south route, may indicate its closer connection to sites associated with long-distance travel and exchange instead of settlements where it would have been utilized by the communities living in the region. A final piece of material evidence showing clear interaction with groups from outside of the area are the 14 fragments of Ottoman tobacco pipes found at eight single period sites in the southern portion of the plain. Although they are lower in quality compared to pipes found in the Tihama (Keall 1992), their presence indicates the extension of smoking culture into the region in the early seventeenth century. Nonetheless, this collection overall seems to reflect a well-delimited ceramic industry, in which the majority of the pottery was produced and consumed within the region.

Examining this regional collection, there are many similar vessel forms that are found in previous occupation periods in the plain, such as thick platters, medium bowls, and straight-sided forms, slightly closed and hole-mouth storage vessels, and thick lug and loop handles. This pattern reinforces a general trend of continuity in ceramic production extending back to the third millennium BCE, which has been discussed in previous examinations of the Dhamar Survey Project collection as a whole (Lewis 2005a, 2005b). However, there are also innovations in the pottery of the Islamic period, including the emergence of new specialized vessel forms, the more frequent application of a burnished slip, and the greater use of an abundant mixture of both chaff and mineral inclusions. There is also a wider diversity in the shapes of rims, such as rounded, pinched, flat, inverted, everted, upturned, externally thickened, internally thickened, hammerhead, side-grooved, and top-grooved, as well as a more diverse range of decorative techniques including sherds that were incised, ridged, combed, pattern burnished, notched, applied, painted, impressed, pierced, corded, and punctated.

Despite these innovations, internal periodization of the Dhamar Survey Project collection within the Islamic period continues to be difficult due to the lack of

excavation of Islamic period contexts in the Dhamar Plain, which would provide a secure stratigraphic sequence or more direct methods for dating this material more precisely. Similarly, due to the inexact and minimal parallels with the ceramics from the Indian Ocean and Red Sea coastal regions, dating them through stylistic comparison is problematic. As a result, the sherds generally are interpreted as being produced, utilized, and discarded at some point between the seventh and twentieth centuries. However, for some sherds, there are indications for more precise dating within this temporal breadth. For example, some have a deep-red burnished slip similar to pottery of the pre-Islamic Himyarite period, while some have very high-fired fabrics containing pure-white mineral inclusions connected to ceramics of the Late Islamic period. Another type of very high-fired pottery of the Late Islamic period was termed purple-painted ware by the survey team and is currently still being made and sold in markets all over Yemen. A comparative assemblage of this type, presently stored in the British Museum, was collected in the southern regions of the country during the mid-twentieth century (Posey 1994). In the Dhamar Survey Project collection, this ware has a hard brown fabric with an oxidized core and abundant chaff and mineral inclusions, which occasionally consists of only white grit. Its surface is covered by a slip of buff, light-red, or orange color on which is painted a design of diagonal and horizontal bands of dark purple, brown, or black color. With internally thickened and rounded rims of fifteen to twenty centimeters in diameter, most of its forms are hole mouths or slightly closed but also include medium bowls. Finally, the local unglazed ware may be dated based on the additional presence of nonlocal ceramics, such as the aforementioned glazed wares (including Haysi ware) and Ottoman tobacco pipes, in the individual collections from specific sites. However, no clear patterns have yet emerged from this comparison, possibly owing to the long-term occupation at the sites themselves. Thus, while a more specific periodization remains elusive because of the nature of the data set, the apparent temporal consistency of many of the forms found in the collection does mirror the wider trend of continuity for the ceramic tradition of the Dhamar Plain over millennia.

The Diversity of Ceramic Production in the Dhamar Plain

The concept of craft specialization in the Islamic period has generally been reserved for professional workshops associated with urban centers where they directly produce their wares for a particular institution or patron, or sell them to multiple consumers in a market setting. Rural areas, on the other hand, are generally associated with a lower-level domestic sphere of production. This arbitrary

dichotomy, however, does not correspond to a more complex reality in which specialized production may also be part of rural craft manufacture. In this way, specialization in ceramic production is identified in the archaeological record based on more specific criteria. These include direct indications, such as the identification of workshops and their technological implements, and indirect indications, such as the standardization of the ceramics themselves based on the homogeneity of their morphological, stylistic, and compositional attributes as well as the extent of their distribution across various sites (Costin 1991, 2001).

