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Morphological analysis of first millenium thin walled pottery from southern Africa

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CHAPTER 3

METHODOLOGY

Vessel shape, size, surface properties, thickness of the sherds and decoration are the main attributes that are discussed in this chapter. The diameter readings were recorded on rim sherds using the template originally made by C. Garth Sampson (Fig. 3.1) To illustrate the shape, profiles of rim sherds were drawn and the surface treatment and temper were also noted. The thickness was measured from the sherds and also from the rim drawings. The location technique and the pattern of decorations were noted.

The samples used in this study were from Namibia, Botswana, Zimbabwe, Limpopo and Cape Provinces, as well as some key Kenyan sites. First, I outline the geographic location of each site. Dating of the first millennium sites has been a challenge. I therefore discuss the latest, most acceptable dates for all these sites. The samples studied are curated at different museums and repositories and some samples are still under research at various universities. The sample size for first millennium thin walled pottery has been a concern to past researchers and I therefore discuss my sample sizes and the challenges concerning samples from different sites.

3.1 Site Location &Collection repository

3.1.1 South and west coast of southern Africa

The earliest sites covered in the south and the west coasts of southern Africa are as follows:

- Kasteelberg A (KBA): C14 dates range from 100 – 1860 BP (Smith 1987; Sealy & Yates 1994). Main occupation seems to be in the second half of the first millennium AD (Sadr *et al* 2003).
- Kasteelberg B (KBB): 190 – 1310 BP (Smith 1987). Lower part is mainly from second half of first millennium.
- Kasteelberg D east (KBDe): C14 dates on marine shell range from 1550 – 1750 BP (Sadr, pers. comm.). When corrected for reservoir effect and calibrated, they fall in the second half of the first millennium AD.
- Die Kelders: C14 dates range from 1465 – 2620 BP (Schweitzer 1979). The weighted mean of five dates from layer 2 is 1576 BP, which calibrates to the mid-first millennium AD (Sadr & Sampson 2006: table 1). Layer 12 provides a weighted mean date of 1978 BP from three coeval C14 dates, which calibrates to the first two centuries AD (Sadr & Sampson 2006: table 1).

Kasteelberg A (KBA):

KBA is an open-air shell midden on top of the Kasteelberg hill. Ceramics from this site were found throughout the shell-bearing sequence (Smith 1987). Andrew Smith conducted initial excavations at the site in 1982 and again in 1991 in arbitrary levels excavating an 18m long and a meter wide trench. Some early dates from these excavations were 1860 ±60 BP and 1740 ±40 BP. These dates were later questioned by L. Webley's excavations, which on the contrary indicated dates of 100 ±50 BP, 140 ±50 BP and 220 ±50 BP. In 1987, excavations conducted by Andrew Smith and C. Poggenpoel yielded dates of 730 ±40 BP and 970 ±50 BP.

Kasteelberg B (KBB):

KBB is also an open-air shell midden site with radiocarbon dates pointing to 1300-800 BP as the major occupation period and an intrusive late occupation at the top dating 200 BP. From the main excavations at KBB and KBA over 30 000 sherds were recorded (Sadr & Smith 1991).

A twenty square meter area was excavated at KBB in addition to an earlier 6 sqm. These indicated that the entire KBB sequence is pottery bearing. Sadr and Smith (1991) divided the occupation at KBB into two different periods that is the early and the late period. The interface of the two periods is unclear and Sadr (1998) argued that we cannot tell whether the transition was rapid or took over 200 years. Based on the fact that layer 12 at the interface had a mix of both early and late materials, layers 13-16 were then grouped as the earliest occupation at the site and these are the focus for this research. With the available evidence it is impossible to determine how quickly the change took place from early KBB to late KBB. If the change occurred gradually it could support the idea of an *in situ* cultural transformation thus refuting the idea that migration was responsible for the new lugged ceramic types, which appear here in the second millennium (Sadr 1998).

The repository for the pottery from Kasteelberg is the University of Cape Town Department of Archaeology. A study on rims and decorated sherds from Kasteelberg (KBA and KBB) has been published by Sadr & Smith (1991). Some of the data from previous studies on the site have already been published (Smith 1987; Sadr & Smith

1991; Sadr 1998). A comparison of the published data with the actual drawings of the sherds was conducted during a visit to the University of Cape Town. At the same time old reports from previous unpublished excavations were copied from Andrew Smith's archives and are also included in this research.

Kasteelberg D east (KBDe):

In 1999 six square meters were excavated at Kasteelberg D east with radiocarbon dates suggesting an occupation spanning the 8th to 11th centuries AD (Sadr *et al* 2003). A total of 275 sherds have been recovered from this site. The sample size of diagnostic sherds was far too small to allow the analysis by separate layers therefore all the layers were lumped together. Even after lumping the sample, the sample size remained extremely small, thus its reliability was treated with caution throughout this research.

Die Kelders:

On the eastern shore of Walker Bay is an archaeological site known as Die Kelders, which yielded significant material for this research. Die Kelders is located at the Gansbaai coast. A number of caves at Die Kelders yielded remains of prehistoric occupation and the most important of these is the Klipgat cave complex (Schweitzer 1979). The main focus for this research is Die Kelders 1 (DK1) that is part of the complex.

