Chapter VI: Function and Use

CHAPTER VI: FUNCTION AND USE OF THE MIDDLE ASSYRIAN CERAMICS

“Let a written order go out from you to your brewer in Šahratu, that he must give beer and tarḫu-vessels (for) when the Suteans come to have dinner with me.”

Mudammeq-Asšur writing to Mannu-ki-Adad at Sabi Abyad.

VI.1 Introduction

Vessels are made for a certain purpose or, in the words of D.P. Braun (1983), pots are tools. This rather mundane but important realization immediately clarifies the importance of discussing vessel function and use in relation to the context of production and production organization. Vessel function and use is an integral and indispensable part of a study of pottery production, because it is one of the most important things the potter had in mind from the start of his work. However, after the vessels had been made and distributed, they could acquire a wide range of different uses and reuses over the course of time, not always closely related to their intended function and ultimately resulting in discard and deposition. In this chapter I will look into the different sources that can yield information, however fragmentary, on the function and use of the Middle Assyrian vessels.

One caveat has to be made at the beginning of this chapter: pottery vessels form only a part of all containers and vessels that were in use in the Middle Assyrian settlement. There are some indications that bronze vessels were used at the site (cf. M97-50, fig. VI.1), but most bronze and other metal vessels would have been taken away when the inhabitants left the site. Other containers made of organic materials, like wooden boxes, chests and bowls, baskets of different shapes and sizes, and textile and leather bags, were in use at the site but are barely preserved in the archaeological record. So we are dealing only with a partial set of containers used for the different activities at the site. Through the pottery we are studying only a small segment of the material and cultural context. This is important not only for our understanding of pottery as containers, but also for our understanding of pottery as a cultural phenomenon vis-à-vis other cultural expressions (such as architecture, other crafts, style and art; Ionas 2000: 113).


First, the archaeological context can provide clues to the way a vessel was last used. In some cases the relation between archaeological context and use is unequivocal, as when ceramics are part of a burial context. In other cases a real danger for circular reasoning exists: the identification of the use of space often proceeds exactly on the basis of the artefacts found there, including ceramics. Because a spatial analysis of Sabi Abyad is not part of this study, the possible role of the archaeological context in establishing or inferring the use of ceramics is even more limited. The archaeological context will therefore only be mentioned in very clear or remarkable cases, as far as it was noted in the pottery documentation. This section will also discuss any remains of contents like charred seeds, crusts or other residues, which provide a second source of direct evidence for vessel use.

A second perspective is the study of the performance characteristics of vessels, and the study of the use traces left on the vessel surface. Traces of use, studied for the first time in a systematic way by Skibo

170 In this respect, it is interesting to see that a text about Hurrian deportees and their properties (Freydank 1980) lists metal cooking pots but no pottery vessels among the household goods.
171 That these containers were in use at the site is proved by the impressions they have left on the reverse side of clay sealings (Duistermaat and Wiggermann in prep.). Another indication is provided by basketry impressions on bitumen, found in level 6.
(1992), include sooting, abrasion, and scratches. Performance characteristics include all aspects of a vessel that have an influence on its performance as a container or tool. They include fabric and inclusions, firing, porosity, thermal-shock resistance, the general shape and presence of appendages like spouts, handles, holes, etc., surface treatments, decorations, and size, as well as the related aspects of capacity, accessibility, stability, and transportability (Rice 1987: 207-243, Tite 1999, Skibo 1992: 36-38). Combining all information, these aspects can provide indications as to the function of the vessel. Usually, the different performance characteristics are summarized in a functional classification, listing vessels for processing, serving/eating, transport or storage (cf. Pfälzner 1995: 23, Rice 1987: 209, 238, see also Ionas 2000: 30-37). A similar classification of the vessels from Sabi Abyad will be presented in this chapter, summarizing all available evidence.

The third approach used in this study is the Assyrian textual and art-historical context of the pottery. Ancient vessel names, the occurrence of vessels in texts of different natures (lists, letters, literary texts) and dealing with different subjects, and indications for the capacity or content of vessels from texts all help to reconstruct the functions and uses of ceramic vessels. Furthermore, the way ceramic vessels are depicted in iconography can be informative. Contemporary textual information about prevalent foodstuffs and diets, recipes and ways of preparing food form a background to this part of the chapter. Unfortunately, the information from iconography and cuneiform texts about pottery vessels and their use is extremely limited in the Middle Assyrian period.

Of course, there are other ways to study function and use as well, but they could not be pursued here. This study does not include the laboratory analysis of residues of foodstuffs or other materials left in or on the vessel walls (e.g. Gouin 1996, Deal and Silk 1988, Rice 1987: 233-234). A laboratory materials science approach, studying aspects of porosity, mechanical stress, and so on has only been carried out for two cooking-pot sherds (cf. Appendix D). Experimental studies of the ways in which vessels can be used (Rice 1987: 211, Schiffer 1990) are not dealt with in this thesis either.

This chapter will deal with the ceramics from the Middle Assyrian levels 6 to 3 only. For reasons of readability, all data pertaining to function and use have been collected in Appendix G, discussing the archaeological context, the performance characteristics and traces of use, for a number of vessel groups separately. These include the most popular Middle Assyrian shapes (the “top ten” in each level, cf. Chapter IV). Because detailed rim variations are thought to be generally of less influence on function and use than the overall vessel shape and vessel properties, various type numbers will be grouped in this discussion. Several unique shapes will be discussed in the text of this chapter. For each shape group, Appendix G lists all the data on functional aspects discussed in this paragraph. The sixteen groups thus formed comprise almost 90% of all rims and complete vessels found at the site, and are:

- Carinated bowls (types 111, 112)
- Carinated bowls with long vessel wall above the carination (type 113)
- Small and large straight-sided bowls (types 131, 132, 143)
- Deep bowls and open pots (types 141, 142, 221, 222)
- Closed cooking pots (types 211, 212, made from cooking wares)
- Closed pots (no cooking pots, type 211a, 212a)
- Small jars (types 311)
- Medium-sized and large jars (types 312, 321, 322, 323)
- Jars with a handle (type 333)
- Goblets (types 411, 421)
- Pot stands (type 611)
- “Pilgrim flasks” (type 911)
- Strainers (type 511)
- Bowls with handles and a spout (type 151)
- Large pots (types 212b, 215, 221b, 145)
- “Grain measures” (type 225)

A distinction will be made between the function and the use of a vessel. “Function” indicates the broad vessel purpose that the potter had in mind when producing a certain vessel. Function is therefore most
closely related to vessel design. Multiple functions may have been part of the design of a single vessel type, whereas different vessel types may have had similar functions. The word “use” indicates in which way vessels were ultimately used. In this case we are dealing mostly with the way the vessel became part of the archaeological record. Use can also leave traces on the vessel during its use-life. Often function and use will be similar, but generally the uses of vessels may be both more varied and more specific than their function (cf. Rice 1987: 233, Rice 1990:1-2, Skibo 1992: 35, Henrickson 1990: 83-84).

VI.2 Ceramics in their archaeological context

Remarkable find contexts

Apart from the numerous small sherds found in all archaeological debris and discard contexts at Sabi Abyad, many complete or reconstructable vessels were found in floor contexts at the site. About 10% (representing almost 2000 vessels) of all database entries were vessels with at least the rim and the base preserved. At first glance all common vessel types were found in all areas at the site. Awaiting a complete functional analysis to see if differences do exist, not many areas can be singled out as “different” based on the pottery finds. Apart from the pottery workshops (discussed in Chapter V) which obviously contained a different set of ceramics than other contexts, some exceptions may be mentioned here.

The first is a room in square K9 in level 5, containing several small ovens (fig. VI.2). In one of these ovens the broken but reconstructable imported cooking pot P93-308 was found. The room stands out because of the rest of the pottery finds as well since many of the special (imported) shapes were found here, including the bowls with a spout and handles (type 151), “pilgrim flasks” (type 911), and dark bowls with white-filled impressed decorations (type 113). It is clear that we are not dealing with a house or living area like the rest of the areas at the site. The space was tentatively identified as a kitchen for the dunnu staff (Akkermans and Wiggermann in press).

Another special area that can be mentioned here is a small room south of the “office” area of abarakku Tammitte in level 5 (fig. VI.3). This room was completely filled with many very large storage vessels, part of them dug into the floor. The room may well have been a storage room for bulk goods. Later the room was used as a dump for other large and small pottery vessels and garbage.

In several other locations large jars or their reused bases were found to be part of some kind of industrial installation made of mud bricks (fig. VI.4). The jars seemed to have the role of collecting liquid or other material, but the exact use of these installations is as yet unclear.

Several small and middle-sized bowls were found on the rim of large jars, acting as a lid. Other specific find circumstances, where applicable, are mentioned in Appendix G.

Remains of contents

No chemical analyses of organic residues in or on vessel walls were performed. Promising vessels for such a study would include cooking pots (identification of fats), “pilgrim flasks” and storage jars and pots (traces of wine, (perfumed) oil, beer, ghee, tanning materials), pots with a hole in the base and large storage pots (see Zarnkow et al. 2006 who have identified these vessels as used in beer production), and deep bowls with a spout and handles that must have had a specific, although unknown, function. Possible traces of residues were recorded in a small number of cases. These include stains or discolourations in various colours (orange, reddish, brown, greenish) on the inside of vessels (carinated and straight-sided bowls, large jars, a strainer); crusts of a carbonized material inside (carinated bowls); and whitish or yellowish crusts or accretions sticking to the inside (carinated bowls, closed pots, small and large jars, large storage pots). The exact nature of these stains and crusts must remain unclear for the time being.

Other remains of original contents include charred grains, seeds, sesame, garlic and possibly fruits. These were found mainly in carinated bowls, as well as in small and large jars, and in large storage pots. These botanical samples have not completely been analysed yet. However, they indicate that short and long-term storage of grain and other dry foodstuffs probably took place in these vessels. Due to their adhesive
qualities, dark-red pigment, gypsum/lime paste and bitumen paste were also found inside vessels (fig. VI.5), mainly in carinated or straight-sided bowls and in the broken base of a small jar. They show that these containers were (secondarily?) used for short-term storage and processing in craft production or repair of artefacts. The few artefacts found in vessels usually do not provide clear indications of the vessel use. In any case, they indicate that smaller vessels like deep bowls and small jars were not only used for the storage or processing of foodstuffs, but also for the storage of tools, raw materials (e.g. for stone cutting or bead production, fig. VI.6) or more precious objects.\textsuperscript{172}

\textbf{Ceramics in burials}

Ceramic vessels occurred in burials of adults and children in two ways: as a container of the body or cremation remains and as a burial gift. In either case ceramics would have had a practical as well as a symbolical role in the grave.

The Late Bronze Age burials from Sabi Abyad will be published in the forthcoming volume on the results of the excavation (Akkermans in prep.) and have been the topic of an unpublished Leiden University MA thesis (Otte 2005). This paragraph is solely based on preliminary information from the field documentation. Not all burials contained pottery or made use of pottery vessels as containers. This paragraph will only deal with those graves that did contain pottery.

Pottery jars were used to contain the remains of the deceased. Two kinds of burials made use of pottery jar containers: cremation graves\textsuperscript{173} (most probably adults) and burials of children (in one case two young children were buried in one jar).\textsuperscript{174} The jars used for cremation graves (cf. fig. VI.7) mostly date from levels 4 and 3, or could not be attributed to a level because the level from where they had been dug in had eroded out. Interestingly, cremations were put in jars with a neck of type 315 or 318 (fig. IV.78.d, IV.108.n, IV.118.h), and not in the more common jars of types 311 or 322. Most cremation jars were closed with a type 111 carinated bowl as a lid, whereas jar P98-57 (fig. IV.78.d) was originally closed with a piece of textile tied over the opening with rope and then sealed with a clay sealing. The sealing was still \textit{in situ} at the moment of excavation. Burial gifts in cremation graves included bones and skulls of sheep or goat and ceramic bowls in the burial pit, as well as beads, necklaces, bronze and gold bracelets, rings, earrings and other jewellery in the cremation jar, some of them also known from burials at other Middle Assyrian sites (cf. Ohnuma and Numoto 2001: pl. 49b). The cremation of a corpse was not customary in Assyria, and the relation with jars of a different type than the common Middle Assyrian type 322 jar may suggest that the persons were non-Assyrians as well.\textsuperscript{175} Perhaps the cremations were local non-Assyrian persons whose own cultural traditions were respected at the moment of their deaths.

It seems that babies and toddlers were usually buried in jars. The jars used for these burials are exclusively of type 323 and 322, the large ovoid Middle Assyrian jars (fig. VI.8). Usually the broader ones with a large circumference were chosen as opposed to the more slender shapes, so as to have more space inside. The rims and/or bases of the jar were sometimes missing or had been intentionally removed. The jars were mostly left open (although textile covers would not have been preserved), but sometimes a mud brick was placed at the open end as a kind of closure. Burial gifts in these jar graves included a ceramic bowl and personal jewellery like bronze anklets or bracelets, iron rings, and shell and stone beads. Graves of adults\textsuperscript{176} were sometimes covered with large sherds from huge storage vessels. The sherds then function as some kind of protection, and were used in the same manner as mud bricks placed over the body in other burials. However, not all Late Bronze Age adult burials were covered by bricks or sherds. There were no burials of adults where two large pots were placed with the rims against each other as a coffin, a popular custom in other periods in northern Syria (cf. for example Jean-Marie 1999 at Mari).

\begin{footnotes}
\footnote{The storage of cuneiform tablets in jars, as at Giricano Höyük (Radner 2004), has not been attested at Sabi Abyad.}
\footnote{Jars P93-133i and P93-133ii; P96-87 and P96-86; P98-57; P01-130 and P01-135; P01-56; P01-60.}
\footnote{Jars P93-334; P96-529; P96-460; K8 83-178; K8 96-203.}
\footnote{Of the three sherds from type 315 jars studied in thin section (Appendix D sample nos. 42, 47 and 37) one was most probably made from local clays found around Sabi Abyad, one was probably made from Balikh clays and one was definitely not of a local origin.}
\footnote{H9 44-87; BN 97-1 / H8 14-51; BN99-15 / H12 63-155; BN99-16 / H12 loc. 15; BN03-1 and BN03-9 / N12 loc. 32: burial inside pottery kiln L.}
\end{footnotes}
Both child inhumations and cremation burials use closed jar shapes to contain the body or ashes; no open shapes like deep bowls or pots were used for this purpose. The cremation jars were moreover carefully closed with lids, and once even sealed. The protective role of the pottery is quite clear in these cases. Although an in-depth discussion of Assyrian burial ritual and ideas about life, death and the nether-world would lead too far for this thesis, it seems plausible that the ceramics used as burial containers had some kind of symbolic aspect apart from their purely practical role of containing the remains of the dead. Mesopotamian textual sources, including literary and religious texts, abound with parallels between the making of pots and birth on the one hand, and between the breaking of pots and death on the other. Besides, the comparison between the human body and the pottery vessel seems to have been part of the Mesopotamian world of ideas (see for example Foster 1991).