While the thirteenth century *Nur al-ma'arif* (Jāzīm 2003, 2005) and the seventeenth-century *Qānūn San'ā'* (Serjeant and al-Akwa' 1983) provide textual evidence for the specialized production of ceramics in both rural and urban contexts of Yemen, archaeological investigation has also located pottery workshops in the coastal regions of the Tihama and Hadramawt. In the Tihama, petrographic analysis of the local pottery isolated four different centers of production at sites in the vicinities of the cities of Zabid and Hays (Mason and Keall 1988). While much of the locally produced glazed ware of the later Islamic periods came from Hays, all of the nonglazed ware of the ninth to the eleventh century, comparable to the Dhamar Plain material, came from the Zabid East site, where a kiln with wasters was exposed in excavation (Mason 1991: 191–92). In the Hadramawt, a rural production center for the local redware on the Indian Ocean coast was located at the site of Yadhghat, about twelve kilometers north of the port of Sharma (Rougeulle 2007). Dated from roughly the Abbasid period to the mid-twelfth century, this site contained large piles of kiln refuse in an open area where the pottery was fired directly upon the ground, as well as a three-meter-deep shaft to the southeast crossing a layer of pure red clay that was suspected to be the source of the red paint used for the vessels' surface decoration.

When examining the ceramic collection from the Dhamar Survey Project, a complex rural industry involving different levels of production emerges. While the majority of the sherds appear to be well formed and fired at a high temperature, the wide diversity in their rim shapes, fabric composition, and decoration does not point to a uniform standardization in their production. Some of this variety is the result of a lack of strong periodization for the long breadth of time from which the assemblage comes, but some also is likely the outcome of a more geographically dispersed level of production. At the same time, however, other wares in the Dhamar Survey Project collection indicate a higher level of standardization that demands increased skill from the potter and more time for the steps of manufacture. Among them, three types in particular point to a specialized production due to the consistency of the vessel forms, surface decoration, fabric composition, and spatial distribution in the plain: they are top-grooved ware, modeled ware, and al-Lisi ware.

Top-grooved ware (Fig. 7.2 a, b) is most easily identified based on its titular incision carved into the top of the rim, but it is not a ubiquitous attribute. In the collections from the same sites, there are also grooveless sherds that have all of the other diagnostic aspects of this type. With rim diameters of fifteen to twenty-five centimeters, the most common vessel forms are hole mouths and other closed forms, but there are also jars with varying lengths of necks. The brown and red high-fired fabric with mostly oxidized cores and fair to abundant mixed mineral inclusions enable the construction of its extremely thin (usually less than one centimeter) and hard vessel walls. Its surface is often slipped or slipped and burnished, and its decoration consists of applied thin horizontal ridges with notches or impressions in addition to vertical or diagonal combed incisions. Top-grooved ware was found distributed across the plain at thirty-four single period Islamic sites. While a specific site of production has not yet been found for this ceramic type, there are two sites with exceptionally high concentrations of it that are located more than twenty kilometers, respectively, to the east and south of Dhamar, pointing to a rural context for its manufacture.

Modeled ware (Fig. 7.2 c, d), a second example of specialized ceramic production in the Dhamar Plain, is usually a straight-sided form. With a rim diameter of fifteen to thirty-five centimeters, its very specific rounded morphology consists of both internal and external thickening. Additionally, a thin horizontal ridge roughly two centimeters below the rim may also incorporate a lug handle. It is covered by a smooth brown slip, and its brown fabric, consisting of occasional fine chaff and mineral inclusions, has a reduced core. Modeled ware was found at six single period Islamic sites clustered in the southern portion of the plain over fifteen kilometers away from Dhamar, also indicating a probable rural context for its production, although a specific site has not yet been located.