Excavations at Die Kelders (DK1) by Schweitzer (1979) represented the first phase in an investigation of the ecology of the indigenous populations of the southern Cape. The

earliest ceramics here were found in level 12 dating to around 1970 BP (Sadr & Sampson 2006: table 1). Around 85% of the potsherds from this site came out of this layer. It is the sample from this layer, which is the main focus for this research. The repository for the pottery excavated from this site is the Iziko museum in Cape Town, and I examined the collection in the year 2005.

3.1.2 Northern Cape

Based on the sample size limitation and the limited research on early ceramic sites in this area, I only had a very small sample from the following sites. The chronology of the earliest sites studied is as follows:

- Blinkklipkop: Layer 5P: 1160±50 B.P (Pta-2840); Layer 5s/t: 1150±40 B.P (Pta-2835) (Humphreys & Thackeray 1983).
- Little Witkrans: 1830±50B.P (Lab no. Pta 3480); 1860±60B.P (Lab no. Pta 4324) (Beaumont et al 1995).

Blinkklipkop:

This site is also known as Gatkoppies and is a prehistoric specularite mine located on the hillside of an ironstone outcrop about 5km north-east of Postmasburg on a farm known as Doornfontein (Humphreys & Thackeray 1983). This particular site has been of interest to archaeologists and historians because many early travelers visited it in the nineteenth century including Somerville, Borcherds, Campbell, Lichtenstein, Burchell and Backhouse who wrote very detailed travelogues about the site (Humphreys & Thackeray 1983).

Excavations at the site were conducted by natural stratigraphy except for layer 5 where natural stratigraphic divisions were not clear. This layer was thus excavated in arbitrary 100mm spits following the slope of the deposit. It was during the 1980 excavations that A.I. Thackeray, J.F. Thackeray and P. Beaumont indicated that archaeologically the site provided a minimum date for the appearance of domestic animals and pottery in the Northern Cape. Interestingly pottery from this site has been found in most layers at the site. Radiocarbon dates from 5p and 5s/t, which are also pottery bearing layers, yielded dates of around 1160±50 B.P for layer 5p and 1150±40 B.P for layer 5s/t.

Faunal evidence showed sheep remains throughout the deposit and provided evidence for the presence of domestic stock in the Kuruman hills by at least 1200 BP. According to Humphery & Thackeray (1983) the importance of Blinkklipkop in the context of prehistory is to supplement the Holocene sequence from Wonderwerk cave by providing evidence that domestication and pottery were present in the area by at least 1200 B.P.

Little Witkrans (Klein Witkrans):

The other site from the Kimberley area in the Northern Cape Province is Little Witkrans, also known as Klein Witkrans. This site is situated under a tufa cliff on the Ghaap escarpment about 5km south of the town of Buxton (Humphreys & Thackeray 1983). The main interest is the possibility that pottery from this site might be 3000 years old, thus providing a possible argument for the presence of pottery in the Northern Cape about 1000 years before it is first known in the southern Cape. This idea has been challenged by the fact that only three radio-carbon dates are available from the site and much of the

deposit is roughly dated by extrapolation of these dates. Because of this 'guess work' the cultural material from Little Witkrans can only be dated in general terms. The main reason Little Witkrans was included as one of the Northern Cape sites is the fact that it indicated the earliest emergence of thin walled sherds along the Harts River (Beaumont et al 1995). The dates from this site are questionable since Sadr and Sampson (2006) pointed out that potsherds could have migrated down profile to levels with improbably old charcoal dates.

Excavations at this site were conducted by members of the University of California South African expedition under the direction of F.E. Peabody in the late 1940's and by P. Beaumont in 1978. A very small pottery sample was recovered at the site, only 12 body sherds and 3 rims (Humphreys & Thackeray 1983). Charcoal associated with this pottery yielded dates of 1490 ± 40 BP and 3000 BP. The context of their recovery is spit 5-10cm dated to 1490 ±40 BP, whereas the date from 25-30cm is as old as 3000 B.P. The repository for the collection from these sites is the McGregor Museum in Kimberley. A visit to the museum was undertaken in March 2005 to collect all necessary data for this research.

3.1.3 Limpopo Province

It has been argued that the early presence of the Khoe in the Limpopo valley may be supported by paintings of fat-tailed sheep around Makgabeng region (Eastwood & Fish 1996). Linguists indicated that the presence of the Khoe in the Limpopo valley might be inferred from supposed loan words in some south-eastern Bantu languages (Ehret 1982).

Olieboomspoort:

Olieboomspoort is a rock shelter located in the Waterberg. The site is located in the drainage basin of the Moloko River. A team from the University of South Africa (UNISA) excavated the site with Marie Van der Ryst as the principal researcher. The dates for the uppermost layers at Olieboomspoort show that LSA hunter-gatherers occupied the shelter during the last two thousand years (http://www.unisa.ac.za).

Excavations at Olieboomspoort uncovered 50 decorated Bambata sherds representing about 31 vessels. Also noted at the site are spouts. Interestingly, the vessels with spouts exhibited evidence of ochre on the outside. The presence of ochre can be an indication that these vessels were used as containers for pigments in the production of paintings either for rock art or for other purposes. During this research the sample was still under study by Marie Van der Ryst's student, therefore I did not include the entire sample from the site, but concentrated on the Bambata sherds only. All the information used for this research pertaining to the site was collected during a visit to UNISA in the year 2005.