As seen above, ceramics did not only serve as a container for a burial but were also part of the burial gifts. Interestingly, ceramic burial gifts are almost exclusively limited to small type 111 carinated bowls. Only once a small jar (type 312) was given as well. Pottery gifts occurred in all types of burials, whether they were cremation graves, children or adult inhumations. In the case of cremation graves the bowls were placed in the burial pit, together with parts of a sheep or goat (once together with another jar with a bowl as a lid; P93-134i and 134ii), while the personal jewellery was included with the ashes in the jar. In inhumation graves the bowls were nearly always placed near the head of the body, sometimes near the upper arms and seldom at the feet. Not all burials had pottery bowls among the burial gifts; sometimes only a few beads or rings were given, and other people were buried without any grave goods. The type of vessel as well as the place of the vessel near the head of the deceased indicates that these bowls were given into the grave in their function as food containers or drinking vessels. Perhaps actual food or drink was placed in the grave during a funerary meal. Or the deceased could have been given a bowl to use in the afterlife whenever a kispu meal would be offered to him or her by the family (cf. Sürenhagen 2002: 326).

Secondary use and discard

Some vessels were recycled even when broken (see Chapter V, also for illustrations). Several large jars were reused as pots in this way. After their top halves had been broken off, the fracture was straightened and smoothed and the base half could be reused as a pot. Once a rim and upper-vessel half of a large jar was reused, possibly as a pot stand.

After a pot had broken and was no longer useable as a container, its sherds could still fulfil different purposes (cf. Skibo 1992: 44). Several sherds were clearly reused as tools. Mostly, they seem to have been used as tools for scraping activities, as for example the loamer from the pottery workshop discussed in Chapter V (O03-120, fig. V.10). It was made of a body sherd. Rim and base sherds were also used as scrapers, as is shown by two carinated bowl rims (P97-208 and K8 102-214:7) and a base (fig. V.19). Sherds were also used for a make-shift pavement in streets, and to fill holes and weak points in walls. These sherds, as well as the ones from clear dump contexts, were often easily recognizable by their dirty, eroded surfaces and small size. In contrast, sherds from floor contexts were much cleaner and larger, and showed cleaner fractures. Not only sherds, but also more or less complete vessels were discarded, sometimes in abandoned rooms or in pottery kilns that were no longer used. Ultimately, whether discarded on purpose or not, none of the excavated vessels was deemed valuable enough to take along when the inhabitants left the site, and all eventually entered the archaeological record.

VI.3 Performance characteristics and traces of use

To be able to fulfil their functions, pottery vessels must be able to contain contents (whether dry or liquid) for a shorter or longer period of time, and they must not break too easily. When pottery vessels suit the

177 P93-102; P93-134i and P93-134ii; P96-177.
178 P96-494; P01-123 and P01-120.
179 P96-98 and P96-47; P96-174 and P96-451; P96-480; P97-204; P01-27; P01-119 and P01-120.
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Engineering requirements of the particular function and use, they are successful containers (Braun 1983: 108-109). The construction of suitable pots involves many choices of materials, techniques, shapes, and so on, and the end product will be a compromise between the demands of users and the environmental, economic, technological, traditional, cultural or ideological factors faced by the potter (Braun 1983: 109, Rice 1996a: 140). From the perspective of performance characteristics, the reconstruction of vessel function is based on several basic, function-related attributes (Braun 1983, Henrickson and McDonald 1983, Rice 1987: 207-243, 1990, Smith 1988, Henrickson 1990, Skibo 1992: 37, Schaub 1996, Lesure 1998, Tite 1999). At Sabi Abyad most of these data were collected systematically for all sherds and vessels during description in the field. These include measurements (rim diameter, base diameter, thickness, vessel height), fabric and inclusions, surface treatment, decoration, special features (the presence of burning traces, gypsum/lime crusts, bitumen crusts, base cracks or other deformations), vessel shape, and any remarks on damages, abrasions or repairs. Attributes that were calculated afterwards, on the basis of the field data or with the help of digitized drawings, are the maximum vessel diameter (in closed shapes), the ratio between vessel height and rim diameter, the ratio between vessel height and maximum vessel diameter, and the capacity in litres (see Chapter II for an explanation of calculation methods). A combination of these data was used to draw conclusions on three important aspects of vessels in relation to their function: the accessibility of contents, the transportability of the vessel, and the stability of the vessel. Detailed information on these data for the various shape groups can be found in Appendix G; here, a summary discussion will be presented.

Fabric and inclusions

The first choice the potter makes in the production sequence, that of the raw materials, has consequences for several material properties (Schiffer 2003) of the pottery. Aspects influenced by this choice include porosity and permeability, fracture strength, hardness, and ability to resist thermal shock. It is not assumed here that the potter was a materials scientist and completely understood or controlled the effects of different kinds and qualities of temper and raw materials. Neither must we assume that raw materials were always and only chosen because of their functional properties in a direct and causal way. For example, when laboratory tests show that a certain temper influences the porosity of the vessel, that does not immediately mean that the potter chose to add this kind of temper with the aim of creating a more porous vessel. Other reasons, like the workability of the clay related to the shaping technique, may be involved as well. Recently the realization that technological choices are embedded not only in a technical context but also in the environmental, economic, social, political and ideological contexts of society is becoming more and more accepted (e.g. Tite et al. 2001: 317, Sillar 2003). However, the potter and the pottery users would have been aware of the effects of different materials through experience. That these effects and qualities are often recognized by potters and users is also clear from ethnoarchaeological studies (e.g. Ionas 2000, Tite et al. 2001: 320-321, Braun 1983: 112, Arnold 2000: 342). Indeed, the existence of a relation between raw materials and functional suitability of a vessel is generally accepted in the archaeological literature, especially for cooking pots and water-storage vessels (Schiffer 1990). Experimental tests have been carried out both for archaeological and ethnographic pottery (e.g. Tite et al. 2001, Tite 1999, Schiffer 1990, Rice 1987: 226-232, 347-370).

It is therefore useful to see what the functional consequences could be of the choices of raw material made by the Sabi Abyad potters. In Sabi Abyad four major groups of fabric and inclusions can be discussed in the light of their functional properties: calcareous clay with added organic inclusions, calcareous clay without added inclusions, fabrics with sand inclusions, and the so-called “cooking wares”. As was shown in Chapter V, the locally available resources did not provide the potter with much choice. The whole region is characterized by marly clays. The only way the potter could vary his raw materials with the purpose of influencing the performance characteristics of the vessels was by varying the preparation of the clay body (e.g. by sieving or levigation, the addition of temper or the addition of salt). Or vessels with specific characteristics related to raw materials not locally available could be imported from other regions.

The greater majority of the pottery at Sabi Abyad was made of a local, marly clay with fine organic inclusions. This ware was used for almost all shapes and sizes of pottery. The addition of organic inclusions will make a fabric more porous, an attribute that is often preferred for short-term water storage vessels (Schneider 2006: 313, Schiffer 1990, Rice 1987: 231). The evaporation of the water through the vessel wall
will cool the water stored inside. This aspect may have been important for small and large jars, deep bowls and large storage vessels. However, one of the large pots with the cuneiform inscription “water” on the upper shoulder (Appendix F, and figs. F.6 and F.7) is coated on the inside with bitumen, preventing any evaporation through the wall. Besides, organic inclusions make a fabric lighter, a property that is useful when making very large vessels like the large jars and the large storage pots. Finally, the inclusion of fibrous material will make the fabric stronger, since small cracks are stopped at the void created by the inclusion (Tite et al. 2001: 313, Tite 1999: 219-220). Since all sizes, from small bowls with thin walls to huge storage pots with very thick walls, are made from the same clay with similar quantities of organic inclusions, one may wonder whether these functional considerations actually formed the basis of the potter’s decision to add organic material to the clay. From a technological perspective, as shown in Appendix D and Chapter V, the addition of organic inclusions and especially animal dung provides a much-needed improvement of plasticity and coherence in the very short marly clays. Because there is no relation between fabric and size or shape, I suggest that the increased workability of the clay, and perhaps the increased strength of the fired fabric, were the main reasons for the potter to include organic materials in his clays. The beneficial effects of increased porosity in jars and reduced weight in large vessels may have been a pleasant side-effect.

The only case in which the normal local clay was prepared in a different way is the use of a fine clay without organic inclusions for some small bowls and especially for the V-shaped and S-shaped goblets. The clay without organic inclusions would have been more difficult to work on the wheel, since the clay is less plastic and will tear more easily. Indeed, small tension cracks are sometimes visible on the inside vessel wall, due to the shortness of the clay. Because the potter only made small vessels in this ware, these shaping problems may have been minor. Nevertheless, the absence of organic inclusions was chosen deliberately and is perhaps related to the intended function. The organic inclusions in other shapes are generally rather fine. However, compared to the wall thickness of the goblets, they are much too coarse. Inclusion of organic material in these shapes would have created relatively large pores and perhaps even holes in the vessel wall. But even a finer material would have increased porosity. Instead, it seems that the potter’s aim was to create a very dense, fine-grained and non-porous fabric, even if this reduced the vessel’s toughness (Kilikoglou et al. 1998). Apart from creating a non-porous fabric highly suitable for holding liquids, one of the aims may have been to produce a fine fabric that resembled metal, faience or glass luxury goblets. The technical skill required to produce pottery goblets may have added to the feeling of luxury. It may be suggested that the choice for a fine fabric is related to the function of these vessels as drinking vessels in a social context.

Among the few vessels with a remarkable amount of sand inclusions, the so-called “pilgrim flasks” can be singled out. Archaeometric research has shown that most of these bottles were made of raw materials not available around Sabi Abyad or in the Balikh region; for one vessel, an origin much further away must be suggested (see Appendix D). Although these vessels are therefore not a part of the production system at Sabi Abyad (cf. also Chapter V), we may briefly discuss the performance characteristics related to the choice of sand as a temper. As discussed by Kilikoglou et al. (1998) for Punic transport amphorae, the addition of around 20% of quartz sand greatly increases the toughness of the vessel, and therefore the resistance of the vessel against mechanical shock (see also Tite 1999: 219). This is especially important since the amphorae, like the pilgrim flasks, had relatively thin walls to reduce the total vessel weight, a prerequisite in transport vessels (Rice 1987: 240). The choice for sand instead of organic inclusions as a temper material may additionally be related to the fact that sand temper results in a less porous fabric than organic tempers, which may have been important when liquids were transported. However, since we don’t know how the pilgrim flasks relate to the rest of the production tradition in which they were made, conclusions about the reasons for choosing sand as a temper must remain tentative.

The best studied relation between fabric, inclusions and performance characteristics is that in cooking pots. Because cooking pots had to resist thermal stress and thermal shock during use, and because they had to possess a certain effectiveness in heating the contents of the pot, it is assumed that potters tried to optimize the performance characteristics in various ways. The choice of the raw materials is one of these ways (the choice of wall thickness, vessel shape and surface treatment in cooking pots will be discussed below). Several laboratory experiments and ethnoarchaeological studies have been aimed at establishing the behaviour of different types of clay and inclusions in cooking pots (Rice 1987: 228-230). It has been suggested that shell and crushed calcite inclusions are superior in resisting thermal shock in cooking pots, because these materials have thermal expansion coefficients that are similar to that of clay. Therefore they
will not create internal tensions in the vessel wall during heating and cooling. Moreover, their platey shape would be useful in stopping small cracks and preventing vessel breakage (Rice 1987: 229, Vilders 1991/2: 69, Feathers 2003). Pottery with calcite inclusions cannot be fired at temperatures over 700°C (or a bit higher in a reducing atmosphere), because of the decomposition and subsequent re-hydration of calcite, which will damage the vessel (Daszkiewicz et al. 2006, Rice 1987: 97-98). Therefore these cooking pots are characterized by a low-fired fabric in dark colours. However, both (pre-)historic and modern cooking pots worldwide are tempered with a variety of coarse inclusions, including organic material, coarse sand, crushed basalt, and crushed talc. Some of these materials have even better thermal-shock resistance properties than calcite (Tite et al. 2001, Daszkiewicz et al. 2006). Many of them are fired at low temperatures, although there is no risk of breaking caused by calcite. At Sabi Abyad vessels were tentatively identified as cooking pots based on the unusually coarse mineral inclusions, thin vessel walls, rounded vessel shapes and often burnished surfaces (see below). The archaeometric study (Appendix D) shows that cooking vessels at Sabi Abyad were made of a variety of pastes, including different non-mineral inclusions. This reflects a multitude of origins in the Balikh Valley and further away. From a technological point of view the cooking pots do not fit the Sabi Abyad corpus, supporting a non-local origin. Tests of water permeability and thermal-shock resistance on two cooking pot sherds from Sabi Abyad revealed that the pot with talc temper (P03-308) had excellent properties for use over a fire. During the tests it stayed impermeable and undamaged. This pot was imported from the Ugarit region (see Appendix D, sample J728). Another sample (sample J730, Appendix D), made from a calcareous clay with coarse sand and crushed calcite inclusions, and therefore a “classical” example of a cooking pot, performed very badly. The fabric was full of small cracks that became worse after the thermal-shock tests (Daszkiewicz et al. 2000, the cracks are visible in fig. D.54). However, it can be remarked that these tests were performed on vessels that were thrown away after use, and that only the residual properties after use and deposition are tested (cf. Braun 1983: 114). Perhaps the vessel had been used so often over a fire that it became porous and was deemed useless as a cooking pot, which was subsequently confirmed in the tests. Other cooking pots from Sabi Abyad have coarse calcite, organic, crushed-shell, crushed-basalt and coarse-sand inclusions, and were made both from calcareous and non-calcareous clays. All of them were fired at low temperatures. Indeed, laboratory tests suggest that the most important characteristic of a fabric suitable for making cooking pots is that it has a high temper concentration (of any kind) and a low firing temperature (Tite et al. 2001: 321, LeMière and Picon 1994). Cooking pots with different kinds of inclusions seem to perform equally well, but pots made from non-calcareous clays seem to be better (Daszkiewicz et al. 2006: 426; 2000).

Summarizing, we have seen that the fabric and inclusions of a vessel type may be related to its intended function. In the case of Sabi Abyad this seems to be especially true for imported pottery, while the pottery produced at the site was largely made of one ware without any indication of functional differences. Possibly the imported vessels were coveted especially because of their superior performance characteristics, related to the raw materials used as well as to shaping techniques.

Vessel design

Most studies of ceramic function focus on the design and shape of the vessels. Extensive comparative research in ethnographic situations has shown that there are several basic relations between general vessel form and general functional category (Henrickson 1990, Henrickson and McDonald 1983). Although a specific function cannot be inferred from general vessel shape alone, and vessels with similar design may be used for different purposes, the broader functional categories of storage, processing, and transfer (Rice 1987: 208) may be very useful for further spatial and functional analysis of a settlement. The most important aspects of shape in this context are vessel size (rim diameter, maximum vessel diameter and vessel height), openness or restrictiveness (accessibility of contents), stability, capacity and transportability (Schaub 1996: 234, Smith 1988: 914, Rice 1987: 224-226). This paragraph will also discuss more specific function-related attributes in ceramic vessels, like base holes, handles and spouts, and surface treatment. Several special shapes and their possible function will be discussed as well.
Shaping methods
The shaping methods used by the potter seem to have only a limited effect on the suitability of the vessel for the intended function. In Chapter V and Appendix G it is shown that vessels thrown from the cone without further treatment of the base may show serious base cracking (especially in carinated bowls and straight-sided bowls). These cracks often prevent the vessels from being used as containers for liquids. Often the potters attempted to repair the cracks. The potters explicitly avoided or carefully repaired cracks in bases or walls of deep bowls, small jars and large jars. Base cracks never occur in cooking pots, closed pots, “grain measures” and “pilgrim flasks”. Possibly these vessels were meant to be used for liquids, so that the potters put extra efforts in producing a vessel without flaws.

