CHAPTER I

BALENI AND EARLY IRON AGE SALT PRODUCTION

> *Modern Westerners are accustomed to cheap and easily available salt, so plentiful and most omnipresent that much of its consumption goes virtually unnoticed; it is one of the plentiful and most utilitarian materials in our lives. It is difficult for us to appreciate how scarce, highly valued, and eagerly sought-after salt has been in so many premodern societies, ranging from isolated tribal groups …to highly centralised states…*
>
> (Parsons 2001: 3)

As the quote by Jeffrey Parsons above indicates, salt was often a highly valued commodity in prehistory. The varying degrees of physical, economic and social values attributed to salt, means that the archaeological study of salt production offers an exciting window onto the socio-economic world of the past.

Introduction

Salt production, exchange and use, have been the subject of academic attention for a very long time. Pliny the Elder made a comprehensive statement about the production, exchange and use of salt in the Classical world, while Tacitus, another Roman scholar, gave accounts concerning the violence that could erupt from competition over salt sources in the Roman provinces (Parsons 2001:1-3). In more recent times, salt and salt production have been the focus of numerous archaeological studies (e.g. Alexander 1997; Briggs 2003; Connah 1991, 1996; Davison 1993; De Brisay and Evans 1975; Evers 1974, 1981; Fagan and Yellen 1968; Flad *et al.* 2005; Muller 1986; Parsons 2001; Sutton 1983; Williams 1999; Young 1977). In this dissertation, I explore Early Iron Age (EIA) salt production at the Baleni (sometimes referred to as Sautini) geothermal spring. The specific aim is to determine how early farming communities in southern Africa organized salt production. I intend to argue that the context, concentration and intensity of salt production during the EIA is consistent with patterns of seasonal, small-scale production aimed at local consumption.

At the base of any archaeological enquiry into aspects of production, consumption and trade, are the values attributed to salt. Common "salt" (the combination of sodium and chloride ions to form NaCl), is essential for human health and the average adult body contains

approximately 250g of sodium. Salt is especially plentiful in body fluids ranging from blood, sweat, tears, semen and urine (Harvard Medical School 2003: 1). Sodium regulates the exchange of water between cells and the surrounding fluid that carries food in and takes out waste (Young 1977: 381). A lack of sodium ultimately causes dehydration, low blood pressure and eventually death (Harvard Medical School 2003: 1). The estimated normal salt intake per day is 5 – 20g with a more or less equivalent loss, mostly in the form of urine (Carter 1975: 13). Medical studies indicate that when dietary salt is in low supply, the body can conserve sodium, drastically reducing the amount excreted in sweat and urine (Harvard Medical School 2003: 1). To avoid sodium deficiency, humans need at least 2g of salt per day (Alexander 1993: 652). Although sufficient levels of salt can be acquired through meat, blood and urine, communities with predominantly cereal diets need a supplementary intake of salt (Alexander 1997). Domesticated animals also need additional salt in their diet. In central Niger salty earth that forms through the evaporation of brine on clayey soils, is sometimes collected and given to animals providing them with additional salt (Gouletquer 1975: 47). Sometimes metaphysical qualities are also attributed to salt. In West Africa, for example, certain fashionable, social and religious observances require particular kinds of salt to be obtained either as a condiment or for offerings (Alexander 1997: 535-537).

Salt Production at Baleni

Almost four decades of research on the Early Iron Age (EIA) in South Africa have led to the development of a relatively well understood culture historical sequence. With the emphasis on prying out the development and migration of communities, questions still surround the social, political and economic aspects of this period. Arguably, archaeologists can better study aspects of prehistoric economic systems by focusing on sites of production, than by producing large scale regional syntheses (Costin 1991: 1). This dissertation aims to expand research on these aspects of EIA society, by investigating salt production during the EIA. The study focuses on the Baleni Saltworks, located in the South African Lowveld. Baleni is one of the last remaining brine sources in the Lowveld with its archaeological record of salt production activities still intact.