3.1.4 Botswana

Toteng I & III are located at the confluence of the Nchabe and Kunyere rivers. Dates for Toteng I were obtained from charcoal and livestock bones associated with Bambata pottery (Campbell 1992; Robbins *et al* 2005). The date range from Toteng I is 1820-2070 BP with a weighted mean of 1990 (Sadr & Sampson 2006: table 1). Toteng III yielded a weighted mean date of 1686 BP (Sadr & Sampson 2006: table 1).

Toteng I & III:

Alec Campbell first excavated these sites in 1991, during an archaeological impact study for the Maun reservoir project planned by the Botswana Department of Water Affairs. The findings from the survey, including the ceramic data from the two sites, were published by Campbell (1992). His research at these sites indicated disturbance to the stratigraphy of Toteng III by quarrying and erosion (Campbell 1992). From Campbell's (1992) description of Toteng III, the site sloped from north-east to south-west and was severely eroded and damaged by a road, pits, the quarry and both wind and rainfall runoff. Noted from the surface over a considerable area were bones and undecorated sherds scattered all over. This therefore led to the mixing of the latest and the earliest sherds on the surface and part of the sub-surface. As a result, the stratigraphic distribution of different pottery types (Bambata, Khoe and historic) was not clear (Huffman 1994). However, Bambata pottery was generally stratified under the Khoe and historic types.

A debate around Bambata pottery is whether the pots were made and used by Iron Age people or Late Stone age people. Huffman (1994) suggested that Toteng I in fact represents an Early Iron village. In his 2005 publication, Huffman has shifted away from the idea of defining Toteng I & III, as Iron Age villages, but continues to consider that Bambata ware was made by Iron Age villagers and brought to Toteng from elsewhere.

Toteng I yielded faunal remains, stone tools and Bambata ware in addition to other kinds of pottery, such as the historic material. The context of most Bambata sherds was in a concentrated ashy deposit around 50cm in thickness, which has been interpreted as a

midden (Campbell 1992; Huffman 1994). Early excavations at Toteng I yielded two radio-carbon dates of 1820 and 1990 BP. The samples used for dating were charcoal from within a layer that had Bambata pottery and domestic animal remains. More recent AMS dates on bones of domestic animals push the age of the first livestock here back to 2070 BP (Robbins *et al* 2005). Toteng III, which is smaller than Toteng I, yielded radio-carbon dates on charcoal of 1600 and 1810 BP (Campbell 1992). The quantity of Bambata pottery and faunal remains were smaller than at Toteng I. Ceramic information from the two sites (Toteng I & III) has been published but rim diameters were not recorded in the publication so I visited the Botswana National Museum to record this information.

3.1.5 Namibia

It has been argued that during the introduction of domesticated animals to southern Africa, the northern part of Namibia played an important role (Smith 1992). Geduld, Oruwanje and Falls Rock Shelter are the main sites in Namibia and the chronology of the sites is as follows:

- Oruwanje: range of C14 dates from 1900 – 3100 BP (Albrecht *et al* 2001). Most probable weighted mean date for ceramics is 1911 BP (Sadr & Sampson 2006: table 1).
- Geduld: range of C14 dates from 1790 – 2300 BP (Smith & Jacobson 1995). Most probable weighted mean date of ceramic bearing layers is about 1900 BP (Sadr & Sampson 2006: table 1).
- Falls Rock Shelter: range of C14 dates from 1880 – 2100 BP (Kinahan 1991), with a weighted mean date of about 2000 BP (Sadr & Sampson 2006: table 1).

Identifiable remains of domesticates from Geduld and Falls Rock are rare and this raises important questions as to what extent can these sites be defined as pastoralist or hunter-gatherer sites.

Oruwanje:

Oruwanje 95/1 rock shelter is located approximately 10km west of the Kaoko-Otavi village in northern Namibia, in the Opuwo district (Albrecht *et al* 2001). R. Kuper excavated the first trench at this site in 1995 and M. Albrecht & R. Kuper excavated the second trench in 1996. The site yielded 134 potsherds with the majority of the sherds concentrated in the upper and middle part of the sequence.

Analysis of trench II materials indicated that sherds from lower layers might be intrusive and the date of 3100 BP itself is also questionable (Albrecht *et al* 2001). The samples from these lower layers are not included in this research. Only sherds from level 9 and 10 were used. Oruwanje excavations revealed the appearance of pottery and domesticated animals at least by 1900-3100 BP. The weighted mean dates are 1911, 2228 and 3100 B.P (Sadr & Sampson 2006). The youngest mean date is perfectly acceptable as its constituent dates are from the upper sediment unit and are clearly associated with the ceramics.

Geduld:

Geduld is located above the north bank of the Ugab River south west of Outjo, approximately 300km south-east of Oruwanje (Kinahan 1995; Smith & Jacobson 1995; Albrecht *et al* 2001). The main excavations at the site took place between 1978 and 1986 and L. Jacobson conducted all those excavations. Stratigraphic levels at Geduld indicated no mixing up of layers, this was confirmed by the radiocarbon dates from successive levels which were in sequential order (Smith *et al* 1996). The sample used in this research was uncovered during excavations by L. Jacobson in the early 1980s, when eight square meters were excavated to a maximum depth of 1 metre, yielding an archaeological sequence dating from 2300 ±50 BP onwards (Smith & Jacobson 1995).

The sample used from Geduld is from level 7; square C6, excavated by natural stratigraphic levels. The radiocarbon date from layer 7 yielded dates of around 1980 ±50BP and level 8 has a similar date of 1970 ±40 BP (Smith & Jacobson 1995). The ceramic layers at this site have a weighted mean date of 1909 BP.