Relating vessel shape to function
Although the vessel shape is not the only clue archaeologists may use to reconstruct vessel function, it is the one used most. Both intuitively and through ethnographic observations, archaeologists feel that there is a rather strong relation between the two (Jamieson 2000: 275-276 with bibliography, Rice 1987: 211). The relations between general vessel shape and general function have been studied both in archaeology and in anthropology, and seem indeed to be rather stable between cultures and periods (Lesure 1998: 20, Henrickson and McDonald 1983: 631-634, Rice 1987: Table 7.2).180 They can be listed as follows:

Cooking pots
- Short, squat shape
- Rounded vessel shape without sharp angles
- Large base surface, often rounded base
- Somewhat restricted shape
- Lugs and handles are optional

Serving and eating vessels
- Low, open shapes (bowls), stable
- Often decorated
- Short life-span (resulting in relatively large amounts in the archaeological record)
- Individual and family capacities (often with the ratio 1:3)

Dry storage
- Opening often allows scooping out the contents
- Few lids
- Rims rolled over for fastening a flexible cover
- Temporary storage: shorter and more stable vessel shape
- Long-term storage: taller and thinner vessel shape
- Appendages and handles only on long-term storage vessels, for a better grip

Liquid storage
- Long-term storage: large, immobile when full
- Taller and thinner shapes than dry-storage vessels
- Temporary storage: smaller sizes
- Everted rims to aid in pouring
- Openings restricted to prevent spilling, but often openings do allow dipping or scooping
- Relatively more often burnished or glazed

Liquid transport
- Globular vessel shape
- Small orifice

180 M. Smith (1988) tried to express the relation between shape and function in a mathematical formula, based on data from ethnographic and archaeological cases. Application of her formulas did not yield any interesting results for the pottery from Sabi Abyad: all vessels and types ended up in her broad class of “utility”.

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Chapter VI: Function and Use

- Handles, especially when meant for short-distance transportation
- When full portable by a single person

In Appendix G each of these aspects is listed with the individual vessel groups. Moreover, Appendix G lists information on the size of the vessel and the ratio between vessel height and maximum vessel diameter. These are often taken as good indications for vessel function. The capacity of the vessels was calculated, and the values are listed in Appendix G. The other aspects of vessel shape are not expressed in a numerical form, but rather as belonging to a category (low, medium, high, etc.).

The accessibility of the vessel contents is basically a function of vessel shape: open shapes are easily accessible, while closed shapes both restrict the access to the vessel and prevent the contents from spilling out easily. However, accessibility is more than just a restricted or unrestricted shape. For example, the contents of closed pots are still rather easily accessible because of their large rim diameters. Small jars, in contrast, have rim diameters that are generally small; their orifices do not allow a hand or a scoop to get at the contents. Similarly, although large storage pots have rather large rim diameters, they are very deep and contents may be difficult to scoop out from the bottom. For some vessels, like the large jars or the pilgrim flasks, pouring may be the only way to get the contents out.

Stability relates to how easy a vessel can stand on its own without a support and how easily it is tipped over. This is related to the overall vessel size, the width of the base and the centre of gravity of a vessel. Tall vessels with small bases are less stable than low squat vessels with broad bases. However, the use of a stand may greatly increase vessel stability, and is especially helpful in case both stability and unstability have a function. For example, the large jars need a high centre of gravity for pouring, and are most probably made unstable (tall and with a small base) on purpose. Stands were then provided for the necessary stability when the vessel was not handled (fig. VI.9). The high stability of deep bowls, closed pots and large storage pots suggests that they were meant to be mainly stationary. In contrast, goblets could never stand on their own, and this is perhaps related to the customary position during drinking, holding the vessel in the hand when full. Interestingly, the small jars (type 311) are unstable as well, and over time (especially in levels 4 and 3) the bases become more narrow (cf. Chapter IV). They could hardly stand alone, but small ceramic stands have not been found. Perhaps these jars were drinking jars (their capacity and general shape is well suited for this purpose), possibly for beer. Perhaps they were set in wooden racks, as is depicted in Neo-Assyrian art (fig. VI.40, 41).

Transportability is related both to the shape of the vessel (do the contents easily spill, do handles and ridges facilitate handling?) and to the size and weight of a full vessel. Depending on the capacity and wall thickness, vessels easily become too heavy to carry over a larger distance, even if carried by several persons. The ease with which a vessel can be held is a factor as well. For each shape group, the vessels were thus assigned to one of the general functional categories listed above.

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181 Large jars can also be set leaning against a wall or against other vessels. Especially if more jars are set against each other, this method provides a rather stable position.
Table VI.1: The functional aspects of vessel shape listed for each vessel type.

* Ratio is the ratio between the vessel height and the maximum vessel diameter.

<table>
<thead>
<tr>
<th>Vessel type</th>
<th>Ratio*</th>
<th>Size</th>
<th>Accessibility</th>
<th>Stability</th>
<th>Capacity</th>
<th>Transportability Long distance</th>
<th>Transportability Short distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carinated bowls</td>
<td>0.37</td>
<td>Small</td>
<td>Very easy</td>
<td>Medium – high</td>
<td>Small</td>
<td>Very bad</td>
<td>Good</td>
</tr>
<tr>
<td>Goblets</td>
<td>1.16</td>
<td>Small</td>
<td>Easy</td>
<td>Low</td>
<td>Small</td>
<td>Very bad</td>
<td>Good</td>
</tr>
<tr>
<td>Straight-sided bowls</td>
<td>0.34</td>
<td>Small - medium</td>
<td>Very easy</td>
<td>Medium – high</td>
<td>Small-medium</td>
<td>Very bad</td>
<td>Good</td>
</tr>
<tr>
<td>Deep bowls</td>
<td>0.85</td>
<td>Medium</td>
<td>Easy</td>
<td>High</td>
<td>Medium</td>
<td>Bad</td>
<td>Medium</td>
</tr>
<tr>
<td>Cooking pots</td>
<td>-</td>
<td>Medium – large</td>
<td>Medium</td>
<td>Low</td>
<td>Medium – large</td>
<td>Bad</td>
<td>Medium</td>
</tr>
<tr>
<td>Closed pots</td>
<td>0.87</td>
<td>Medium</td>
<td>Medium</td>
<td>High</td>
<td>Medium</td>
<td>Bad</td>
<td>Medium</td>
</tr>
<tr>
<td>Small jars</td>
<td>1.43-1.6</td>
<td>Small-medium</td>
<td>Difficult</td>
<td>Medium</td>
<td>Small – medium</td>
<td>Medium – good</td>
<td>Good</td>
</tr>
<tr>
<td>Large jars</td>
<td>1.88-2.1</td>
<td>Large</td>
<td>Medium – difficult</td>
<td>Low</td>
<td>With stand: high</td>
<td>Large</td>
<td>Difficult</td>
</tr>
<tr>
<td>Large storage pots</td>
<td>1.19</td>
<td>Very large</td>
<td>Medium – difficult</td>
<td>High</td>
<td>Very large</td>
<td>Impossible</td>
<td>Impossible</td>
</tr>
<tr>
<td>Pilgrim flasks</td>
<td>-</td>
<td>Medium</td>
<td>Very difficult</td>
<td>Low</td>
<td>Medium</td>
<td>Good</td>
<td>Good</td>
</tr>
</tbody>
</table>

Surface treatment
Very few vessels at Sabi Abyad show a surface treatment other than simple smoothing. When surfaces are treated, they are mostly burnished. Burnishing is usually done for a variety of reasons, including display (a shiny burnished surface is attractive) and reduction of permeability (a burnished surface does not let liquids through easily). Burnishing for aesthetical reasons may have been applied in the case of the carinated bowls with a long vessel wall above the carination (type 113). These bowls are also frequently decorated (fig. VI.10). Burnishing for improving vessel performance was probably applied in the case of the cooking pots. It was shown (Schiffer 1990) that exterior burnishing increases the heating effectiveness of cooking pots. Indeed, several of the Sabi Abyad cooking pots show burnished surfaces. Many of the so-called “pilgrim flasks” were burnished as well, and this was perhaps done to reduce permeability of the vessel wall, suggesting that these vessels were used for the long-term storage or transportation of liquids. Why the deep bowls with handles and a spout (type 151) were burnished remains unclear. Some very large vessels were coated with bitumen on the inside, perhaps in an attempt to make the vessel watertight.

Special features
Some shapes were made with features that may provide us with a clue to their function. Some small carinated bowls had holes made in their bases before firing. Clearly, these bowls were not meant to hold liquids. Perhaps the holes functioned as a ventilation when the bowls were used as lids. Or the bowls were meant to perform as a kind of small strainer. Very large open pots frequently have base holes as well. These may have functioned similarly, as ventilation holes when storing dry goods in them. Or these vessels may have been used for the soaking of grain in beer production (see below). A special shape is represented by a deep bowl with a base hole and a strainer attached to the inside over the hole.

Handles facilitate the lifting and tilting of vessels and are especially often used in vessels for liquids. They were found on closed pots, deep bowls with spouts (type 151), on some jars and on “pilgrim flasks”. An exceptional shape is a U-shaped drinking mug with a big handle (P97-195, fig. IV.91.ag). Spouts are obviously connected to the pouring of liquids as well. They often occur together with handles. Shapes with handles and spouts are therefore suited for the serving and processing of liquids (fig. VI.13 and VI.14).

Capacity
Capacity measures in the Middle Assyrian period are not without problems. Different absolute sizes as well as different amounts of smaller units per larger unit seem to have been used. In texts from other sites, there
are “old”, “new”, “big”, “little”, “palace” and “ḫū ḫburnī” measures, and their precise meaning is often unclear (Powell 1987/90: 501). At Tell Sabi Abyad the following ratios between capacity measures were used (Wiggermann 2000: 186):

\[
\begin{align*}
1 \text{ imēru} &= 10 \text{ šūtu} \\
1 \text{ šūtu} &= 10 \text{ qū}, \text{ whereby the qū is taken to be 0.84 litre.}
\end{align*}
\]

These values have also been used in Appendix G, to give an indication of the capacity in Assyrian measures of a vessel group. A jar from the nearby Middle Assyrian site of Tell Chuera, comparable to our large jars (type 322), was inscribed after firing with the sign for 1 šūtu. The capacity of this jar was calculated from the drawing to be between 13.8 and 15.2 litres, equalling about 17 qū when 1 qū = 0.84 litre (I. Boesze, personal communication). Whether the inhabitants of Tell Chuera used a different value for their capacity measures (for example the “big” šūtu of approximately 16 litres, as opposed to the “old” šūtu of about 8 litres, cf. Powell 1987/90: 501) than the inhabitants of Sabi Abyad, must be revealed by further study; however, this example illustrates the flexibility and variability of the measurement systems in use. Other vessels with inscribed capacity measures come from Nimrud (NA; Oates and Oates 2001: 62, the inscription implies a qū of 0.792 litre), Tell al-Rimah (OB; Postgate 1978, with a qū between 0.82301 and 0.79073 litre) and Mari (OB; Joannès 1980, a qū of 0.799 litre). It is hoped that the capacity measures provided for the complete vessels from Sabi Abyad in Appendix G and in the individual descriptions in figs. IV.1-120 will provide those interested in capacity measures with additional material for their studies. Unfortunately, so far no capacity measures have been found inscribed on the Sabi Abyad vessels, so a direct comparison between vessel capacity and terminology is not yet possible.

As the capacity measurements listed for different shapes in Appendix G show, none of the vessel groups was made in a standardized or fixed capacity, even when size groups exist. The capacity measures generally vary widely around the mean value for the (size-) group. The coefficient of variation (CV; see Chapter II for an explanation of what this value means) is smallest (12%) for the type 911 “pilgrim flasks”, which seem to have been produced at a size of more or less 9 qū. Usually CV values for capacity are around 35% or even higher, suggesting that a standardized capacity was not aimed at in any of these cases.\(^{183}\) Generally, the variation in single size measurements, like rim diameter or vessel height, varies much less than the capacity. This is not surprising: it is much easier for a potter to measure vessel height or rim diameter, and even maximum vessel diameter, than to measure and shape a vessel with an exact capacity.\(^{184}\) Capacity can only be precisely measured in a dried vessel, but then the shape is already fixed and cannot be adjusted anymore. Therefore, although some shapes (carinated bowls, jars) were clearly produced in different size groups (small, middle, large), the exact capacity was probably not an issue. When the vessels at Sabi Abyad were mainly used in domestic contexts for preparation, storage and consumption of food and drink this is not remarkable. Exact volumes in vessels would only have been needed in case ceramic vessels were used as a measuring tool (for example in the distribution of rations), or in case the contents of the vessels were traded “per container” instead of per volume. In this context it is interesting that the imported “pilgrim flasks”, which were probably obtained for their contents, show a more standardized capacity.

It is clear from cuneiform texts that measuring vessels existed in the Middle Assyrian period, and could have been made of wood, metal or other materials, as well as of pottery (see below: šūtu, mišlu, šappatu). It is not known what these vessels looked like or whether they were recognizable as specialized measuring vessels. The only specialized vessel type in the Sabi Abyad repertoire that may have served as a...
measuring vessel is the so-called “grain measure” (type 225). The term “grain measure” was originally coined by M. Mallowan (1936, 1946) to indicate a cylindrical vessel that occurred in two sizes: short and tall (Gates 1988: 65). Probably on the basis of the formal similarity to modern measures for dry goods, Mallowan suggested that these vessels may have been used to measure grain for rations. However, he did not calculate the capacity for these vessels. M.-H. Gates recently concluded that they were probably not used as measures, since standards of measure were not of uniform size in each location (1988: 65 and note 3). Nevertheless, the use of ceramic measuring vessels has been attested in the texts. The capacity of completely preserved “grain measures” from the Middle Assyrian levels at Sabi Abyad could only be calculated (up to the rim) for two vessels, and these did not seem to suggest a uniform capacity (see Appendix G). A uniform volume was not expected in any case, because of the difficulties discussed above of producing a vessel with a set volume. However, most “grain measures” from levels 6 to 3 show horizontal incisions executed in a leather-hard state on the outside of the vessel. If the capacity of the vessel is calculated each time up to the next incision, a remarkable pattern appears. Allowing for inaccuracies in the original vessel drawings and in calculating the capacity from a pottery drawing, we see that each section of the vessel could hold a set fraction of the qû (fig. VI.17.12). For example, in vessel P96-413, the three lines are drawn at about 1/3 qû each. This vessel was used secondarily as a gypsum container in the level 5 pottery workshop in M11, and perhaps this system was no longer used at the time.185 The other five measured vessels and vessel fragments, indeed, show fractions of 1/2 qû in each part delimited by a horizontal incision. It is possible that the potter first made a cylindrical shape with a volume of more than 2 qû. Because he could not shape a vessel with an exact capacity of 2 qû, he first let the vessel dry until it had reached a leather-hard stage. Then, with the help of known quantities of dry goods (grain, for example), he could measure the line up to which the vessel contained 1, 1 1/2 and 2 qû, and mark these points with incised lines. After firing, the vessel could thus be used as a measuring vessel by filling up to one of the lines, although not with a very high accuracy. Indeed, several cuneiform texts from Sabi Abyad indicate that 1/2 qû was the smallest measuring unit in use.186 The Sabi Abyad sample is too small to conclude irrefutably that these vessels were indeed used as measuring vessels. However, these results do merit the further study of other “grain measures” found at other sites and in other periods. Very small ceramic measuring vessels, perhaps represented by the word kāsu (see below), could only be found among the very small carinated bowls. None of the pottery vessels found at Sabi Abyad is likely to have been used as a measuring vessel for the larger volume measures known from the texts, like the sūtu. Any completely preserved vessel that could hold a volume of approximately 1 sūtu is not recognizable as a measuring vessel when compared to vessels of the same shape, type and size-group, while the capacity of these similar vessels varies widely.

