

CHAPTER VII

DISCUSSION AND CONCLUSION: SALT PRODUCTION IN THE EARLY IRON AGE OF SOUTH AFRICA

Salt production was an activity directly associated with the earliest phases of farming communities in southern Africa. This contextual link is established through radiocarbon and ceramic analysis. The following chapter will discuss the work presented thus far in terms of the organization of production. This will serve to elucidate the character of salt production at Baleni, and place it in context of the Early Iron Age (EIA) of South Africa.

The Demand for Salt

Costin (1991:3) recommends characterizing demand before production organization because demand will determine production features such as “cost parameters, levels of output, appropriate technology and the exclusivity of distribution”. Although demand is an abstract concept, it can be identified through the quantity and function of objects as well as the social characteristics of the society who use them (Costin 2000: 396).

It is difficult to reconstruct consumption patterns for salt due to its absence from the archaeological record outside of its production context. As discussed in Chapter I, salt plays an important part in the diet of agricultural societies. It has been estimated that agricultural communities in semi-arid environments, comparable to the South African Lowveld, would need a minimum of 2g of dietary salt per person per day (Parsons 2001: 4-5). According to this figure, which excludes non-dietary uses of salt, a person would consume 0,72kg of salt per year. This is an estimated figure and can be adjusted up or down depending on assumptions around the actual demand for salt.

Because salt is a universal dietary component, consumption patterns would therefore include every household in a settlement. The presence of the Central Cattle Pattern (CCP) in the EIA implies that the distribution of goods within the settlement did not take place on an egalitarian level. The CCP entails social stratification, primarily indicated by elite burials. These burials are usually associated with special grave goods such as ivory (Huffman 1993: 220). The association between elite status and particular goods imply a situation of restricted

access to certain products. An argument can be made that access to salt within the consumer village could have been controlled by social convention. However, the physical role salt played in the wellbeing of the entire population of a village is likely to negate its exclusive control by individuals of higher rank. Therefore, despite the possible restricted access to salt, controlled by subsets within the village, the wide demand for salt would fall into Costin's (1991:8) "general market of potential consumers" rather than demand by "elite patrons". It is within this framework of general, unspecified demand that salt production was organised at Baleni.

Context: Independent Producers

Unspecified demand is usually characterized by independent producers. Archaeologically, this is reflected in evidence for low capital investment by small groups of producers using basic technology (cf. White and Pigott 1996: 157-158).

The review of salt production methods (Chapter III) indicates that salt production at brine springs usually takes place in three steps. Firstly, the principle method of making brine at these sources is to collect a salt crust that forms around the sources when the waterline recedes (Alexander 1997; Davison 1993; Gouletquer 1975; Junod 1927; Lovejoy 1986; Terblanche 1994; Witt 1966). Brine is made by mixing the collected crust with water and filtered through a strainer. Filters are usually either clay lined baskets held in position by a wooden frame, or pots with a perforated bottom. Once the salt has been leached from the salt crust inside the filter, it is scraped out and discarded. As a result, salt production sites are characterised by earthen mounds formed by the leached out filter content (e.g. Connah *et al.* 1990: 33; Fagan and Yellen 1968: 4; Gouletquer 1975: 49; Sutton and Roberts 1968: 61). These areas usually have a mound-like stratigraphy, with the bulk of the archaeological material being comprised of ceramics (e.g. Connah 1996; Evers 1974; Fagan and Yellen 1968). The final process is the reduction of brine to form crystalline salt. Usually brine boiling consists of simply placing pots filled with brine over a fire (e.g. Connah *et al.* 1990: 33-34; Sutton and Roberts 1968: 61). Reduction processes result in masses of ceramic shards, which usually end up on refuse mounds in the salt workshop. Interiors of ceramics vessels used in brine reduction are usually pitted due to the caustic nature of the brine.