Falls Rock shelter:

This site is situated in the Hungorob ravine of the Brandberg and sheds new light on the migration debate. Excavations from the site yielded evidence that the first pottery appeared in the area between 1800 and 2100 years ago (Kinahan 1995). The dates from level 5, 6 and 8 yielded a weighted mean of 2007 ±29 BP (Sadr & Sampson 2006). The site itself contained a well-stratified deposit with a microlithic stone-tool assemblage and associated faunal remains (Kinahan 1995). Analyzing material from Falls Rock, Kinahan

(1991) argued that pottery in Namibia was present for more than 1000 years before domestic animals. In terms of the rock art, Falls Rock and an associated site known as Snake Rock are both richly painted. Depicted on the Snake Rock paintings are shaman figures which according to Kinahan (1991) seem to be from the final episode in the painting tradition just prior to the abandonment of the site within the last 500 years. This was then followed by the introduction of domestic stock and probably sheep.

A visit to the National Cultural Museum in Windhoek, which is the repository for all the ceramic collections from these sites, was arranged so as to collect all the data of interest for this research.

3.1.6 Zimbabwe

One of the ideas concerning the Khoe migration is that it might have started in southwestern Zimbabwe following contacts between hunter-gatherers and Early Iron Age immigrants (Walker 1983). So far, no definite pastoral sites have been located in Zimbabwe, but it is argued that Bambata Cave might provide evidence of the contact between the hunter gatherers and Early Iron Age farmers. Bambata pottery was first discovered in 1918 at Bambata Cave in Matopo hills near Bulawayo, in association with Later Stone Age material (Arnold & Jones 1919).

Archaeologists have not yet resolved the role of Bambata pottery in the spread of pastoralism and mixed farming. More information about Bambata pottery has accumulated over the years, but still its typological relationship with other pottery

traditions of southern Africa in general and Zimbabwe in particular has not been clearly defined. The dates for the sites under study are as follows:

- Bambata Cave: a single date on charcoal 2140±60 BP (Pta-3072; Walker 1983).
- Tshangula: a single date on charcoal 2150±100 BP (SR-75; Walker 1983).

Bambata Cave:

Bambata Cave, located in the north-western Matopo hills, is the focal point in Zimbabwe for this study. The site is situated near the summit of a large, bare granite hill (Walker 1983, 1995). It is well known for its distinctive style of pottery known as Bambata, first recovered in 1918 by Arnold and Jones (1919). It was in the 1930s excavations by Jones that the origins and the associations around this pottery were investigated. The sample used in the present study is from the 1980 excavations by Walker, which yielded Bambata pottery and an LSA assemblage concentrated in unit 3 (Walker 1983). The date for the pottery from this layer is around 2140 BP. The date is accepted on typological grounds, but it is problematic because an older date comes from a layer above the Bambata lenses (Vogel *et al*. 1986).

In 1963 Robinson published a paper shedding light on Bambata ware, indicating its position in then Rhodesian Iron Age in the light of recent evidence. That indeed formed the basis for more work by researchers like Walker who in 1983 published a paper on the uncertainties of a fascinating but poorly understood period of southern African prehistory. Past researches from the site have been well published in the above-

mentioned papers but none of them focused on the morphological variability of Bambata pots. A visit to the National Museums and Monuments in Harare was therefore arranged so as to collect the necessary morphological data.

Tshangula:

This is another site in Zimbabwe that has the potential of providing information on the Khoe migration debate. The date from Tshangula is problematic as it indicates disturbance of the site (Sheppard & Swart 1966). However, the date of 2150 ±100 BP from layer 1, which is associated with Bambata pottery, is close to the Bambata Cave date.

3.1.7 Kenya

One of the most viable models, in ecological terms, for the spread of domestic animals is the one connecting East Africa with southern Africa (Smith 1992: Fig. 2.1). Linguists proposed a connection between Khoe words and the central Sudanic languages (Ehret 1973). Furthermore, parallels have been established also with the eastern Sahelian language, which provides another link with East Africa (Ehret 1998).

The Kenyan assemblage that I looked at in this research was for comparative purposes only. The premise of the comparison is that if indeed there was a migration to the south originating from East Africa, there must be stylistic similarities visible in their ceramics from the right period. The samples used come from the following dated sites:

- Hyrax Hill: one date of 3,000BC (Sutton 2000).

- Ngamuriak: one date of 2135±140 BP (GX-8533); (Marshall 1990)

Hyrax Hill:

Located on the eastern edge of Nakuru town, right by the Nairobi road, is Hyrax Hill, one of the important archaeological sites in this part of Africa. The site is named so because of the large numbers of these small animals that populate the clefts and crevices of the rocks (Leakey 1945). It was in 1926 when L. Leakey noticed signs of occupation at the base of the hill. In 1937 and 1938 systematic excavations were conducted by M. Leakey, which then revealed three separate periods of activities (Sutton 2000).

Hyrax Hill North East village or Site II refers to a group of thirteen pit dwellings. These are a series of shallow circular depressions varying from 40 to 90 feet in diameter (Leakey 1945). Unfortunately, at this stage the dating of this Neolithic occupation remains uncertain. The characteristic features of the North-East village pottery are spouts, hence it is the focus for this research (Leakey 1945). Approximately 16 vessels can be distinguished among the 1300 sherds recovered from two pits and midden A.