Traces of use

Apart from any remains of contents and the specific archaeological context, indirect information on vessel use can be deducted from the traces left by the activities in which the vessel was involved (Skibo 1992). Traces of use are on the whole rare on the Sabi Abyad ceramics. Alteration of the surface of ceramic vessels was studied only macroscopically at Sabi Abyad. Any remarkable attrition of the surface was noted in the remarks of the database, including the location of the attrition on the vessel and sometimes including suggestions as to the cause of these traces. General terms were used to describe these traces, like “abraded”, “eroded”, “damaged”, or “flaking surface”. Traces of burning or sooting in different locations on a vessel form another kind of use-related traces. Burning traces, or deposits of a light layer of soot on the surface of the vessel, were noted in almost all vessel groups in small percentages. At Sabi Abyad generally between 2 and 4% of all sherds show traces of burning. However, in most cases, these burning traces must be related to processes of deposition, for example when a building was destroyed in a fire or when garbage was burnt. This is especially so when

185 A division of the qû in thirds is not attested in the texts from Sabi Abyad, but is mentioned in the lexical lists cited in CAD qû B (F.A.M. Wiggermann, personal communication).
186 For example T93-11 dealing with oil, and T98:54 concerning grain for sowing. In the ration lists from Aššur 1/2 qû is similarly the smallest unit (MARV III 3) (F.A.M. Wiggermann, personal communication). Perhaps, the vessel names ḫupā’u (a (broken) vessel of ½ qû) and mišlu (a half-size container) may be connected to these vessels.
burning traces do not show a preferential location on the vessel, or when the burning traces extend over the fracture of the sherd. Only rarely were burning traces found that can be related to the use of the vessels. The clearest example is the group of cooking pots (types 211, 212). Almost 27% of all cooking pots showed traces of burning, mostly on the outside surface. Since most cooking-pot sherds are rims (loose body fragments were not kept), it is not clear whether sooting was more severe at the base of the pots. The use of these vessels in or over a fire is, however, clear. Another example in which burning traces may provide a clue as to the use of the vessel is in small carinated bowls. About 7% of all carinated bowls have burning traces, and more than half of them belong to the group of very small bowls. There burning traces tend to be located on the inside of the rim, mostly in one or two spots only. It looks as if something was burnt in one spot inside the bowl, and it may be suggested that most of these bowls were used as oil lamps, with a fibre wick sticking out at the rim. That bowls were indeed used as oil lamps is shown by P92-21, an oil lamp with a pinched rim (fig. VI.16). A small carinated bowl was stuck inside with gypsum/lime paste after the lamp had cracked.\(^{187}\) In large jars, too, about 7% contain traces of burning. Mostly these must be related to depositional processes. However, in several jars as well as in several large storage pots it was noted that burning traces were concentrated especially on the inside surface of the rim, not extending down the vessel. How these traces came about is not certain, but perhaps they are related to the use of flammable textile covers over the rim.

The abrasion of inside vessel surfaces may be related to the repeated use of hard tools in vessels, for example in pounding, crushing and grinding, mixing, or stirring. The surface is damaged, but the remaining surface and vessel or fragment retain their internal cohesion and strength. This kind of damage was noted for carinated bowls (mainly middle and large size), in about 10% of all straight-sided bowls, in several large deep bowls, several cooking pots, one closed pot, in one small jar (clear traces of scraping), a deep large pot, and in deep bowls with a spout and handles. Probably these vessels were used in the processing of food or other materials. Abrasion of outer vessel surfaces, most often at the base and lower vessel wall, is probably related to the movement of the vessel over a rough surface (the floor, a pot stand, a hearth). This type of attrition was noted in type 113 carinated bowls and on the base of the large cooking pot P93-308.

Flaking is different from abrasion in that the surface of the sherd was still crumbly at excavation and description, and new small flat fragments kept coming off the surface. The sherd seems to have lost part of its internal strength. This type of attrition was noted on the inside surface of small jars, rarely on the inside of large jars, as well as on the outside surfaces of carinated bowls, small, middle-sized and large jars, sometimes located only at the base. Once, a middle-sized jar could only be recognized as such during cleaning in the field, and completely disintegrated when lifted. It is not certain what processes caused this complete destruction of the coherence of the fabric. Perhaps it is related to the original contents, but firing temperatures, fabric composition or post-depositional processes may be involved as well.

A phenomenon possibly related to the original contents of the vessel is the soft chalky and pink/whitish inner surface of some large jars and large storage pots. The original inner surface has disappeared, exposing the fabric directly under the surface. Perhaps, acidic contents (beer, fruit juices, vinegar?) of the vessels dissolved the many calcite grains in the surface of the sherd, whereupon the top surface became fragile and crumbled off. The chalky effect may be due to the fact that just below the surface of many sherds, an enrichment of secondary deposited calcite has taken place (see Appendix D). However, this suggestion must remain speculative, and the phenomenon may also have been caused by mechanical means (although this is less likely in large jars).

Some shapes were made with holes in the base (see above, and fig. VI.12). However, in some cases, holes were drilled after firing in vessels that originally did not have a base hole. This happened to a deep bowl (P92-81) in which a large base hole was drilled, and to a large storage pot (P97-284, fig. IV.67.f) in which a small hole was drilled from both surfaces in the lower vessel wall. Most probably, these holes functioned as ventilation or drainage holes to prevent rotting of the contents. Holes were drilled especially often in carinated bowls of all sizes (while holes made before firing occur mostly in small bowls, see above), in the base or lower vessel wall. Drilled holes in bowls are generally bigger than holes made before firing.

\(^{187}\) However, that not all bowls with these traces could have been used as oil lamps is illustrated by a bowl (fig. IV.36.u) with a hole in the base (made before firing) that shows similar burning patterns.
Conclusions of paragraph VI.3

Appendix G lists all functional aspects related to shape, including special surface treatments, decorations, and the existence of handles, lugs, spouts and holes in the base or vessel wall. Together with the information on the archaeological context and the traces of use, the vessels from Sabi Abyad could tentatively be assigned to twelve functional groups and a group of special shapes. As is clear from the illustration of these groups in fig VI.17, some vessels were probably meant for several purposes. This illustrates the generally practical, multifunctional character of the assemblage at Sabi Abyad.

1. Cooking pots
These vessels are defined by the coarse and low-fired fabric and rounded vessel shapes. Often the vessel wall is burnished to reduce permeability. The hand-shaping methods resulted in relatively thin walls and a very regular shape without any cracks or flaws. Rims are rolled over for better grip, but handles seem to be decorative rather than functional. The capacity of these pots varies (between about 8 and 44 litres). Many cooking pots show traces of sooting on the surface.

2. Serving, eating and drinking vessels
Middle Assyrian tableware consists of open bowls in three different size groups, very small and small jars, drinking cups and bowls, and pitchers with handles. An exceptional shape is represented by P97-193, a huge bowl probably used for communal meals. It was found in the “staff quarters” in the north of the settlement. The large quantities of carinated bowls found in Middle Assyrian settlements indicate that many of these bowls were used at meals, perhaps similarly to modern Middle Eastern “mezzeh”: a tradition of serving different kinds of food in small quantities in many small bowls. It also indicates that the bowls were easily broken and replaced. As expected, the mean capacities of the size groups in bowls roughly relate to each other as 1:3:9, reflecting individual and group portions.

3. Vessels used in food processing and craft activities
This group includes both open bowls and deep bowls and pots. The use of these vessels in processing activities is often indicated by the traces of use (abrating, damages) found on the inside of the vessel wall. The addition of spouts (for pouring liquids in a precise way), handles (to make lifting and pouring of liquids easier) and base holes is also related to the use of the vessel in other activities than storage or serving. Among vessels with handles and spouts especially the deep bowls (type 151) are interesting. They seem to have been used for separating a liquid from material floating on top or sunk to the bottom. Base holes can be functional in draining a liquid from a mixture in the vessel (in beer production, or in pressing juices from fruit), as well as in ventilating the dry contents of a storage vessel. Bowl P97-221 is an interesting variation on the vessels with base holes: a strainer is attached upside down over the base hole (see also fig. VI.11). This may suggest that strainers were used over base holes in other vessels as well. A special shape in this functional group is represented by thick, very coarse platters. They have a rough underside as if made on the ground and a thick curved rim suggesting an originally roughly circular shape. Towards the middle the platters often slope downwards. The top surface of these platters is covered in large, very sharp angular white stones (crushed calcite?). These platters must have been used for some kind of rubbing, grinding or grating activity.

4. Storage
Many different vessels could have been used for storage, either long-term or short-term, and storing dry or liquid goods. Shallow bowls are probably only suited for short-term storage, and the find of grains and garlic in such bowls proves that this was indeed done. Deep bowls provide for a more stable storage place and could have been used both for dry goods (short and long-term) as well as for short-term storage of liquids. Small and large jars are suitable for both liquids and dry storage. The finds of botanical materials and artefacts in these vessels indicate that a large variety of products was stored at Sabi Abyad.
5. Long term storage in bulk
Storage in bulk obviously took place in the huge, stationary storage pots that could contain up to 295 litres (3.5 imēru). Their thick but porous walls provide good storing and cooling properties, but they also make them too heavy to lift. Some of these vessels were coated on the inside with a bitumen layer, perhaps to reduce permeability of the wall. The inscription of the sign for water (see below and Appendix F) on some of these pots indicates that not only dry goods were stored in bulk.

6. Transport
The transport of dry goods in pottery vessels is not practical, and the use of bags and sacks would be expected instead. However, for the transport of liquids ceramic vessels are very well suited. For short-distance transport, like fetching water from a well, both jars and deep bowls may have been used. There is only a limited number of shapes in the Sabi Abyad assemblage that is suitable for the transport of liquids over longer distances, including foreign shapes like the “pilgrim flasks”.

7. Pot and jar stands
These cylindrical shapes obviously have been used to support large jars and pots. Especially the large jars are very unstable and in need of a support. Smaller supports, suitable for small jars and goblets, have not been found. Perhaps they were not used, or made of wood.

8. Strainers
Small bowls with perforated walls were most probably used as strainers. When used in combination with a piece of textile, they would even make very fine sieves. They may have been used on top of a jar rim to strain a liquid decanted in the jar, or top-side down on a base hole of a large bowl, to ease the drainage of the mixture inside. They may also have been used as cheese moulds. A special shape is represented by strainer jar P99-55 (fig. IV.95.k), perhaps also meant for making cheese.

9. Lamps
Only very few purpose-made oil lamps were found at the site. However, the small burning traces on the inside of the rim of small carinated bowls suggest that many of these could have been used as lamps as well.

10. Lids and covers
Small bowls were regularly used as lids for jars. They could only be identified as such because of their findspot on the rim of a jar. However, several purpose-made lids with different shapes were found as well (O96-45, O99-39, fig. IV.95.d, e).

11. Vessels used in burial and ritual
These bowls and jars are listed here because of their archaeological context in burials. Only the conical stand, perhaps an incense burner or the base of an incense burner, was put in this category on the basis of its similarity with incense burners in iconography (see below).

12. Measuring vessels
The only vessel that could be recognized as a possible measuring vessel is the so-called “grain measure”. Its suggested (and tentative) function is related to the division of the vessel in fixed fractions of the qû capacity measure with the help of incised lines. Otherwise these vessels may also have been used for storage or serving.

13. Special shapes
A very exceptional shape is represented by a square basin with a semi-spherical depression in the centre (P96-438, fig. IV.96.i). It was found in fragments in the upper room fill of the “residence”. The base side is covered in bitumen, while the top side is smooth and does not show any traces of use. The function of this enigmatic shape remains unclear for the time-being.
VI.4 Ceramics in their cultural context

How often do archaeologists envy their anthropologist and ethnographer colleagues, simply because of the fact that they have access to an important source of information on material culture: they can observe contemporary people producing and using artefacts, and can ask them all they want to know. In archaeology, however, we should not forget that contemporary sources are available. Unfortunately, these are often studied in different scholarly spheres (philology, art history), and only few archaeologists fully exploit these sources. Nevertheless, especially in a chapter on the function and use of our pottery vessels, we should ask the Assyrians themselves how they viewed their pots. In this paragraph, we will look at evidence from Middle Assyrian cuneiform texts and iconography.

Ceramics in contemporary texts

Information about the use of pottery can be gauged from contemporary texts. In theory, several kinds of information are available: lexical lists in which vessel names are listed; lists of vessels (inventory or delivery texts); receipts listing vessels for their contents; and letters, contracts and literary texts from which we can learn something about the context in which certain vessels were used (cf. Jamieson 2000: 279, Potts 1997: 139-140). Unfortunately, Middle Assyrian texts are mostly silent about ceramic vessels, as opposed to Early Bronze Age texts (cf. Sallaberger 1996, Steinkeller 1996). There are several difficulties related to the study of texts with the aim of understanding the function or use of ancient vessels. First, and this is also attested in ethnographic situations, the names used for particular vessel types may vary, between periods, locations, situations of use, or between people from different social groups. Thus different names may relate to similar or identical vessels, or identical names may refer to different vessels. A vessel name in a text may also be a generic name like “container”, “pot”, including different shapes without being more specific. Second not all vessels attested archaeologically are necessarily present in the preserved texts, and not all vessels mentioned in texts are always found in an excavation. Vessels described in texts may be rare vessels used in specific ritual or industrial contexts, so that their recovery depends on the archaeological context. Or vessel names in texts may be archaic, and no longer in daily use (especially in the case of lexical lists). Thirdly, it is not always clear whether a vessel name designates a pottery vessel or a container made from another kind of material (metal, wood), although in many cases the determinative DUG is used for pottery vessel names (Sallaberger 1996: 109). And last but not least, the archaeologist’s concept of a vessel type, shape (group) or class is most likely different from the Assyrian perception of the kind of vessels that could be identified by one name. Where the archaeologist’s typology would be based mainly on shape and size, the Assyrian classification (and identification) may also be based on functional groups, or on the situation in which a vessel is used. However, either the context of the vessel name in the text (for example mentioning the vessel contents) or the name itself (e.g. providing indications of its shape or size) give us some clues as to the ancient function or use of the vessel. This very fragmentary textual evidence can be compared to the actual shapes, sizes and other functional indications of the vessels found in the archaeological context and discussed above.