Salt produced in this manner therefore offers archaeologically traceable results. The archaeological deposits at Baleni conform to this pattern in several regards. Firstly, areas of salt production around the Baleni spring, and the swamp into which it flows, are characterised by earthen mounds. Excavations of these mounds (BAL01 and BAL03) indicate a general similarity with ethnographically observed mounds. The mounds have a complex stratigraphy, indicative of a rapid and simultaneous deposition of strata. This is consistent with the recorded process of emptying out basket-type filters. The absence of perforated ceramic bases in the excavations, supplements the view that filters during the EIA were probably of the woven basket type. The general matrix of the excavated mounds is sandy loam with smaller layers and pockets of sand, clay and ash. The sandy loam matrix is most probably the leached out salt crust, since it resembles the soils around the swamp where the crust is formed. Present day saltmakers mix the collected crust with coarse river sand to loosen it up, and to make filtration easier. A similar process would account for the pockets of coarse river sand within the mounds. Woven filters are also lined with clay to waterproof them, and this is probably the origin of the clay strata found in the excavations of these mounds. The burnt exteriors of ceramic vessels and the ash and charcoal strata within the mounds, indicate that brine was reduced over an open fire at the production site. A salt production context for these mounds is also evident in the ceramic assemblages. Excavations of the mounds found that between 73% to 77% of vessels from BAL01 and BAL03 respectively, had heavily pitted interiors. EIA salt producers at Baleni, therefore, undoubtedly made use of the salt crust around the swamp after which it was filtered through a basket type filter. The last production step was to reduce brine over an open fire at the saltworking site.

The salt production context of the ceramic assemblages is not reflected in vessel types or sizes. As indicated in Chapter VI, the ceramic vessels used in salt production, were similar to vessels excavated on contemporary EIA settlements. The Baleni assemblages were characterised by high levels of variation in vessel sizes. The levels of variance were largely similar in all the Baleni assemblages, and also comparable to assemblages from contemporary settlements. This suggests that salt production used relatively unspecialised production tools. Evidence of attempts to maximise production efficiency was also absent in the excavations. Such techniques (as discussed in Chapter III) may include the use of salt gardens, permanent or specialised furnaces to speed up evaporation, arrayed leaching devices, brine tanks or special boiling vessels. Producers at Baleni also did not make use of more durable soapstone

bowls as excavated in the upper levels of the Harmony Saltworks (Evers 1974). Production methods therefore used essentially simple production tools, without great emphasis on efficiency.

Small groups of producers are another characteristic of independent production. The only direct evidence of group size is reflected in the layout of BS05. The settlement contained six huts organised in a semi circle around a single salt production area. If a hut is taken to represent the presence of at least one individual, there were approximately 6 people producing salt at BS05. A similar pattern of small groups of related producers probably existed for production at the salt workshops around the spring as well.

The unspecialised production tools, small groups of producers and the seemingly small scale of production indicate a general theme of low capital investment and are consistent with salt being produced by independent specialists.

Concentration: Non-nucleated Production

Excavations at sites of specialized salt production such as Kibiro (Connah 1991, 1996) and Ivuna (Fagan and Yellen 1968) have produced evidence of permanent habitation at the production sites and suggested nucleated salt production activities. At Baleni, in contrast, the bulk of extraction evidently occurred around the spring and associated swamp. Hundreds of mounds were located in this area, without any evidence of permanent occupation. Opposed to this area of concentrated production, two settlements were located 1,5km away from the spring. The two settlements, BS04 and BS05, lacked features such as pits, grain bins, middens, burials and evidence of stock keeping or metal production usually associated with permanent settlements. In addition, the single, unstratified layer of deposit, and the lack of additional cultural features indicate that occupation at BS05 was not permanent, or only for a very short period. Combined with the data from the mound area (N10/E-24) it is clear that salt production took place during a short period of occupation. The spatial evidence implies that salt production was of key importance: huts were organized in a semi circle around a central area, and it is within this open area that the single salt mound was located. These lines of evidence show that BS05 was a temporary EIA settlement with its inhabitants being actively involved in salt production activities.

Production activities at BS05 do not differ from that of the workshops at the spring (BAL01 and BAL03). This is primarily reflected in the ceramic assemblages. Both areas were similar in terms of multidimensional class types as well as in the variation of vessel sizes. Variation of vessel morphology (as calculated by the Coefficient of Variation for orifice and inflection diameters) were very high in all assemblages. The low levels of standardization of ceramic vessels and the absence of specialist tools suggest that production, within the temporary settlements, was by independent producers making use of unspecialised and basic production techniques. The temporary settlements were obviously not permanent villages established to exploit the available salt resource and, therefore, not centers of nucleated production.