Ngamuriak:

This site is located in the Loita-Mara area of southwestern Kenya, about 3 km east of Lemek village (Robertshaw 1990). The actual locality of the site is at the western edge of a large area of generally open plain. First excavations at this site took place around 1981 and those were aimed at establishing the date and character of the Elmenteitan settlement and subsistence within the Lemek valley (Robertshaw 1990). This site is a single

occupation horizon of 8000 square meters (Smith 2005). Excavations at the site by Robertshaw in 1990 yielded small spouted pots with dates ranging between 2350 and 1720 BP. The radio-carbon dates for this site were obtained from charcoal samples recovered from different locations at the site. According to Marshall (1990) the occupants of the site were pastoral people with large herds of cattle and sheep.

From the above it is apparent that the locations of the chosen sites are different, with some as rock shelters, caves or open sites. Associated with the first millennium thin walled pottery from these sites are Late Stone Age materials. Many dates for early ceramics from first millennium AD sites are contested. Sadr and Sampson (2006) point out a few reasons, such as early ceramics coming from sites and levels that have several widely separated dates, some indicate sherd movement down-profile to older levels and in other cases the association between dates and ceramics is questionable.

From all the sites covered in this study, each yielded different quantities of sherds and most samples are small. The small sample size was not treated as a limitation to conducting this study. Limited sample size is actually an indication of a number of factors such as different cultural practices where pottery had substitutes; broken pieces not being thrown away but used for other purposes; and the thin walls of the vessels resulting in very small fragmented pieces left behind once the pots broke. At this stage I will not discuss the sample sizes further but will focus on the attributes of focus in the samples. These attributes were chosen to answer my research question. The final section will address the statistical analysis used in drawing the conclusions.

3.2 Attributes of focus

I have found it necessary to examine the material from different angles. The chosen attributes are as follows:

- Vessel shape: morphological details such as rim shape, spouts and base.
- Vessel size: rim diameter
- Surface properties: surface treatment
- Thickness: sherd thickness
- Decoration: location, technique

I started by classifying vessel rims as either unrestricted or restricted. In an unrestricted vessel, no part of the body is wider than the orifice and the maximum diameter is measured at the rim. As for restricted vessels, the maximum diameter is on the body and the rim diameter is smaller (Rice 1987). Unfortunately with the samples under research, the orientation of the rim could not always clarify whether the vessel had a restricted opening or not, because of the short heights of the rim sherds preserved. Most of the sherds are very small and in most cases the reconstruction of complete vessels is impossible.

Diameter measurements on rim sherds were only taken where the arc of the sherd has been preserved sufficiently to provide measurable diameter. The measurements were captured by placing the lip across a set of printed concentric circles spaced at 5mm intervals template (Fig. 3.1). The diameter of the circle that best matched the lip's curvature was recorded as the best approximation of vessel mouth diameter (Rice 1987).

For accuracy the inside and the outside readings of the rim were recorded so as to correctly estimate the diameter (Fig. 3.1) and only the best fit was used.

During the recording of the diameter readings, it was important to make a distinction between the diameter readings of the main orifice of the vessels, versus that of spouts and the occasional smoking pipe. Smoking pipes where found at some of the Kenya sites. Separating these diameters at an initial stage was important so as to avoid distorting the average vessel diameter readings within a site. Based on the rim diameter range from all the sites a simple division was decided upon: that diameter readings less than 4cm were either spouts or smoking pipes, whereas rim diameter readings greater than 4cm were considered as the main orifice of the vessel itself.

To classify lip types, the typology developed for Khoekhoe ceramics in the southwestern Western Cape Province by Sadr (Sadr & Smith 1991; Sadr & Sampson 1999) was used (Fig. 3.2). There are basically eight lip types in this system, which are beveled, flat top, everted, thickened round, simple round, tapered, half round and thickened flat. To classify the rim orientation, the typology developed by Sampson & Sadr (1999) was adopted but manipulated so as to represent the samples in this study. The rim orientation was therefore judged as wide-open, open, convergent or vertical (Fig. 3.3). While drawing the rim profiles, precautions were taken and the first was that the sherd be accurately oriented and placed in the position it would occupy if the vessel were set level, otherwise contour and depth will be misjudged (Shepard 1957). The second cause of inaccuracy in rim recording is irregularity of the break. Only when the break extends

vertically from the lip and when it cuts squarely through the wall can the profile be reliably recorded.

Vessel contour is defined as the general outline of the external vessel wall between the base and the lip (Rice 1987). Unfortunately considering the sample used for this research, extensive study could not be done to fully address the shape of these vessels. For illustrating shape, a profile of the rim sherd was drawn. Illustration of rim profile, served two purposes; to show the shape in outline and to show variations in the thickness of the wall. A simple division of the thickness of the walls was used: thin walls are less than 6 mm, whereas thick walls are greater than 6 mm. This range was derived from readings captured from the sample under research compared to pottery of later periods. Sadr and Sampson (2006) confirmed that potsherds from Later Stone Age sites are considerably thinner than Iron Age wares with average thicknesses of 5 mm or 6 mm (except in Kwa-Zulu-Natal Province, where averages are around 7-8 mm).

In some of the samples included in this study, I managed to do careful inspection of the base and exterior sides of the vessels so as to compile extensive notes about the location and density of soot deposits and fireclouds which in some cases is an indication of cooking (Bollong *et al* 1997). Furthermore, notes on temper (either mineral, or grass) and surface treatment (burnished, smoothed, untreated) were also kept. Burnishing refers to rubbing the surface of the vessel with a smooth, hard tool compacting the clay and creating a smooth, shiny surface. Polished surface refers to a very high degree of burnishing.