The textual evidence from Sabi Abyad relating to pottery vessels is presented in Appendix F, including drawings, transcriptions and translations of the texts. Below is a list of all vessel names in alphabetical order, from the texts found at Sabi Abyad and from other Middle Assyrian texts. Together with the vessel names, any other available information is listed concerning the material, capacity, context and content of the vessels as described in the texts. As an exercise, some vessel names for which the function seems a little clearer are tentatively combined in fig. VI.18 with the functional shapes defined earlier, in an attempt to identify which vessels the Assyrians had in mind when using these vessel names. This is based on the assumption that most vessel names in texts are related to or refer to the material reality.  

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188 Compare for example the names and shapes of vessels from different villages in Ionas 2000: 30-99 and tables 1-5.  
189 The present study, focussing on Middle Assyrian material, yielded 36 names for ceramic vessels. In comparison with the number of different shape groups and the relative uniformity of the corpus, this suggests that several different names may have been used for vessels that look similar to us.  
190 For other texts, the bibliographical reference will be given in a footnote when the text is first mentioned, to avoid unnecessary cluttering of the text and alphabetical list with references.
Although the resulting table (fig.VI.18) looks clean and clearcut, we have to keep in mind the numerous uncertainties just mentioned, and more textual and archaeological evidence is likely to change the picture presented here.

The 35 vessels of ten different kinds mentioned in Sabi Abyad text T98-131 were part of an inventory, probably related to a ritual occasion (see Appendix F). Other inventory lists dealing with pottery vessels and other items have been found at Middle Assyrian Aššur: KAV 118, MARV I no. 58, MARV I no. 7, MARV I no. 29, KAJ 277 and 317, MARV III no. 9, MARV IV no 146, KAJ 310, Lutz 1927: 104 no. 46. Sometimes they list large amounts of vessels, but mostly numbers are small as in the Sabi Abyad example. The reasons behind making such lists are not always clear or mentioned in the texts. Some lists deal with the vessels only, others mention the vessels as containers of honey, flour, cress or other foodstuffs, or as containers of cuneiform tablets. Sometimes the vessels are property of a particular person (as in KAJ 317); other lists give the impression that the vessels were part of the contents of a store room or brought into storage (MARV III 9: 23-26; KAJ 310). Vessels mentioned in inventory lists are

Other texts containing vessel names are texts related to production, for example of beer or perfumed oil, as in KAR 220. Vessels mentioned are agannu, diqårū, ḫari’u, hersu, kāsu, maššalu, sītu, šappatu. Several texts are related to rituals (describing either the ritual or the deliveries for a ritual: KAR 139, KAR 154, Ebeling 1948: 19a, VAT 16435, MARV III no. 16, MARV VI no. 35). Vessels occurring in these texts are diqårū, ḫasḫu, kallu, kāsu, kirru, laḫannu, mākalitu, maqqû, nīgakkû, pursîtu, quûtû, saḫḫarru, sītu, šappatu, tāllu.

Other texts containing vessel names are texts related to production, for example of beer or perfumed oil, as in KAR 220. Vessels mentioned are agannu, diqårū, ḫari’u, hersu, kāsu, maššalu, sītu, šappatu. Several texts are related to rituals (describing either the ritual or the deliveries for a ritual: KAR 139, KAR 154, Ebeling 1948: 19a, VAT 16435, MARV III no. 16, MARV VI no. 35). Vessels occurring in these texts are diqårū, ḫasḫu, kallu, kāsu, kirru, laḫannu, mākalitu, maqqû, nīgakkû, pursîtu, sītu, šappatu. Pottery vessels occur less often in letters or economic texts (cf. Sabi Abyad T93-3, Appendix F, mentioning tariḫu vessels).

The list of vessel names below shows that Assyrian vessel names mostly indicate the function or form of the vessel rather than the material it was made of. So vessels with similar names could have been made of pottery but also of metal, wood or stone. The chances we will recover the latter are slight: metal will have been recycled and wood has not been preserved. Stone vessels, especially the larger ones, occur mostly in contexts of extreme (sometimes literally fantastic) luxury, and cannot be expected in settlements of ordinary people. Some vessel names suggest that they may be used as a generic name for “container”. The majority of vessel names is feminine (F.A.M. Wiggermann, personal communication).

Apart from the measuring-vessels (like sītu), vessels in texts do not seem to have specific capacities (a vessel name is not linked to a set capacity). Nevertheless, the capacity of a vessel is sometimes mentioned (for example in KAJ 277: “x šappatu vessels measuring 1 sītu”, MARV III no. 9: 26: “5 šappatu vessels of 42 ġū for measuring”). Or the amount of the material in the vessel provides an indication of vessel size. In this way, in the texts dealing with the preparation of 2 sītu of perfume (e.g. KAR 220), the decanting of the mixtures in certain vessels suggests that these vessels had capacities larger than 2 sītu. In some cases it is consequently clear that we are dealing with small vessels (e.g. kallu, kāsu), while others must have been very big (e.g. ḫari’u). The indications of capacity in fig.VI.18 are mostly based on this kind of rather circumstantial evidence. In only one case the name of a vessel could be connected with the shape and size of an actual vessel. In Tell Hamidiyah, a Neo-Assyrian large closed storage pot was identified by an inscription

191 Schroeder 1930/31, also discussed in Appendix F of this book.
194 Freydank 1976b, cf. the edition of Harrak 1990, which is followed here.
200 Menzel 1981 (vol. 2) no. 1, transcription and translation; Oppenheim 1965, translation and analysis.
201 Menzel 1981 (vol. 2) no. 2.
202 Menzel 1981 (vol. 2) no. 3.
204 Freydank 1994.
205 Freydank and Feller 2005.
242
The texts often give clues as to the specific use of the vessel in the particular context the text is dealing with. So, texts will mention “so many jars for oil” or “decant the perfumed oil in so-and-so vessels”. The large majority of all vessel names is connected to the storage, consumption, production or libation of liquids. They include water, beer, wine, vinegar, oil and honey as well as perfumed oil. A few vessels, including the ḫari’u, the kallu, the kirru, the mākaltu, and the sūtu, are used for both dry and liquid foodstuffs. Only the qulli’u is exclusively mentioned in connection with dry goods.

Alphabetical list of Middle Assyrian pottery names
Compiled with the assistance of F.A.M. Wiggermann.

The list includes items from a selection of MA texts, specifically those with relevant contexts and those published after the dictionaries. The lemmata are cited in their MA form; NA and NB material has selectively been included. Only vessels that are attested as being made of pottery have been included. The Sabi Abyad texts are discussed in more detail in Appendix F.

**agannu** (a large bowl)
Sabi Abyad T98-131: 5 (DUG.a.); KAV 118: 7 (pl.); Harrak 1990: 10 (pl.); in recipes for perfume see Ebeling 1948/50: Glossary (DUG.a.).
Sallaberger 1996: 110 (Krug).

An agannu is usually made of metal or stone, seldom of pottery. It is a large bowl or basin, sometimes with a stand. It is used for soaking the aromatics during perfume preparation, for oil or water, and in rituals. In the perfume recipes its capacity seems to lie between ḫari’u and kasu, perhaps 1/4 смерт (= 25 qû). CAD suggests that it had a diameter of 60 cm or more.

**diqāru** (a deep bowl for serving and heating)
Postgate 1979a: 90.28 (2 d.’s of bronze, domestic; with 1 saplu and 2 kappu of bronze); Freydank 1980: 108 iii 8 (one of the richer families of ḫurrian deportees in KTN owes a d. of bronze); Cancik-Kirschbaum 1996: no. 6: 29f. (transport of oil on donkeys in d.’s of bronze); recipe for perfume KAR 220 i 2, ii 1, 17 (placed on fire), iii 5’, 11’ (covered), 14’ (placed on fire) 15’f., iv 3’ (covered), 7’206; in ritual: KAR 154: 15’.

A diqāru can be made of metal (or stone), or of pottery. It is a deep bowl with a round base, used for serving and heating, such as a cooking pot or cauldron. It is found among household utensils and is used for boiling. It has soot on the surface. It is used for meat broth. In perfume preparation it is used for heating, brewing and mixing the mixture of water, oil and aromata. The volume of the ingredients in the perfume recipes suggests that some diqārus had a capacity of at least 2 sūtu.

**ḥanṣubu (ḥanṣabu/ḥaṣṣabu)** (a potter’s waste product)
In the MA text (Harrak 1990: 20) it must be something countable, presumably a type of vessel: “(fired) waster” fits the evidence. Harrak 1990: 20 (1 ḫa-an-ṣā-bu, rather than ḫa-an-zu-bu).

In the lexical lists this word is equated with the Babylonian word for “potter’s waste”, ḏē paḫāri, literally “potter’s excrements”. The existence of a “millstone for potter’s excrements” shows the use of ground sherds, “grog” (CAD Z 151).

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206 Cf. Ebeling 1948/50 Glossary for further attestations.
Chapter VI: Function and Use

ḫapāltu (a container)
Listed in the dictionaries under ḫapālu. Sabi Abyad T98-131: 7 (sg. DUG.ḫa-pa-al-tu); KAV 118: 6 (pl. ḫa-pa-la-tu). The fact that this word occurs only in these two texts confirms their common background; see also Appendix F.
Sallaberger 1996: 111 (ein Behälter (aus Ton??)).

ḫari‘u (a large container)
Recipe for perfume KAR 220 i 3, 5, 17
NA: two earthenware ḫari‘us in a household (Deller and Finkel 1984: 32).

A large container (pot, kettle or tub) made of pottery, also of metal, sometimes with a stand. In Tell al-Hamidiya ḫari‘u can be identified from a NA inscription on a large storage pot with a sketch drawing of a closed pot with a pointed base (Deller 1990: 334, pl. 20.1). In perfume preparation the heated mixture is poured into it and left to stand overnight. It is also used to collect oil. It is used for storing barley, water and wine, and in rituals. It is a large container, at least 2 śūtu, or 2 imēru?

ḫaṣbu pottery, terracotta, pot sherd; small pot (waster? cf. ḫaṣabu)
In ritual: KAR 154: 15’ (Menzel (1981 vol. 2 no. 2) translates “ḫaṣbu-Gefäss”).
Sallaberger 1996: 112 (variant of ḫaṣabu; Scherbe, (gebranntes) Tongefäss).
NA: used in cult; contains perfumed water for the hands of the king during his meal (Müller 1937: 59ff.). In NA the ḫaṣbu pot can be made of precious metal (AHw ḫaṣbu III.3)

ḫersu (AHw) / ūrsu (CAD) (a vessel) (AHw), (a bowl) (CAD)
Recipe for perfume: KAR 220 passim.
Sallaberger 1996: 112 (?).

A pottery or stone bowl. In the perfume recipes the mixture is decanted through a cloth into this vessel, and decanted from ḫ-vessel to ḫ-vessel. The volume of the ingredients in the perfume recipes suggests that a ḫersu had a capacity of at least 2 śūtu.

ḫupā‘u (ḫupû) “(broken) vessel of ½ qû”, pl. “sherds” (cf. CAD ḫupā A, B, and ḫupa‘u)
KAJ 310: 37 (domestic, to store tablets).
Sallaberger 1996: 112 (Bruckstück).

The meaning is derived from ḫepû “to break”, and indicates a sherd or broken vessel or a vessel of ½ qû. Perhaps it is also used for reused broken vessels (or sherds) of other sizes. Possibly, ḫupā‘u (and/or mišlu, see below) was used for the “grain measures” divided into ½ qû fractions described above?

ḫuruppu dish
Sabi Abyad T98-131: 2 (DUG.ḥ., see the commentary in Appendix F); MA Laws Tablet A ¶ 42 (KAV 1 vi 17, 20; for a banquet).
NA: of copper, in household (Postgate 1970: 152:3).

Only in the Sabi Abyad text this (ritual) vessel is made of pottery, a sure sign of poverty; elsewhere, earlier and later, it was always made of metal.

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207 Cf. Ebeling 1948/50 Glossary for further attestations, also wr. DUG.ẖ.
208 Cf. Ebeling 1948/50 Glossary for further attestations.
209 Schroeder 1920.
ildu base, foundation, potstand

kablu leg (CAD kablu: of a chair, bed, table, potstand; add: vessel)
MARV I no. 58: 1f. (kallu ša ka-ab-li); MARV VII no. 102: 22' (kap-pu ša [ka-ab-li(?)]); KAJ 121a:3\(^{211}\) (GIŠ.BAN, ša ka-ab-la-a-te.MEŠ).

In MARV I no. 58: 1f. kallu ša ildi varies with kallu ša ka-ab-li, apparently as kallu with a “potstand”, and kallu with a “leg” or “foot”; the second occurrence of ša ka-ab-li in this text remains unexplained. Probably comparable is MARV VII no. 102: 22’, where a Kassite messenger receives as honorary gift a kap-pu ša il-di and a kap-pu ša [ka-ab-li(?)]. In KAJ 121a: 3 there is a sūtu measuring vessel ša ka-ab-la-a-te.MEŠ “with legs” used for measuring corn in the meadow. The passages MARV I no. 58: 1f. and KAJ 121a show that kablu denotes not only the leg of a pot stand (CAD), but also that of a vessel. KAJ 121a shows that a larger vessel (sūtu) may have more than one “leg”. In NA kablu may denote a “(potstand with a) leg (or: legs)” (CAD kablu mng. d).

kallu bowl
Sabi Abyad T98-131: 6 (DUG.k); KAV 118: 2; MARV I no. 58: 1 (ša kablī), 2 (ša īldī) “with legs”; Harrak 1990: 6 (ša agarīmūr), 7 (small k.'s ša šaplišī), 9 (18 kal-lī GI ŠE.MEŠ, “en roseaux de grains”??), 14 (pl., sērūtu “covered with a clay slip”, for the meal of the king); in ritual: Köcher 1952 (VAT 16435): 192ff.: 16 (with flour to be scattered over a roasting lamb); passim in MARV III no. 16 (offering list), with foodstuffs. In this text (except once) kallu (sg. or pl.) is determined by GIŠ.ŠE, probably the same as GIŠ.ŠE.MEŠ determining kallu pl. in Harrak 1990: 9. Donbaz 1988: 70 no. 2:5: 10 kal-lu ša NINDA.MEŠ KUR,RA, “for making(??) thick bread”.
Sallaberger 1996: 112 (Schale).

In MA kallu is one of the most common types of container (Harrak 1990: 70-75). CAD translates “bowl” (meaning indicated by “crown of the skull” and “shell of the turtle”). It could be made of reed (?), pottery, wood or metal, and was part of the normal household equipment. It was used to store or serve foodstuffs, flour, salt, oil, water, etc. It was also used for washing the hands or fingers. Harrak 1990 shows the existence of a small and a large kallu.

NA: K.Radner (1997: 253ff.) treats the phrase kallu saḫḫarru “Topf (und) Schälchen” in NA testaments; these are the humblest objects in the household, and occur as an expression meaning to say “really everything”. The Sumerian equivalents dug.bur.zi.gal and dug.bur.zi.tur show that the terms denote a bigger (gal) and a smaller (tur) vessel of the bur.zi type. DUG.BUR.ZI is the logogram of pursītu (in fact a loanword from the Sumerian), which suggests a series of ascending size but comparable form or function: saḫḫarru – pursītu – kallu.

kannu “wooden rack for storing containers”, “metal pot stand”, “(a small container)”
Cf. Donbaz 1990: no. 133, concerning wine “for (on) the potstands”, that is: to be served.
Sallaberger 1996: 112 (Gefässständer).
NA: 6 kannus of iron weighing 30 kg each (Postgate 1970: 152:15, inventory of a household).