Finally, al-Lisi ware (Fig. 7.2 e, f; Fig. 7.3) is the clearest example of specialized ceramic production in the Dhamar Plain. With a rim diameter of twenty-five to thirty-five centimeters, it consists of globular and carinated forms with round rims and thick walls. It often has a large, rounded horizontal ridge and occasionally a lug handle. Its decoration includes a wavy-line incision, vertical incisions, or impressions along the upper part of its body. Its thick red-slipped and burnished surface covers a red fabric with a commonly oxidized core, containing a coarse mixture of abundant chaff and mixed minerals. The site of its production is situated at the base of al-Lisi mountain, which is located fifteen kilometers east of Dhamar. Here, a great number of sherds of this type were found during the survey, along with ceramic wasters and kilns. Incidentally, at the top of the mountain, there is a large early seventeenth-century Ottoman fort, in which the previously cited sulfur-mining operation took place. There is no direct evidence that connects these two industrial work sites, but the heavy-duty nature of al-Lisi ware's fabric may

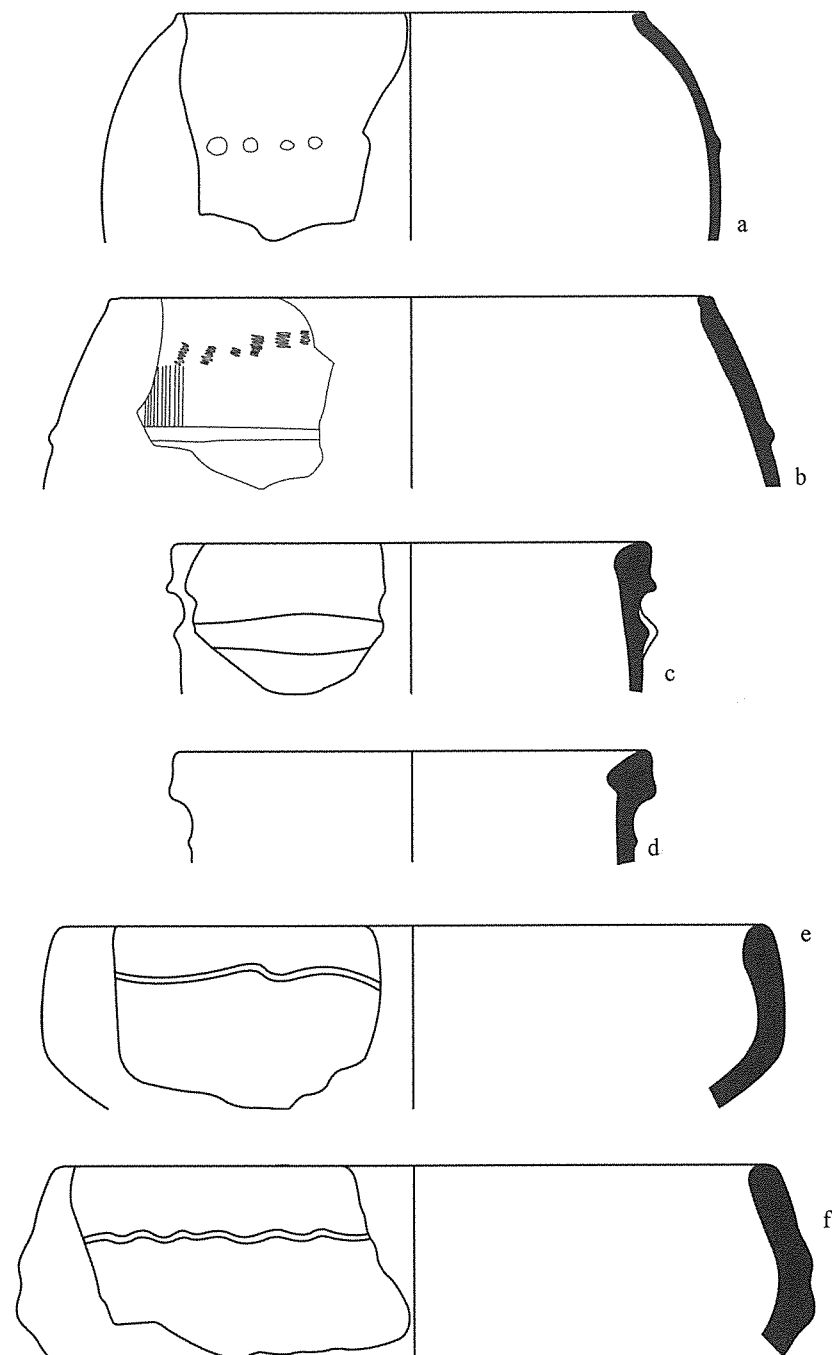


Figure 7.2 Illustrations of the ceramics mentioned in the text (author image).