While the evidence is not conclusive in identifying the context of production, no data suggests a permanent production community exploiting the salt spring. If such a community did exist, it was located outside of the immediate study area. Until additional data can prove otherwise, I believe the archaeological evidence indicates that salt production at Baleni was by non-nucleated small-scale producers. The absence of a permanent community at the source, the high variability in ceramic morphology, and production by independent producers are consistent with a scenario where more than one group visited Baleni to harvest salt (cf. White and Pigott 1996: 158). This is concurrent with observations of more recent salt production activities in Africa where production is often by small groups from an assortment of different villages (e.g. Fagan and Yellen 1968; Gouletquer 1975; Sutton and Roberts 1968). At Uvinza in nineteenth century Tanzania, for example, up to 20 000 people came from various villages to the salt spring to harvest salt on a seasonal basis (Sutton and Roberts 1968). EIA salt producers at Baleni were therefore probably not concentrated within a single community, but spread throughout the immediate consumer population.

Intensity: Seasonal Exploitation at Baleni

The presence of temporary settlements such as BS04 and BS05 does raise questions regarding the intensity of production. Production methods at BS05 were comparable to the small scale production efforts witnessed at the workshops around the spring. The need to build a temporary settlement does, however, indicate a situation where salt production extended over a longer period than at the spring. The lack of domestic activities at BS05, as discussed above, implies that activities on site were solely directed to producing salt.

Identifying the intensity of production can elucidate whether this longer period of extraction reflects a different organizational pattern of salt production during the EIA.

Intensity of production essentially reflects the time producers spend on craft activities relative to other economic pursuits. Intensity reflects to what degree production was full time or part time and should not be confused with scale or production output. As indicated earlier, EIA salt production probably made use of the salt crust that forms around the swamp edge and in the nearby swampy depressions. This crust only forms when the waterline recedes. Since salt production is dependent on the decline of water levels in the swamp, salt production, therefore, would have been a dry season activity.

As a dry season activity, salt production would coincide with the primary subsistence activities of agro-pastoral farmers. The primary agricultural products for the EIA were sorghum (*Sorghum bicolor*) and millet varieties such as pearl millet (*Pennisetum americanum*), and finger millet (*Eleusine coracana*) (Hanisch 1981; Klapwijk 1974; Maggs 1984a; Maggs and Ward 1984). In the region around Baleni, millet is sown between October to February, and sorghum between September and December. Reaping takes place from May to July for sorghum, and from June to July for millet (Stayt 1968: 36). Present day rainfall patterns indicate that 90% of rain occurs between October and March during which salt could not have been produced. Subsequently, modern production only starts after May when water levels in the swamp start to drop. This leaves only a small period between August and September within which salt production can occur without conflicting with the harvesting of crops. Reaping time will therefore overlap with the period suitable for salt harvesting. Salt production therefore forms part of a system in which salt and subsistence activities would not necessarily complement each other. Literature also indicates that salt production activities are often characterised by the sexual division of labour (Connah *et al.* 1990: 35; Lovejoy 1986: 122; Sutton and Roberts 1968: 61; Terblanche 1994: 193). Salt production would therefore not necessarily be an activity in which the entire family or village engaged in. A similar scenario during the EIA would explain the small size of the community at settlements like BS05 and BS04. If the small scale production activities as indicated above are taken into account, it seems that EIA salt producers practised a semi-generalised economic strategy by practising agricultural subsistence and supplementing it with short periods of salt production.

Costin states that such a semi-generalised strategy can only take place when technology is “simple or inexpensive” (Costin 1991:17). The data from Baleni suggest that this was indeed the case. Production utilised an essentially straightforward method. This was evidently relatively inexpensive, as witnessed in the two primary production tools: ceramic vessels for brine reduction, and salt strainers for brine filtering. Salt production vessels were similar to ordinary domestic pottery as indicated by comparison with contemporary settlements. The production of ceramic vessels for salt making, therefore, did not entail the manufacture of specialised vessels and ordinary inexpensive household vessels were used. Filters could have been constructed from readily available wood and grass on the site and would have been relatively quick to make (Terblanche 1994; Witt 1966). The availability of fuel for fires to reduce brine would also not have influenced the cost of production. The analysis of faunal samples from the Holocene period in the Kruger National Park (KNP) indicates that climatic fluctuations did not cause major changes in the overall occurrence of animal and plant populations in the northern Lowveld (Plug 1988: 288-292). It is therefore expected that during the EIA, Baleni was also situated in mopane veldt, as found at the site today. This vegetation zone is dominated by dense growth of hardwood species such as *Colophospermum mopane* (Mopane), *Combretum apiculatum* (Red Bushwillow), *Acacia nigrescens* (Knob Thorn) and *Combretum imberde* (Leadwood). All these species have dense wood, which provide high temperatures for a long period of time (Van Wyk 1984). The inexpensive methods of salt production, therefore, lend support to the view of salt production as a low intensity and part-time or seasonal activity.