A kannu is not a pottery vessel, but a metal or wooden stand used to support (pottery) containers. It is sometimes used under the nazzitu beer–vat in rituals. It can be a stand to support pots with a pointed base, or a rack to hold cups. Cf. figs. VI.19, 21, 28 for MA, figs. VI.35, 38, 39, 41, 42, 43 for NA scenes.

\(^{210}\) Freydank and Feller 2006.
\(^{211}\) Postgate 1988:187f. no. 75
kāsu  
cup, bowl, small drinking vessel, subdivision of the qû
Inventory MAH 16130: 100:1622 (1 ka-su ŠU.2 “one two-handled cup/bowl”; domestic); recipe for perfume KAR 220 i 1623 (for measuring, ina kāse šēherte, “with the small kāsu measure”); in a ritual: Ebeling 1948/50: 19a+: ii 9’, 15’f. (bowl for beer), 18’ff. (ša šarpî “of silver”); MARV V no. 69: 5’, 7’24 as a subdivision of the qû (probably 1/10th, as in NA); probably as a measure also in MARV III no. 58625 (1 ka-sî I, persâdûhhe, “one cup of balsam oil”).
Sallaberger 1996:113 (Trinkgefäss).

NA: cf. Radner 1999/01: 17-23: a kāsu “goblet” inscribed “Stadtherr von Zarâtu”; the form is typically NA, and used for drinking wine; ibid. 21f., Trinkschalen als Ehrengeschenke: it would be this type of kāsu that has a capacity of about one tenth of a qû (0.084 litre). In NA the “qû of the king” is a standard for the measure of wine; the wine records also use kāsu (“cup”) as a subdivision of the qû (probably 10 kāsu = 1 qû), see CAD kāsu mg. 2, Powell 1987/90: 502, referring to Kinnier-Wilson 1972: 110-120 (CTN 1). This gives a general indication as to the capacity of the “cup”: approximately 0.08 litre. Except for the few attestations as a capacity measure, kāsu is apparently not normally used in MA or NA (although common everywhere else in the LBA). Large (dannâtu) k.’s are used for drinking during the meal of the king (Müller 1937). Metal kāsu are very common in NB dowries (Roth 1989/90: 25; once DUG’GU2ZI).

A small pottery or metal drinking cup, for wine, beer, and for measuring (balsam, perfume).

kirru  
(a large vessel), (a standardized container for beer, not in MA)
Sallaberger 1996: 113 (ein grosses, offenes Gefäss).

A kirru is a large (storage) vessel of pottery, metal or stone, possibly with a neck. It is used for flour, ghee, water, milk, beer, fat, oil, lard, perfume, wine, and honey. It is also used for libations.

kukkubu  
(a small container)
Sabi Abyad T98-131: 4 (DUG.k.); KAV 118: 4; MARV I no. 7: 17 (DUG.k. pl.); Harrak 1990: 19 (pl.);
Sallaberger 1996:113 (Flasche).

A kukkubu is a small container or flask, made of pottery, metal, stone or glass. It serves as an alabastron, libation jar and drinking flask, for perfume, beer and oil. Its capacity lies perhaps around 5 qû?

kītu  
(a container)
KAJ 317: 9 (3 DUG.ku-ta-tu, coll., CAD K 612a reads here ku-û-tu).
Sallaberger 1996: 113 (Eimer/Kessel/grosser Topf).
NA: earthenware k. in household (Deller and Finkel 1984: 76ff.:34).

Made of pottery or metal, rarely of wood. Used for the storage and serving of liquids (oil, milk, beer, wine, soup). A metal one weighing about half a kilogramme (i. e. relatively small) used for storing and serving liquids may have had a long spout “like an elephant” (CAD disc. sect.).

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212 Postgate 1979b.
216 Freydank and Saporetti 1989: 44, 82.
lahannu (a bottle)  
KAV 118: 3; in ritual: Köcher 1952 (VAT 16435): 192ff.:2 (6 l. NA₄.ZA.GIN₃ ku-ri “aus künstlichem Lazurstein”, with wine, votive of king for deities), 17’f. (with wine, with beer for libation), 23, 27, 30 (with wine for libation).

A lâhannu is a bottle made of pottery, glass, precious metal or stone. It can be closed with a stopper. It is used for beer (sometimes called “tavern keeper’s bottle”), water, milk, wine, honey, and objects. 7 bottles can be put on a brazier. It is also used for washing the hands. In rituals it is used for libations and medications. Its capacity is perhaps around 1 qû?

mâkaltu (a bowl or shallow saucer)  
In ritual: KAR 139: 6 (for offering food); KAR 154 passim (for offering bread).
Sallaberger 1996: 114 (Ess-Gefäss).

A mâkaltu is mainly made of wood, but also of pottery or metal. It is a shallow eating or serving bowl (the word is derived from akâlu, to eat). It is also used in libations with beer or dates, figs, bread or oil. It occurs in dowry lists and inventories. Its capacity is perhaps around 1 qû?

makkasu (makkasu) (a bowl)  
Sabi Abyad T98-131: 3 (DUG.m.); KAV 118: 8.
Sallaberger 1996:114 (?).

Made of pottery or metal.

malîtu (a small bowl)  
MARV IV no. 146: 5’ (1 ma-li-tu ša I, su-ni a-na nap-šu-u[s x x] “one malîtu-vessel with filtered’ oil for anointing [x x x]), 7’f. (2 ma-li-a-tu ša I SILA₃.TA.AM₃ I₃, 2 m.-vessels with one qû oil each). The reading of the sign –li– is uncertain, it looks more like –šar- or –šîr-, which does not result in a satisfactory solution (mašîru? maššaru?).
All other attestations are NB.

Made of pottery or precious metal.

maqqû libation bowl or goblet  
In ritual: KAR 139: 7 (beer).
Sallaberger 1996: 114 (Libations-Gefäss).

marsattu (a large vessel), derived from rasânû “to soak, to steep, to brew beer”  
Sallaberger 1996: 114 (“Durchfeuchter”, “Einweicher” (in der Bierproduktion)).

A marsattu is a large soaking or mixing vat, used in beer production. It is also used to store cuneiform tablets, and for milk.

mašḫulu strainer  
KAR 220 i 17 (perfume recipe); MARV VI no. 75:2f. ²¹⁷ m. of  bu-ra-li (a type of stone), and GIŠ.al-la-ni (a type of wood).
Sallaberger 1996: 114 (mašḫulu, Sieb).

²¹⁷ Freydank and Feller 2005.
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A strainer of pottery (not attested in MA), wood, metal, stone or glass, used for straining beer and during perfume production. Given to (?) bakers and brewers in MARV VI no. 75.

mišlu (a half-size container)
Harrak 1990: 18 (preceded by sūtu) (for foodstuff); KAJ 277: 4 (DUG.m. ša x x [...]); 5 (baltate “intact”); KAJ 310: 28 (domestic, to store tablets).

nazzītu (namzītu) (fermenting vat)
Sabi Abyad T98-131: 8 (DUG.n.).
Sallaberger 1996: 115 (Bier-Gärgefäss).
A n. occurs sometimes in NB dowries (which implies domestic, non-specialist brewing), Roth 1989/90: 27.

A nazzītu is a large vessel used for the preparation of beer. It has a hole in the base, and is used over a vessel or stand (kannu) under it. See also the discussion of beer production below in this chapter.

nignakku censer
KAV 118 rev. (large and small n.’s); in ritual KAR 139: 9 (incense scattered on a censer, ni-id-na-ki for nignakku; a metal censer šēḥtu occurs in the same text).

A metal or pottery censer or censer-stand, used for burning aromata in rituals. Small and large nignakkus exist.

pursītu (a bowl)
Sabi Abyad T98-131: 9 (DUG.p., pl.); KAV 118: 5 (pl.); MARV I no. 58: 4; MARV III no. 16 ii 13’, iv 18 (offering list); MARV V no. 46: 818 (DUG.BUR.ZI, to store drugs).

A cultic and drinking bowl of pottery, metal, wood or stone, used in rituals.

qullī’u (a bowl)
Harrak 1990: 11 (with flour).
Sallaberger 1996: 116 (?).
NA: bowl or plate used by someone during a meal (Müller 1937).

A bowl of pottery or metal, for food or flour.

sahḫarru (a small bowl)
Sabi Abyad T98-131: 10 (DUG.s.); MARV I no. 58: 3 (the only MA attestations).
Sallaberger 1996: 116 (eine im Kult verwendete Schale?).
NA: see above with the comments on kallu.

A small bowl used for oil, honey, dates, groats, fruit (often in rituals); among household equipment.

sūtu (a measuring vessel)
Lutz 1927: 104 no. 46 (1 DUG.BAN, PN); Harrak 1990: 18 (DUG.BAN,MEŠ, followed by mišlu); KAJ 277: 3 (ša kud[i]mme “with cress”); MARV III no. 9: 23f. (x DUG.BAN,MEŠ, of PN the alahīnnu, of the storeroom); KAJ 310: 39 (to store industrial materials in); in recipes for perfume (Ebeling 1948/50 Glossary); in ritual Ebeling 1948/50: 19a+ i 3’, ii 9ff. (with beer); Jakob-Rost 1991: 62 nos 37-40 (sherds of vessels inscribed 1 BAN, SUMUN “1 altes sūtu-Mass”).

218 Freydank and Feller 2004.
A pottery, metal or wood container or measuring vessel of a standard capacity, and its volume. It is used for oil, barley, flour, chick peas, and cress. It is used by the baker, the perfume maker, in the storeroom, and for rations. It is also used with beer in rituals. There are various different šūtu measures in the MA period, among which large and small ones. In Sabi Abyad 1 šūtu equals 10 qû.

There is, however, no identifiable group of pottery vessels at the site that has a standardized capacity of 1 šūtu (ca. 8.4 litres).

ṣurṣappu (CAD: a container provided with teat-shaped protuberances; CDA: a container with knobs)
MARV VI 35:41 (for beer during offerings to gods). Apart from the one MA attestation this word occurs only in Lexical Texts.

šappu (a container)
NA: twenty š.-jars in a household (Deller and Finkel 1984: 76ff.:31)

A pottery jar, bottle or storage vessel. In perfume preparation the prepared perfumed oil is strained through a cloth into this vessel at the end of the preparation. It is also used for making wine and vinegar and for the storage of honey, ghee, oil and beer. It is used in ritual as well as for measuring. It occurs with a stand. Its capacity is perhaps between 2 qû and 4 šūtu 2 qû?

tabilu (a pottery vessel)
In recipes for perfume (Ebeling 1948/50 Glossary).
Sallaberger 1996: 117 (zu abâlu D “trocknen”?).

tallu (oil vessel)
KAJ 310: 30 (domestic, to store tablets).
Sallaberger 1996: 117 (ein Gefäß besonders für Öl).

An oil vessel, possible capacity 8 qû?

tariḫu (a vessel)
KAJ 169: 29 (DUG.ta-ri-ḫu), Sabi Abyad T93-3: 16 (beer and DUG.ta-ri-ḫa-te); Donbaz 1992: 119f. 17, 20 (2 šūtu of beer, 2 DUG.ta-ri-ḫa-tu, 1 šūtu of good bread for the journey of Ninurta-tukul-Aššur; 2 šūtu of beer, 1 DUG.ta-ri-ḫu, 1 šūtu of bread were delivered, by order of Ninurta-tukul-Aššur, when Buza dressed the divine statues in the town of [...na ]; in Tell Chuera (DUG.ta-ri-ḫa-te GIBIL cf. Jakob 2003:407).?

Is associated with beer, but probably not used for beer production, storage or transport. For serving beer? To be delivered by the brewer together with beer for immediate consumption. Mentioned in connection with brewers.

²¹⁹ Schroeder 1920.
Ceramics in a culinary context

It has been suggested (e.g. Lesure 1998: 20, Henrickson 1990: 85) that the majority of the primary functions of ancient ceramics involve the storage, transport, preparation and consumption of foods and liquids in a domestic setting. This raises questions as to what kinds of foods and liquids were consumed in a household or processed in a workshop or kitchen. The reconstruction of ancient diets and recipes is based mainly on textual and botanical or archaeozoological evidence, but architecture (kitchens, ovens, kilns) and artefacts (grinders etcetera) are also important. At Sabi Abyad, all these sources are available. However, since none of this information at Sabi Abyad has been fully published yet, our interpretations must remain of a general nature.

Many and varied foods and drinks were available in Mesopotamia. Texts and archaeological materials give evidence of barley and wheat for porridges, many types of bread, and beer. Sesame is important as well. Fruits include grapes, apples, dates, figs and pomegranates, and could also be used dried, as a juice or as a syrup. Olives and olive oil were used, as well as onions, leeks, garlic, cress, almonds and pistachios. Spices included salt, mustard, cumin and coriander. As to the animal sources, beef, sheep, goat, deer, pig, fowl and fish were consumed, either fresh or salted. Animals were also exploited for their secondary products: eggs, milk, butter and many kinds of cheese (Curtis 2001: 193-194, Ellison 1984b). One of the most expensive drinks was wine, imported from mountainous regions.220 The production of wine in southern Mesopotamia is not attested before the first millennium BC. However, it was produced in Northern Mesopotamia where grapes could be grown more easily, for example at Carchemish, and in the Levant (Zettler and Miller 1996, Powell 1996). A Middle Assyrian text of unknown provenance, but possibly from Tell Sheikh Hamad / Dur-Katlimmu, discusses the registration of small agricultural plots with vineyards and fruit trees (Fales 1989).

Textual sources from Sabi Abyad indicate, however, that the daily diet of most of the inhabitants of the *dunnu* was much less varied and luxurious. The staple food of the *dunnu* dependents consisted of bread (or other dishes made from grain), onions and beer, sometimes with the addition of some cress. Beer and bread were centrally distributed to the staff (and to visitors), and were prepared by the baker and brewer (F.A.M. Wiggermann, personal communication). In much smaller quantities, lentils, fennel, chick peas and oil were consumed as well, but fruits were virtually absent (apart from some nuts). Honey/syrup was probably not consumed on a regular basis by everyone. The spices included coriander, cumin, black cumin, possibly mint and some unidentified spices (Wiggermann 2000:197). Sesame is attested in the texts as well as in the botanical material and was used to press oil (Wiggermann 2000: 197, Van Zeist 1994: 546, Bottema and Cappers 2000). The texts do not contain any information on the consumption of meat or milk products (Wiggermann 2000: 198), but it is likely that milk products such as butter or cheese221 formed a substantial part of the diet, especially in the light of the large amounts of sheep in the care of the settlement. The botanical evidence from the site is only partly published (Van Zeist 1994, Bottema and Cappers 2000), but cereals (barley and wheat) form the bulk of the material. Sesame and garlic are also attested in the botanical material. Ovicaprids (sheep and goat) are dominant in the archaeozoological material (as yet unpublished). Pork and beef were much less used. The faunal remains also indicate that gazelles were hunted. The use of the meat, fat and skin of the wild boar is attested in the texts, while fallow deer is present among the faunal remains (Wiggermann 2000: 179, 198). Furthermore, it seems that ostriches were known at the site, and doves and other birds were eaten (Wiggermann 2000: 200-201). Beer was the most important drink apart from water; wine is not attested in the texts from Sabi Abyad.