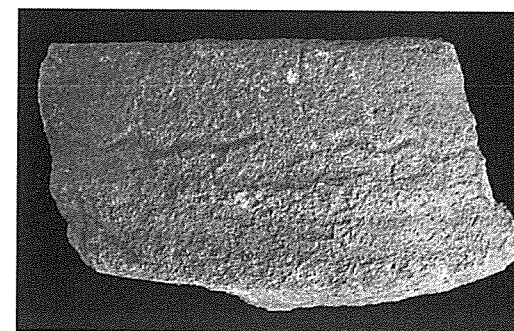


Figure 7.3 Photograph of an al-Lisi ware sherd (drawing 6) (author image).

indicate an association between them. Additionally, there is a group of twelve sites in the central part of the plain close to al-Lisi mountain where sherds with similar morphological and compositional attributes may indicate its further spatial distribution. However, there is some variation both in their shapes, which have more well-formed concave walls that flare out, and in their fabrics and surfaces, which are of different colors and proportions of inclusions.

Conclusion

The combination of both textual and material evidence for ceramic production, exchange, and consumption in the Dhamar Plain presents a composite picture of its rural economy. On the one hand, the limited amount of foreign ceramics in the survey collection demonstrates the relative economic isolation of this local population in the central highlands in contrast to the more outward-looking communities on the coasts. On the other hand, the distinct tradition of locally produced wares found in the Dhamar Plain, extending back millennia, points to the persistent economic independence of the rural population. Moreover, the variety of the regional assemblage suggests multiple levels of specialization by the local potters. This includes the production of the highly standardized wares described in the *Nur al-má'arif*. While their precise locales of manufacture remain unknown, pottery produced during the medieval period may be interpreted as taking place in a rural context. This well-developed local industry therefore provides a unique perspective on the rural self-sufficiency of an inland region of South Arabia.

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CHAPTER 8

Harnessing Hydraulic Power in Ottoman Syria

Water Mills and the Rural Economy of the Upper Orontes Valley

Stephen McPhillips

Water Mills and the Islamic Rural World

Hydraulic networks represent one of the principal signatures of human intervention in archaeological landscapes of western Asia. Both urban water supplies and rural irrigation networks feature prominently, the latter sustaining agricultural production in areas with insufficient annual rainfall for dry farming, or permitting intensive crop growing or horticultural production in areas such as the *zur*, the valley floor gardens of western Syria.¹ Hydraulic energy was harnessed using vertical-wheeled water mills from the third century BCE in the eastern Mediterranean, greatly augmenting the capacity for processing grain and other crops grown in the region.² Water mills became increasingly common during the first millennium CE, linked to the expansion of irrigation systems initiated by Late Antique and Early Islamic states in (the Levant), Iraq, and Iran.³ Few mills survive from the subsequent Abbasid to Saljuq periods (c. 750–1150 CE),⁴ but an extraordinary number are known from the medieval and especially the early modern eras, representing a rich source of data for understanding the economy of the rural Islamic world.

This chapter draws on fieldwork in the Homs region of Syria in October 2010,⁵ which examined eleven water mills and their associated hydraulic infrastructure in the Orontes valley. Two of the mills were documented in detail in the context of their immediate surrounds: Mill 2 (*Ṭābunāt Umm al-Raghif*) and Mill 4 (*Ṭābunāt al-Banjakiyya*) (Fig. 8.1). Stratigraphic architectural analysis suggests the earliest

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EDITED BY

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and Paul D. Wordsworth*

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