Conclusion

The archaeological work conducted at Baleni shows that all EIA activities at the site were connected to aspects of salt production. Firstly, excavations carried out in the area where salt mounds were concentrated found no evidence suggesting that activities other than salt production took place around the spring. Similarly, the temporary settlements BS04 and BS05 were without features associated with a typical EIA settlement. EIA activities at Baleni, therefore, revolved around salt production - either immediately around brine sources, or in temporary settlements. This is concurrent with Muller’s (1984) definition of site specialization, wherein salt production was a single, short term activity at a specific location.

The nature of EIA production, raises questions around the suggestion that salt produced in the Lowveld, was geared to meet shortages in food supplies through exchange networks (cf. Hall 1987b). The absence of specialist production as found at Baleni, does not necessarily imply the absence of exchange (cf. Masucci 1995). Part-time economic activities, such as salt production, offer producers the opportunity to manufacture small quantities of surplus goods for trade. This can provide “economic insurance against lean times” (Masucci 1995: 80). To prove this, the archaeological data should indicate that salt was produced beyond levels of local consumption. Because salt is mostly consumed, and dissolves when deposited, there is no direct way to ascertain whether it was widely traded.

The contextual evidence from the production facilities at Baleni does provide some speculative answers to this question. EIA salt production represents small, non-specialist activities within domestic contexts by non-nucleated producers. The evidence for dispersed producers negates the value of salt as a locally exchanged commodity, since local communities could be self-sufficient in terms of their salt supply through production forays to the spring. This implies that salt could have been obtained without relying on local exchange networks.

Evidence for trade from the earliest phases of the Iron Age in southern Africa is largely fragmentary. Most of the material from EIA contexts dates to late in the second half of the first millennium AD and therefore lies outside the temporal frame of this dissertation. While the spatial extent of early trade is unknown, a ninth century glazed Islamic shard and a glass bead from KwaGandaganda in KwaZulu-Natal, may indicate that coastal contact could have extended as far south as Durban by the ninth to tenth centuries AD (Whitelaw 1994). Trade contacts from this period are displayed on many inland sites by the presence of marine shells (Maggs and Ward 1984; Van Schalkwyk 1994; Voigt and Peters 1994; Whitelaw 1993, 1994) and glass beads from the Kruger National Park (Meyer 1986). The exact relationship between the coastal points of trade and the interior, however, is poorly understood, especially during the period covered in this study. It is therefore unclear what role salt played as a trade commodity during the early first millennium. Although surplus salt may have been exchanged to supplement subsistence strategies, this was seemingly small in scale and did not form the economic base of the producers (cf. Muller 1986). Production at Baleni does not conform to Costin’s (1991: 4) definition of producer specialization as the “institutionalized production system in which the producers depend on extra-household exchange relationships at least in

part for their livelihood, and consumers depend on the acquisition of goods they do not produce themselves”.

Such a level of production, as defined by Costin, suggests organization on a scale resembling that of Kibiro in Uganda. Here, salt was produced with the specific aim of trade to supplement food supplies. Production at Kibiro is characterised by efforts to maximise production, primarily by means of saltgardens. The construction and maintenance of the saltgardens is a time consuming and labour intense operation. Present-day producers are mainly women who lived in Kibiro village and trade salt on local markets. Producers are, therefore, nucleated in a single production location, and goods are transferred between the producers and consumers. Production at Kibiro, therefore tends to be more than just a short term or temporary effort.

The organization of salt production at Baleni stands in marked contrast to that of Kibiro. Baleni production was by non-nucleated, independent producers and was temporary in nature. Production can only take place on a seasonal basis because it was dependent on receding waterlines around the main swamp and within the smaller swampy depressions. As a dry season activity, it fell within the same period as crop harvesting. The unspecialised nature of salt production suggests that these communities would have been involved in normal subsistence strategies for most of the year.

Two related patterns of extraction can be identified at Baleni during the EIA. Firstly on a temporary basis in production areas at around the brine sources, and secondly within temporary settlements located a distance away from the areas of concentrated production. Both levels of production point to a scenario where salt production took place during forays to Baleni by surrounding communities. The lack of evidence suggesting that salt production was a specialized activity during the EIA, indicates that salt production was probably not aimed at the production of surplus. Communities probably met their own demands for salt through direct access and extraction at the source. The self-sufficient nature of extraction at Baleni corresponds to the procurement of iron ore resources by EIA communities. KwaZulu-Natal and Mozambique Kwale villages are mostly situated near ore sources (Morais 1988; Whitelaw and Moon 1996) and residues from metal production within villages are typically very limited (Whitelaw and Moon 1996). This indicates that villages were procuring ore in small quantities for use within the village.