Serving and eating customs

Some information about eating customs in Mesopotamia can be deduced from iconography and administrative texts on food issues, collected in the work of E.R. Ellison (1978). Although most texts and scenes on seals and reliefs deal with banquets of kings and other important figures as well as with ritual banquets and food offerings to the gods, some general ideas about the eating habits of common people might

220 Analysis of residues in vessels has proved that wine was drunk already in prehistoric Iran (McGovern et al. 1996), in Egypt at least since the First Dynasty (Murray et al. 2000) and in Old Assyrian times (Wartke 1997: note 30). A Middle Assyrian text (Freydank 1994 (MARV III) no. 23) discusses the delivery of wine for cultic purposes.
be taken from these. It seems that in these higher circles throughout Mesopotamian history it was customary for servants to bring food in small portions or in small bowls to the diner. A small cup could be held in the hand, while larger jars were sometimes set to the side of the scene. Tables were present but served only as sideboards to hold the prepared dishes. Although all diners in these scenes are seated on chairs, it is unlikely that ordinary people all ate while seated on chairs at a table.\textsuperscript{222} There are few indications for the use of cutlery,\textsuperscript{223} and it seems most likely that the food had been prepared in such a way that it could be easily scooped up with the fingers or a piece of bread. Elamite prisoners shown in reliefs of the Neo-Assyrian period are seated on low cushions and either eating food in individual portions or reaching into one common vessel or into a pile of food in the middle of their group (fig. VI.36, 37; Ellison 1978: 246-253). Even when iconographic evidence for the Middle Assyrian period is very meagre, it may be reasonable to suggest that people at Sabi Abyad used small bowls to hold spices, cheese, or side-dishes like onions, while the main fare of their meal consisted of flat bread baked in the numerous tannurs found all over the site. Larger bowls could have been used to contain dishes prepared for a group of people (stews, porridges, bulgur, etc.) and placed in the middle for all to reach into. Serving dishes for small amounts, individual portions and group portions may therefore be expected. Middle Assyrian vessel names possibly fitting these descriptions are \textit{kallu} (a rounded bowl in two sizes, small and large), \textit{kāsu} (a very small bowl or cup), \textit{mākalatu} (eating bowl), \textit{saẖarru} (a small bowl) and \textit{qullīʾu} (a bowl) (cf. fig. VI.18). Mats could have been used as an underlay for bread and other dry foodstuffs. The shape of the goblets suggests that the custom of holding a drink in the hand was prevalent in Middle Assyrian times,\textsuperscript{224} but water and beer could also have been drunk from small bowls or from the smaller jars. Middle Assyrian vessel names related to drinking are \textit{kāsu} (drinking cup or bowl), \textit{kukubbu} (a small jar or drinking flask), and perhaps \textit{lahannu} (a bottle) (cf. fig. VI.18). See below for the scarce iconographic evidence on eating and drinking customs.

**Cooking methods**

In the Mesopotamian kitchen several methods for food preparation were available. These include the baking of flat bread in a tannur oven, the baking of other types of leavened or unleavened bread in closed ovens or hearths, the roasting of grain and meat over a fire, drying, pickling and salting, as well as different methods of boiling in pots (Curtis 2001: 194-195, see also Bottéro 1987, 2004). Only the method of cooking in a liquid required the use of cooking pots. A scene from a Neo-Assyrian relief shows how cooking could have proceeded (fig. VI.39). Two kinds of cooking pots are known from the “Yale Culinary Tablets”, dated to the Old Babylonian period. One is the \textit{diqāru}, usually made of pottery but also of metal, and also known from Middle Assyrian texts. J. Bottéro expects that the capacity of a \textit{diqāru} was rather large, in any case exceeding 6 litres. The same vessel name is also used in Mari for pots to contain dough set aside to rise, for cooking oils and preparing perfumes (see below; Bottéro 2004: 50-51). The other pot mentioned in the Mari texts, the \textit{ruqqu}, is a metal cooking vessel and does not concern us here.

Although several of the foodstuffs attested at Sabi Abyad require cooking rather than roasting or baking (including lentils, porridges made from grain, meat if used in soups or stews instead of roasted, and milk products prepared with heat), it is remarkable that pottery vessels recognized as cooking pots only constitute a very small proportion of the total assemblage (less than 0.4%). Several explanations may be offered for this phenomenon. Firstly, it may be suggested that cooking was not a much-used method for food preparation at the site (cf. Frankel and Webb 2001: 125). The staple foods show that cooked foodstuffs did not form a large proportion of the diet. Bread, beer and onions do not have to be cooked, while the meat that was occasionally eaten could have been prepared by roasting. Although tannur ovens and hearths are found in all buildings at the site, cooking vessels are much less common, and perhaps not every household used them. The fact that many cooking pots were imported, and that there does not seem to have been a local cooking-pot production tradition, may suggest that cooking in pottery vessels was not a common practice among the Assyrians living at the \textit{dunnu}. Interestingly, the largest and best preserved cooking pot (P93-308)

\textsuperscript{222} Texts listing inventories of Hurrian deportees list some chairs and tables among their possessions; however, never enough to seat the whole family (Freydank 1980).

\textsuperscript{223} Bronze knives are occasionally found at Sabi Abyad, but no spoons or forks or similar instruments. Metal or wooden spoons are known from Middle Assyrian texts (e.g. in a list of private property, Postgate 1988: KAJ 310, \textit{itqāru}).

\textsuperscript{224} Later Neo-Assyrian iconography shows elaborate banqueting scenes. In these scenes, depicting the elite, people drink (wine?) from shallow bowls and from goblets. These vessels are never set on the tables which are laden with food items. Servants stand aside to fill the cups when necessary (cf. e.g. Stronach 1996).
comes from a room in the north of the settlement that is characterized by many hearths and by other special vessels, suggesting that this room was not a normal domestic kitchen. Perhaps cooked dishes were served from there only to some inhabitants of the site (the abarakku, the grand vizier and their staff; F.A.M. Wiggermann, personal communication), or were prepared centrally for common meals on special occasions only.225

Secondly, cooking pots made of metal could have been used for preparing the daily dishes. Metal pots would probably not have been left behind at the site, but taken away when the inhabitants left. This is illustrated by textual (Middle Assyrian, Freydank 1980: 112ff including a metal diqāru) as well as iconographic sources (Neo-Assyrian, figs. VI.33), in which metal cauldrons are part of the inventory taken away at deportation or at the sacking of a city. Pottery vessels are never mentioned in this context and were probably left behind. It is likewise possible that the imported cooking pots were deemed valuable enough to take along when people moved, while the locally produced pottery was left behind. In that case, only broken or damaged cooking pots would have become part of the archaeological record.

A third explanation may be that other pottery vessels were used as cooking pots as well, but that we did not recognize them as such. However, no other vessel group showed the characteristic combinations of shape, surface treatment, fabric and traces of soot that the group of cooking pots did.

Apart from the cooking of food, pottery vessels could also be used to process foodstuffs in other ways. In the Sabi Abyad texts there is evidence for beer brewing, oil pressing and the baking of bread (Wiggermann 2000: 190).

Beer brewing
Among the craftsmen mentioned in the texts of Sabi Abyad is a brewer (Ass. sirašû; Wiggermann 2000). A concentration in the northern part of the dunnu of texts dealing with the delivery of beer indicates that the office and part of the brewery were located in this area. The texts mention up to six brewers delivering large quantities of beer to the staff, but the frequency of delivery is unknown. Part of the deliveries came from other settlements (Akkermans and Wiggermann in press; F.A.M. Wiggermann, personal communication). Among the complete vessels, small and large bowls, a bowl with a spout and a handle, deep bowls with a base hole, large jars, pot stands and two “pilgrim bottles” were found. Beer could be stored longer than water, contained fewer bacteria due to the alcohol content, and was a nutritious drink for all members of the society (Curtis 2001: 210-219). The use of pottery vessels in brewing beer is attested in many cuneiform sources throughout Mesopotamian history (e.g. Powell 1994, Stol 1994), and also at Sabi Abyad the brewer would have used pottery containers to prepare this popular drink. The Sabi Abyad beer does not seem to have been sieved or strained, as is suggested by the find of several bronze beer straws (filters) that were used to keep the larger particles out while drinking.

Experiments in traditional beer brewing at Tell Bazi in Syria, using ancient vessels dating from the Late Bronze Age, have clarified the possible uses of large storage pots and deep bowls with base holes. The experiments took place in early summer. The large pots were identified as “beer vats”, while the pots and bowls with base holes could be identified as soaking and germinating vats. First grain was soaked and brought to germinate in a pot with a base hole, placed on a pot stand with a bowl under it. The base hole was closed with a plug, and a piece of cloth was put inside the pot over the hole. Water was added to the grain and the mixture was left to soak. Dirt and weed seeds would come floating and could be scooped from the top, which is why an open vessel shape is best. When the grain had soaked and germinated enough, the plug was drawn from the hole and the remaining water could drain through the cloth into the bowl below. This bowl was only necessary to keep the floor dry, as this water would not be used anymore. In Bazi the germination took place inside the mud-brick house in four days, at a room temperature of about 24°C. Then the pot and its contents were carried to the roof, where the green malt was spread on a mat to dry in the hot sun. By doing this the germination is stopped. After drying the malt was ground with a basalt grinding stone. The next step was to mix water and malt in a large beer vat that was fixed into the floor (for a cooling effect), to add some yeast and to let the beer stand for 36 hours. The low proportion of malt to water (ca. 1:8) means that with one large pot of prepared malt a lot of beer could be produced. The resulting beer was low in

225 Indeed, one huge bowl (fig. IV.58.f) was found in square M9, a building associated with the “kitchen” in square K9. Possibly communal meals were served to dunnu staff in this area (cf. also Akkermans and Wiggermann in press). Interestingly, a cook is not among the professions attested in the texts at Sabi Abyad until now (F.A.M. Wiggermann, personal communication).
alcohol, tasty and stable for more than two months afterwards. The presence of calcium oxalate (resulting from the mixing of grain and water and a clear indication for beer production) in the vessel walls was proved for the ancient Bazi vessels through chemical analysis (Zarnkow et al. 2006, A. Otto personal communciation). Although at Sabi Abyad the use of the base-hole pots as germination vats is not proved by chemical analyses, we may suggest in analogy with the Bazi experiments that at least some of them may have been used as such. Their capacities range between 11 and 18 litres for the smaller bowls to 97 and even 150 litres for the big pots (fig. VI.17, 18). The ready-made beer could have been stored in the large closed storage vats or in large jars, awaiting further distribution.

The correspondence of pots with base holes with the word nazzītu / namzītu, a fermenting vat used in beer production and known from texts, has already been suggested by Gates (1988: 66-68) for vessels found in Tell Hadidi. However, a namzītu is usually interpreted by Assyriologists as having been used to squeeze the mash and let the beer drip into a lower vessel placed under it (Stol 1994: 170-171, Curtis 2001: 217).226 From the experiments at Bazi it is clear that no squeezing is necessary, unless a filtered beer is being produced. The vessels with base holes from Sabi Abyad seem to be too big and heavy to place them on top of another vessel to collect liquid dripping from it, and this reconstruction is not favoured for Bazi either (A. Otto, personal communciation).

Another vessel mentioned in texts from Sabi Abyad and Tell Chuera and associated with beer is a tarību. It is unlikely that this otherwise rarely mentioned vessel is related to beer production, beer transport or storage, as it has to be delivered to another location together with the beer. Perhaps it was used in the consumption of beer, but its meaning is as yet unclear (Jakob 2003: 407, see also Appendix F). A stand called kannu was sometimes used under a beer vat, but this kind of stand was usually made of wood (Stol 1994: 170-171, Maul 1994: 361, 365). The large ceramic pot stand P93-177 was found at Sabi Abyad in connection with a large pot with a base hole, and could have been used together with it. Other vessels mentioned in texts related to beer production are a marsattu (a soaking vessel?) and a mašḫulu (strainer).

Other preparations of food
At Sabi Abyad oil was pressed from sesame, both for domestic use as well as for transport to the residence of Ilī-paḍā and to Aššur, as is clear from the texts (Wiggermann 2000: 192). Olives have not been attested so far. How the pressing of sesame for oil took place is not clear, and no obvious oil pressing installations have been found at the site. Perhaps oil pressing took place at one of the subsidiary settlements around Sabi Abyad. In any case, the resulting sesame oil could have been stored in pottery jars for distribution at Sabi Abyad and for transport to other sites. Curtis (2001: 232) suggests that jars with holes in the upper or lower body could have been used to separate olive oil from water during olive-oil production; perhaps, some of the pots with base holes or the large pot with a hole drilled in the lower vessel wall (fig. IV.67.f) were used for these purposes. The deep bowls with a spout and handles (fig. IV.60, 61.a-c) may also have been used to separate some material floating on top of a mixture, including oil, and to decant it into another vessel. Middle Assyrian vessel names associated with the production of oil are absent so far; words related to the storage of oil are kirru, kukkubu, kūtu, šappatu and tallu.

Although cooks are not mentioned in the texts, the baker (alalḫinu) Paya is (Wiggermann 2000: 190). His workshop was located at the southern end of the settlement, where an unusual number of tannur ovens and grinding stones was found. Besides, texts dealing with Paya and with bread and flour are concentrated in this area. The baker would probably not have used pottery vessels for the actual baking of bread (no bread moulds have been found). Nevertheless, a baker could have used vessels for (short or long-term) storage of grain, flour and dough, as well as for spices and condiments used for the baking of special breads. Interestingly, it is in this area of the site that a small carinated bowl filled with charred garlic was found. Vessel names associated with the storage of grain or flour in Middle Assyrian texts are hari‘u (a large storage pot for barley), kirru and qullī‘u (a large vessel and a bowl, both for flour).

226 Depictions of beer brewing in Egypt suggest that there the beer was squeezed through a basket into a vessel with a spout; see Faltings 1998.
Storage and transport

The proper storage of enough foodstuffs, seed corn and grain for rations was a central concern of the dunnu staff at Sabi Abyad. There are several different ways to store perishable goods, whether dry or liquid, including bulk storage in sacks, baskets or without a container in storage rooms or silos. Drying, roasting or smoking, and salting or pickling of meat, fruits and grain may have been common practice, too, for preserving foodstuffs (Curtis 2001, Bottéro 2004: 56-63). In this context, especially, the absence of mats, sacks, leather containers and baskets from the archaeological record is most disturbing: especially dry goods like grain, sesame, dried fruits and salted foodstuffs would have been most easily stored in baskets or bags. Large storage spaces especially built for bulk storage of grain have not been identified at the site of Sabi Abyad.227 Perhaps the yields of the harvest were not stored at the tell itself but elsewhere (Wiggermann 2000: 184). Dry storage of goods in smaller quantities must have been common practice in individual households all over the site. The most important of these dry goods was grain, received in rations at set intervals of time (although it is not known how often). A typical monthly ration would be 0.3 īmēru (= 30 qû) of grain for an adult male, 0.2 īmēru (= 20 qû) for a female and 0.1 īmēru (10 qû) for children, and people would produce some extra grain on their own fields (on average 0.13 īmēru per person monthly; Wiggermann 2000: 186-187). A small family of a husband, wife and three children would thus need 145 qû (or ca. 120 litres) of storage space in a month for grain or flour, but of course households may have been composed of more people (between 3 and 24, cf. Wiggermann 2000: 191). If not stored in bags or baskets, the grain could have been stored in four large jars or in one very large pot (see above for Middle Assyrian vessel names associated with the storage of grain products). Other dry goods needed to be stored as well, mostly again in baskets and bags, but perhaps sometimes in deep bowls or pots and jars as well.