3.2.1 Limitations

Considering that the sherds under study are thin walled, I was faced with the challenge of working on a highly fragmented sample. This limited the study. For example, comprehensive stylistic analysis could not be done because such a study would require complete pots (Huffman 1980, 2002; Denbow 1981). Assessing the sample, it was apparent that most rims were broken into such small pieces that they could not be used for estimating mouth diameter. Fragmentation often resulted in failure to estimate rim orientation to the vessel's horizontal plane.

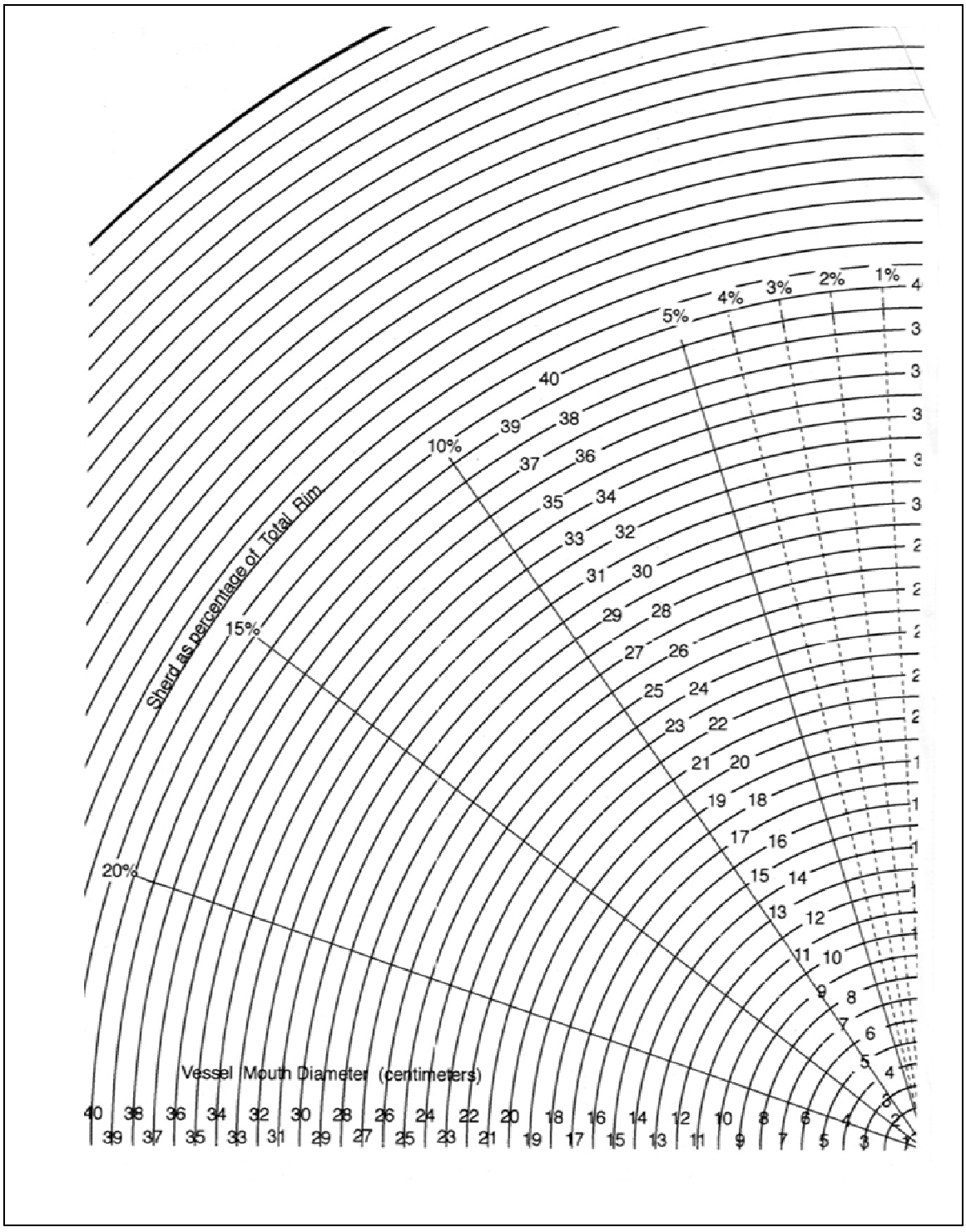


Fig. 3.1. Template of printed concentric arcs spaced at 5 mm intervals for measuring the rim diameter (originally produced by Sampson).