Salt production at Baleni also corresponds to other studies on EIA exploitation of natural resources. The clearest analogy is from shellfish gathering by Mzonjani communities in KwaZulu-Natal. Settlements are typically situated up to 8km away from shell middens. These middens lack signs of architecture, metal production or stock keeping, activities normally associated with settlements. The relative absence of shell within the Mzonjani levels indicates that shellfish were transported to the village where it was processed (Horwitz *et al.* 1991). The close proximity of settlements to the coast meant that inhabitants could make daily visits to gathering points to harvest enough shellfish for use within the village (Maggs 1984b). This meant that prolonged forays to the coastline were unnecessary. Longer periods of exploitation are only associated with later Msuluzi, Ndondondwane and Ntshekane ceramic phases when villages were situated further away from the coast and when there was a marked population increase (Horwitz *et al.* 1991).

This offers possible interpretations for the pattern witnessed at Baleni. As with exploitation at the shell middens, the production of salt at the swamp shows no evidence for prolonged exploitation but, rather, is indicative of short forays by nearby communities. This correlates to existing production patterns witnessed at Baleni by Witt (1966). He found that salt production only takes place for a few days and saltworkers bring sleeping mats and erect temporary shelters from branches. This short term extraction process would not leave any archaeological traces, as indicated by the paucity of evidence suggesting habitation around the spring. More prolonged extraction of shell middens are associated with larger communities living further away from collection points. A similar pattern can possibly explain the prolonged extraction as indicated by the temporary settlements BS04 and BS05. It would not be efficient for communities situated a few days journey from Baleni to make regular short trips to the salt spring. A more practical option would be prolonged periods of production. Judging from current rainfall patterns, prolonged extraction could only take place for a period of less than two months without actively infringing on subsistence activities. This semi-temporary exploitation is consistent with the archaeological data from BS05. Occupation of the site was not long enough for extensive archaeological deposits to accumulate and for normal subsistence activities to take place on the site. This may well reflect a pattern of short seasonal exploitation by communities that live further away from Baleni.

This pattern of short-term production forays to Lowveld salt sources has previously been postulated by Evers and Van der Merwe (1987) for the Eiland ceramic phase. The Eiland

Saltworks, located 60km south west of Baleni, falls within the distribution area of Kgopolwe ceramics (see Chapter VI). The authors hypothesise that the Eiland ceramics in salt production mounds, were from communities living on the escarpment within the traditional distribution zone of Eiland. This means that communities made approximately a 50km trek to the salt source. Although this hypothesis of Eiland production patterns needs testing, it complements the model of early salt production at Baleni.

The current data from Baleni is consistent with the suggestion of part-time or seasonal production on a small scale, by independent producers. Salt, during the Early Iron Age, was produced for general unspecified demand, by multiple producer communities that took advantage of the localised salt resource. Salt production at Baleni can best be characterised as the transient or seasonal exploitation by small groups of producers and should be approached as the small-scale participation in an activity vital in the daily life of local populations.

Although salt production has been long recognized as an economic activity of EIA society, this study is the first to explicitly examine the context and organization of production. On a whole, the results of this dissertation complement studies that have focused on village organization and the exploitation of other natural resources. Although the views do not necessarily necessitate a revision of current views on EIA society, it does indicate that archaeologists should approach production systems with caution, and base statements on well founded empirical data. The research has shown that production sites offer a wealth of information concerning the social and economic contexts in which production takes place. The study also shows that ceramic assemblages have the potential to provide answers beyond mere temporal classifications. As the most abundant artifact on Early Iron Age sites, ceramic vessels have the potential to inform archaeologists on a range of questions concerning production activities, as well as the context in which artifacts are used and deposited.

This study of salt production at Baleni is, however, far from comprehensive and many questions still remain unanswered. A major aim of future research should be to determine how the organization of salt production change over time and if it reflects larger socio-political development in southern Africa. It would be of immense value to future research to identify the actual settlements where salt producers came from, and determine how salt production is reflected at these sites. This will also give a better indication of the spatial

distribution of producers. There is, therefore, a need to expand the existing survey area around Baleni, and indeed the northern Lowveld as a whole. There is still too little known of the first farmers in southern Africa.