Liquids could only be stored in leather sacks or in pottery or metal vessels. The storage of drinking water for long periods of time seems to have been unnecessary, as Sabi Abyad is located close enough to water sources to enable the daily fetching of fresh water. Possibly only the amount of water needed for a day was fetched and stored short term in the house. In analogy with the modern villagers of Northern Syria, this could have been done using the deep open bowls and pots (types 141, 142, 221, 222). Nevertheless, several sherds of very large storage pots (figs. F.6, F.7) have the cuneiform sign for water incised at the shoulder of the vessel, done before the vessel was fired. One of these vessels is coated with bitumen on the inside, making the vessel extra watertight. Possibly these vats were used for long-term storage of drinking water or water used for other tasks (washing, brewing, etc.). An important liquid requiring storage at home is beer. As discussed above and contrary to the situation in Tell Bazi (Zarnkow et al. 2006), it is not likely at Sabi Abyad that every household produced its own beer. Rather, the brewer would provide the inhabitants with the drink. The brewer kept daily records of his production; two small texts each mention the delivery of 4 sūtu (= 40 qû, ca. 33 l.) of beer for the meal of Ilu-padâ (Wiggermann 2000: 175), possibly delivered in a large jar. Ordinary people would store beer in large or smaller jars at home; it is not known how much beer an individual would consume on average. Vessel names related to the storage of beer in Middle Assyrian texts include kirru (a large vessel for beer), kukubby (a small jar or drinking flask), and laḫannu (a jar that may be closed with a stopper).

The transport of goods from Sabi Abyad to other sites took place especially in the context of sending revenues and (ritual) contributions and taxes to the capital of Aššur, as well as in the context of the provisions needed in Ilu-padâ’s residence. Transported goods include clothes, bedlinen, grain, sesame, cress and spice plants, as well as oil and honey (Wiggermann 2000: 173). Whereas for the dry commodities bags and baskets would have made light and strong containers, honey and oil could only be transported in leather skins or in pottery vessels, perhaps the medium-sized or large jars. Goods imported from elsewhere include honey; one contract mentioned the delivery of 0.25 īmēru (25 qû, ca. 21 l.) of honey (Wiggermann 2000: 197). Jars like the so-called pilgrim flasks, themselves not produced at the site, could have served as packaging material for imported liquids like honey or wine. Although wine has not been attested in the texts at Sabi Abyad, similar globular jars were identified as wine jars at other sites (cf. Gates 1988: 68-73; even

227 A small square space attached to the central tower in squares J9-K9 could be identified as a (grain) storage space, but its capacity of a maximum of 50 m³ is not enough for the total production at the site. In addition, the northern courtyard of the residence was used for grain storage towards the end of level 5 (see Chapter III).
the capacity of those wine jars (ca. 10 l.) is similar to our “pilgrim flasks” (ca. 7.5 l.). Chemical analysis of residues in the vessel walls may prove or disprove this suggestion.

Other needs for ceramics

Of the other craftsmen attested in the texts from Sabi Abyad, several could have used pottery vessels in their craft. They include perfume makers and “servants of the Temple of Aššur” (Wiggermann 2000). The Sabi Abyad texts give us no clues as to the kind of pottery vessels a perfume maker may have used; however, texts from Aššur present a clearer picture. For the production of 20 qū of oil, first aromatic plants are cooked in water in a diqārū vessel, already identified above as a cooking pot. Then the mixture is put in a ḫariʿu, a large vessel, other ingredients are added and the mixture is left to stand overnight. In the morning the mixture is strained into a hersu-vessel, and from this vessel it is again decanted into another hersu-vessel and the residue is removed. Only then the oil is added to the now perfumed water in the cooking pot, and again heated on fire. It will be kept cooking or standing for two to three days. The perfumed oil is then strained through a cloth into a šapputu jar. An aganna-vessel seems to have been used as well (Jakob 2003: 477-486). From this recipe it becomes clear that all mentioned vessels most probably had a capacity over 20 qū (ca. 17 litres); diqārū and ḫariʿu are possibly larger.

The “servants of the Temple of Aššur” probably also made use of ceramic vessels in their rituals. The only “ritual” use of pottery attested through the archaeological context is the use of small bowls as gifts in burials. Furthermore, the vessels decorated with elaborate appliqué shapes of humans and animals (fig. IV.64.a-b) may have been used in a special, perhaps ritual, context if they did not just serve as a decoration. However, in cuneiform texts from the Middle Assyrian period more vessels occur in a ritual context. Of the vessel names listed above, these are the aganna, the ḫariʿu, the kallu-vessel (for scattering flour, salt, water and oil), the kannu stand and the nazzītu beer vat, the kāsu cup and the kirru vessel (for libations of liquids into the kirru), the labanna vessel (for libations and to hold medicines), the mākaltu and maqqū bowls (for offerings and libations of beer, dates, figs and oil), the nignakku and šebeit incense burners, the pursū (a ritual bowl), the sītu, and the šapputu jar. Text Sabi Abyad T98-131, listing vessels for a ritual or ceremony (Appendix F), includes the ḫuruppu, makkusu, ēkkabu, ḫapaltu and saḫḫarru vessels as well. All of these vessels except for the pursūtu, maqqū, ḫapaltu, makkusu and šebeit are attested in other more profane contexts as well. This suggests that for rituals not many special pottery vessels were produced. Rather, the vessels merely seem to have the role of container for the materials to be offered to the gods. Or, if vessels were specifically made for ritual purposes, they carried names similar to their day-to-day counterparts. In rituals the small bowls and cups (like kāsu, maqqū) are used to pour libations into a larger vat (like sītu, kirru). Platters or bowls (mākaltu) are used for offerings of bread or other foodstuffs.

Vessels in iconography

The second contemporary source of information on the use of ceramics is iconography. In the Middle Assyrian period the number of preserved iconographic material on reliefs, wall paintings and objects is extremely limited. The main source of iconographic information are the numerous cylinder seals and their impressions on tablets and sealings. However, the subject matter on cylinder seals of the Middle Assyrian period mostly deals with religious, mythical or natural scenes, and not with scenes from daily life (unlike seals from the third millennium BC on which all kinds of crafts and subsistence activities are depicted, cf. Collon 1987). Indeed, the situation in Mesopotamia is in general very different from, for example, Egypt, where ample illustration of the use of pottery vessels is available from a number of sources, including wall paintings and miniature models (cf. Faltings 1998 and also Nicholson and Shaw 2000 for a good overview of iconographic evidence for the use of ceramic vessels in food production in Egypt). Apart from the limitations of the sources, a second important issue restricts the interpretation of iconographic material in the context of this study. Even less than in cuneiform texts, the images show what material the vessels are made of. All vessels discussed in this paragraph could be pottery, but metal and stone vessels may have been depicted as well. In some contexts it is even more likely that vessels were luxury metal or stone vessels rather than the
common pottery containers. The shapes of the depicted vessels rarely give any clues as to the material (in the absence of spouts, intricately wrought handles, cannelures, applications etc.). We will therefore speak of “vessels” and not of “ceramics”. The present paragraph is an attempt to collect all existing information on vessel use from the Middle Assyrian period. Several vessels are depicted on the so-called White Obelisk, a monument of debated dating but possibly belonging to the 11th century BC (cf. Börker-Klähn 1982, including references to relevant literature). Where illustrative, depictions of the Neo-Assyrian period will be discussed as well, since the iconographic material from the Iron Age is available in much larger numbers, more varied and more detailed in its execution. Moreover, there is a strong cultural continuity in texts (vocabulary and style), iconography and material culture between the Middle Assyrian and Neo-Assyrian period, even to such an extent that the division between the two is still a matter of debate (e.g. Postgate 1997).

In the absence of scenes depicting craft activities, the illustration of vessels in the Middle Assyrian period is limited to banquet scenes and religious scenes of offerings or libations. As can be expected, vessels are absent from scenes of nature, contests with mythical beasts, or combat. Indeed, even in the iconography-rich Neo-Assyrian period (ceramic) vessels are rarely depicted in the many illustrations of soldiers carrying away booty or bringing tribute: materials are packed in bags, sacks and boxes for transport. This is not true for metal containers, and bowls on tall conical stands as well as large metal cauldrons are shown to be taken as booty after the sacking of a city (fig. VI.33). This means that in this paragraph we are looking mainly at the use of vessels in a special context of religious, ritual, or royal nature. The range of depicted vessels is restricted as well. Forms include small cups and bowls, large deep bowls on a foot or stand, small jars, large jars with pointed bases on a stand, and conical stands for incense burners (cf. fig. VI.44).

When large jars are depicted on Middle Assyrian seals, they are always set in a wooden stand or rack (fig. VI.19, 21, 28). The stands seem to be rather high, so that a person does not have to bend down to lift the jar. Remarkably, all jars are rather slender and have clear necks and pointed bases. Middle Assyrian pottery jars, as we have seen, rarely have clear necks and if so (in type 315, 318 for example), they do not have pointed bases. In contrast, tall and slender jars with necks become more popular in the Early Iron Age (cf. Hausleiter and Reiche 1999). This can also be seen in the depictions of jars in Neo-Assyrian art (figs. VI.35, 38, 39, 42, 43). Of course, the necked jars depicted on Middle Assyrian seals could have been meant to indicate metal jars. However, if pottery jars were depicted, their shape would suggest a date very late in the Middle Assyrian period (not considering other stylistic or archaeological arguments). Pottery jar stands similar to the ones found at Sabi Abyad do not seem to have been depicted on seals.

Small jars are also present on seals. They, too, seem to have a clear neck, although these shapes are so small that they are not detailed enough to draw conclusions. Middle Assyrian small jars type 311 could have been meant as well. Small jars are set on the floor or on the table (fig. VI.23, 24b), but more often they are carried in the hands as in a seal impression and a libation scene on the White Obelisk (fig. VI.27, 30, 31 no. 2, 32). Perhaps they can be identified as the labannu and possibly the šappatu jar. In Neo-Assyrian art small jars are offered to another person, too, presumably for drinking (fig. VI.34, 38). This supports the possible function of small jars as (beer?) drinking jars (see above).

Deep bowls on Middle Assyrian seals are in shape comparable to the deep straight-sided pottery bowls found at Sabi Abyad. However, the pottery shapes never have a tall conical foot as the bowls on the seals do (fig. VI.20, 24). Again, perhaps the depicted bowls were thought of as metal bowls, with an attached metal foot or stand. Or, if pottery bowls are depicted, a short conical stand was used. These stands could be similar to the pottery jar stands from Sabi Abyad. Deep bowls of this shape are never depicted together with large necked jars, and in the pottery corpus of the Neo-Assyrian period this shape seems to have become much less popular as well (cf. Hausleiter and Reiche 1999). The presence of these deep bowls might be an indication for an earlier date of the seals. The large pot on a stand depicted on the White Obelisk, in front of the king offering to the temple, seems to have a clear outward-bent rim (but cf. the different line drawings in figs. VI.30, 31 and 32). Perhaps a metal vessel is meant. In any case, this shape does not occur in the Middle Assyrian pottery corpus. It is comparable, however, to the metal cauldrons carried away as booty by Neo-Assyrian soldiers (fig. VI.33) and used in Neo-Assyrian camps for cooking (figs. VI.39). The deep bowls seem to have the function of receiving the libation poured in front of the god and the table with offerings. Perhaps they can be identified with the agannu, the sītu or the kirru mentioned in religious texts that mention pottery vessels (see above).
Small cups, goblets and bowls are shown on Middle Assyrian seals and on the White Obelisk in the hands of a person, lifting the cup to the mouth for drinking (fig. VI.26, 29 (from Sabi Abyad), VI.31 no. 4) or used to pour libations (fig. VI.24). Perhaps these are the kallu, kāsu, maqqi and pursītu mentioned in religious texts for pouring libations (see above). The depictions are too tiny to draw any conclusions on the exact shape of the cups and bowls. However, we may suggest that not only goblets were used for drinking but small bowls as well, as already suggested above for the pottery bowls from Sabi Abyad. Sometimes cups or bowls were perhaps put on a table in offering and banquet scenes (fig. VI.20, 22, 25).

The conical stands or incense burners (nignakku) are mostly believed to have been made of metal (cf. figs. VI.33, 35) for Neo-Assyrian reliefs showing metal examples). However, the shape is included here because of the find at Sabi Abyad of a tall conical pottery stand (fig. VI.16) with an inner ledge, suitable for holding another vessel (a bowl?). Perhaps, in analogy with the conical shape of the incense burners on seals, this could be a pottery example of such an item. However, the incense burners in iconography are all much taller than the pottery example (cf. fig. VI.44), and the identification must remain tentative. On top of the incense burners a small bowl seems to have been placed to contain the incense or fire.

The value of iconography for drawing conclusions about vessel function in the Middle Assyrian period is limited. The scenes on seals and other media show that vessels (whether made of pottery or other materials) were used during religious ritual and during banquets. The use of vessels for eating and drinking was of course no new insight. The iconographic material is not detailed enough to draw conclusions about the specific shape of the vessels, and hardly any comparable finds of metal or stone vessels are available for the period.

VI.5 Conclusions

At the end of this chapter we still do not know much about the enigmatic “tariḫu”-vessels that Mudammeq-Aššur needed for his dinner with the Suteans. However, by combining information contained in the pottery vessels themselves, the archaeological context and the information from texts and iconography, a start has been made with sketching a picture of how pottery vessels were used at Sabi Abyad. An understanding of the role of pottery containers is not only indispensable for the understanding of pottery as a find category at the site. It is also a prerequisite for understanding and explaining the organization of the production of pottery. Any insight into the ways people used their pots contributes to the understanding of the demand for pottery by the consumers. In Chapter V we have seen that the demand for vessels is an integral part of the pottery production organization. As was already expected in the preceding chapters, most of the pottery produced at the site was of a practical, day-to-day nature. The vessels that were produced in the largest quantities almost all seem to have had multiple functions and uses, and functional specialization of a vessel is rare. Although some clearly special shapes were found, most of them were most probably not produced at the site.

The results and conclusions from this chapter can be used as a starting point for a detailed functional and spatial analysis of the settlement at Sabi Abyad. A detailed assessment of the archaeological contexts might also yield more specific clues as to the use of certain vessels. A better insight into the use of pottery containers could also be reached through a systematic programme of chemical analysis of residues in or on the vessel walls. Such an analysis would ideally include the study of the relations between pottery containers and other containers and tools, and between containers and the wider cultural context.
Chapter VI: Function and Use