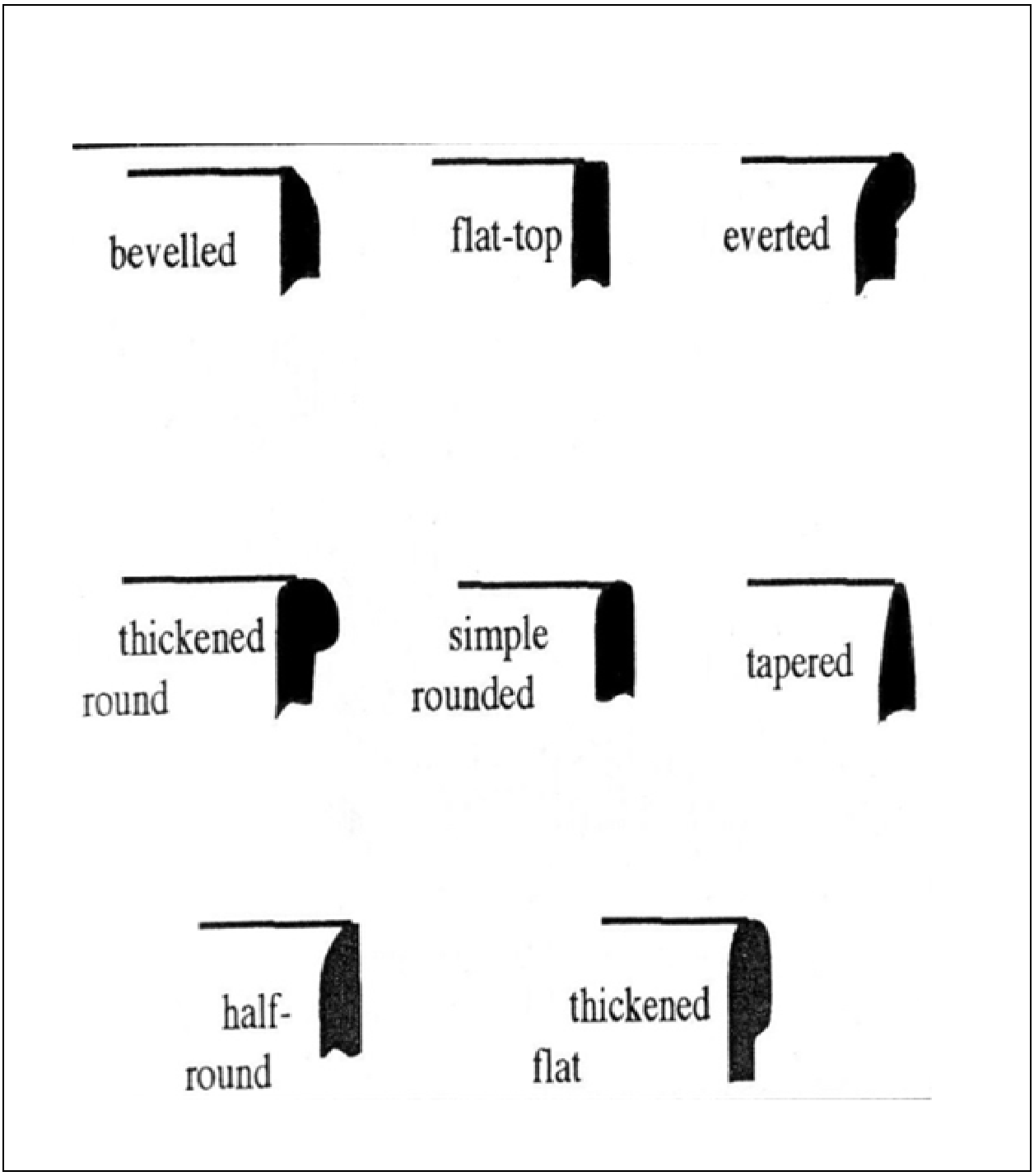


Fig. 3.2. Typology of lip types initially developed for Khoekhoe ceramics in the southwestern Cape (Sampson & Sadr 1999).

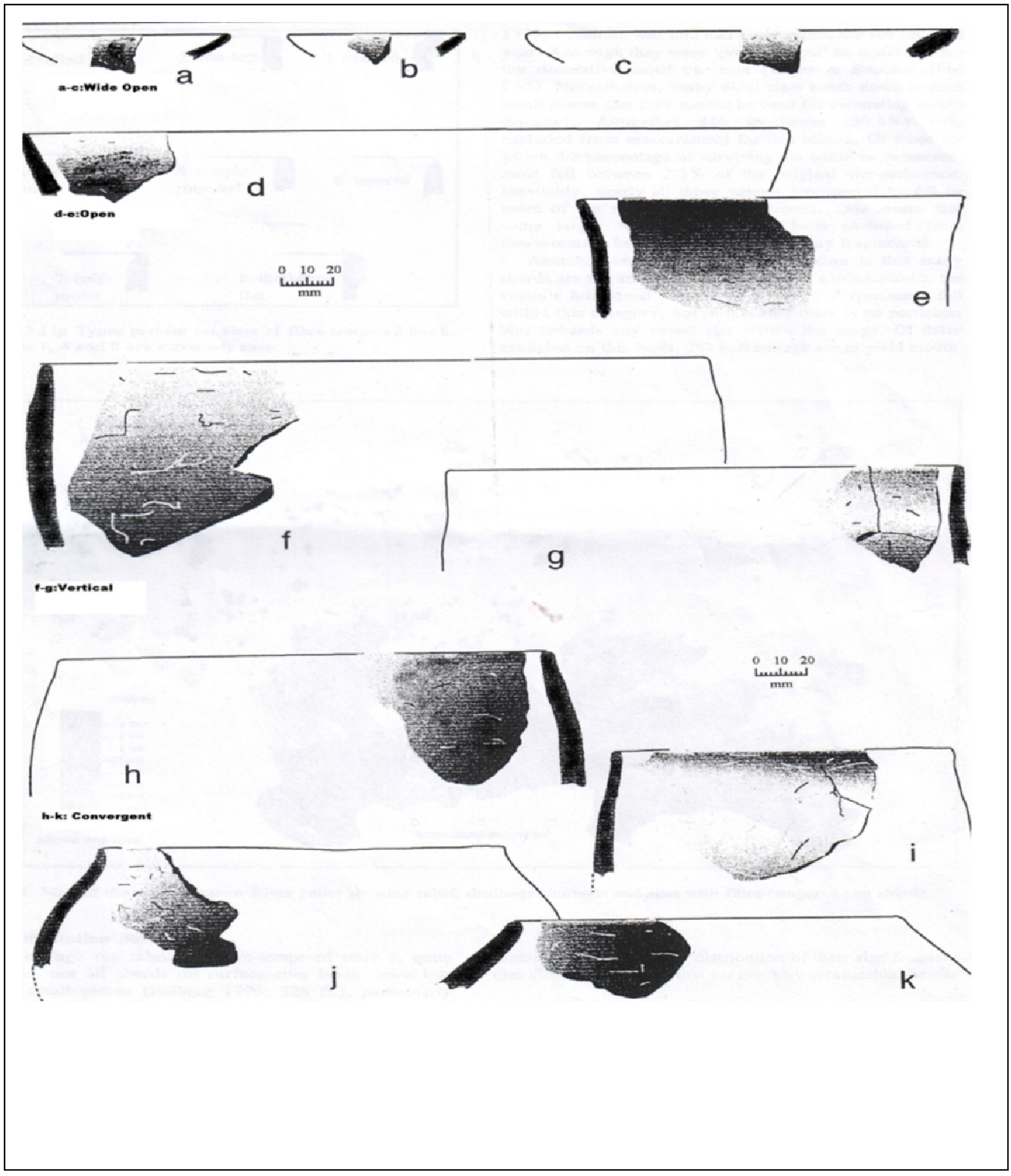


Fig. 3.3. Typology of rim orientation adopted from different fibre- tempered bowls from the Seacow Valley (Sampson & Sadr 1999).

3.3 Decorations

For decorations, each sherd was initially recorded as either decorated or plain, and impressed patterns were recorded according to the classes indicated in the section to follow. In general, decoration refers to intentional marks made on the surface of the vessel. Technique, that is the manner in which the mark was made, is one of the criteria of decoration investigated in this study. Another is motif that is the design as it appears on the vessel. To an extent, a study of motif was limited by the sample, which consists mainly of very small sherds, which do not inform about the overall design of the decoration, or about the placement of the decoration. Therefore, mainly the technique and the location of the decoration were noted. A list of the different patterns and techniques is indicated below.

Impressed pattern

- Impressions, single or multiple dots.

Cord impression

This forms a continuous row of impressions that are usually oblong or oval.

- Parallel dots
- Herringbone pattern of whole lines or dotted lines.
- Zigzag pattern.

Incised pattern

- Narrow line with a v-shape cross section.
- Concave lines in the vessel wall whether by incising or gouging.

Combined incised and impressed pattern

These are made of combinations of impressed and incised elements.

- Straight lines and parallel dots.
- Wavy lines and parallel dots.
- Panel of herringbone pattern.

3.4 Statistical Methods

In the 1950s, statistical methods that were long used in the natural and physical sciences began to be used in archaeology (Fagan 1988). Statistics are defined as that branch of mathematics that studies natural and even cultural variation (Clarke 1994; Orton 1980). One of the uses of statistics was to assist to establish whether an observed difference or relationship between two sets of data is significant or not. Statistics provided quantifiable information on which to base my own conclusions and thereby avoid subjective judgement. In general, statistical tests can measure the probability that, under certain specified conditions; a relationship is significant (Edbon 1977; Hodson 1969; Whallon 1972). Different graphs were used to display data in an appropriate visual form. Both histogram and scatter graphs were used in this study. Histograms, also known as bar diagrams, are a means of showing the distribution of values in a set of data. In general histograms are a visual representation of frequency distribution of a variable. Scatter graphs are just a plot of the values of one variable against values of another (Edbon 1977; Clarke 1994). To plot a large amount of information about a set of data, a box and whisker graph was used.

The statistical analyses used include the Kruskall-Wallis test, which is a non-parametric test, used to compare medians of two or more samples. The null hypothesis, (H_O) is that there is no difference between the means of the samples whereas the alternative hypothesis (H_a) is that there is a significant difference between the means of the samples (Edbon 1977; Orton 1980; Clarke 1994; Drennan 1996). A number of measurements such as median, mean, standard deviation, range etc. were considered in understanding and analyzing the data in detail. Detailed information on how all these statistics were used is provided in the next chapter.

3.5Conclusion

In conclusion all sites as desribed above where chosen along the proposed migration routes based on different evidence. Clearly the dates are different and some are contestable. Noted as a common factor from most sites were the small sample sizes of thin walled pottery. Sample sizes differed from site to site, but all sites chosen have samples that are statistically adequate.

The main focus of this study is ceramic attribute analyses. Patterns and relationships drawn from the analyses were checked statistically to observe whether relationships were significant or not. This comes back to the point that this study intends to measure the degree of diversity or homogeneity in the first millennium thin walled pottery. The following chapter focuses on analyzing all the data and exposing the morphological relationships between the different samples. The observed patterns channelled the argument for or against the Khoe migration model, based on the possibility of establishing a stylistic or morphological chain linking the earliest pottery from Botswana to the Cape.