The Baleni geothermal spring has long been recognised by archaeologists as a site of prehistoric salt production (cf. Evers 1974, 1981). Today, salt is still produced on a small scale by the local population. Brine springs like Baleni, form one of the primary sources

where salt can be produced. Salt can also be obtained from secondary sources such as ashes from certain plants species (Alexander 1997; Davison 1993: 10-16; Gouletquer 1975: 51; Parsons 2001: 222-227). Extraction from plants, however, is usually a laborious process and the resultant salt is potassium rich and therefore bitter tasting (Gouletquer 1975: 51). As a result, salt from mineral sources such as brine springs, where large quantities of pure salt can be extracted, are usually preferred (Alexander 1997: 536). Due to the general demand for salt, and the localised nature of salt sources, it was frequently traded via local and long distance exchange networks (e.g. Alexander 1993, 1997; Bower 1993; Briggs 2003; Kopaka and Chaniotakis 2003; Meier 2004). Its role as a trade item is in part facilitated by the ease with which salt can be transported and divided into smaller packages of durable, standardized units (Parsons 2001: 221).

The role that salt played as a trade item in southern Africa during the sixteenth to nineteenth centuries has often been emphasised in historical literature (De Vaal 1984, 1985; Harries 1978, 1994; Newitt 1995). These sources indicate that salt produced at Baleni and other Lowveld sources, formed part of a group of trade items, including gold, ivory, beads, cloth, slaves, iron and copper, all of which were largely interchangeable with each other (De Vaal 1984, 1985; Harries 1978; Mutoro 1998; Pwiti 2005). This long-distance trade led to the development of specialised producer communities in the Lowveld and adjacent regions. The most prominent of these specialist communities were the iron producers of Phalaborwa. Plug and Pistorius (1999: 177-182) interpret the specialist iron production by these communities as being part of a system whereby producers traded iron for essential foodstuffs to combat inequalities brought on by the arid Lowveld climate.

Some authors (e.g. Hall 1987b: 65-66; Mitchell 2002: 279) hypothesise that salt functioned in similar exchange transactions during the early first millennium. They believe that salt, extracted from Baleni and other Lowveld sources, was used to combat environmental constraints during the early first millennium AD. This implies a degree of producer specialisation since "some communities were making a living by bartering with other villages"(Hall 1987b: 65). Rice (1981: 219-220) views this adaptive process in the "dynamic interrelationship between nonindustrialized society and its environment" as one of the defining characteristics of specialised production. Such a model of EIA salt production, however, first needs to be tested against the available archaeological data. Any argument for specialist production must show that "simpler, domestic production systems are inadequate

to account for the observed archaeological data" (Muller 1986: 406). As a result, production must first be analysed in terms of the organising principles that situate it in time and in physical and social space. This forms the main thrust behind the research at Baleni. For this study, I analyse the temporal patterns of production to relate production to the daily and seasonal scheduling of work and issues of part- as opposed to full-time production. From the spatial loci of production, I infer aspects of the general organization of work and the relative concentration or dispersal of manufacturing activities. These are important factors since they affect how producers interact with consumers and how consumers acquire goods (Costin 2004: 191). How these aspects define the production of salt during the EIA at Baleni forms the aims of this dissertation. By analysing the context, concentration and intensity of production, I argue that salt production during the EIA of South Africa, was a part-time, seasonal activity, practised on a small scale by independent producers for local consumption.

The Organization of Early Salt Production at Baleni

Costin (1991: 3) defines production as "the transformation of raw materials and or/components into usable objects". Archaeologists generally view production either as domestic or specialised. Both states are seen as a reflection of the underlying principles by which production is organized.

In addressing archaeological approaches to the organization of salt production, Muller (1984) makes the important distinction between site specialization and producer specialization. Site specialization is defined as when a single, short term activity is carried out by an entire social group (Muller 1984: 490-491). Limited activity does not, however, directly imply producer specialization. To argue for specialisation the evidence should indicate that the producers' economic base lies in the activity in question (Muller 1984, 1986). Jon Muller (1984; 1986) showed that at the Great Salt Spring in the Ohio Valley (USA), activities were limited to salt production, possibly indicating site specialization. The great uniformity of craft tools used in the production process did not, however, match the levels of standardization expected to be characteristic of full-time specialization. The evidence thus suggests that although the Great Salt Spring was a limited activity site (i.e. exhibited site specialization), producer or craft specialization did not take place.

Costin (1991: 4) defines 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". Producer specialization is therefore a state whereby individuals gain part of their income through participation in a specialist activity (Costin 1991: 4-9; Muller 1984: 490-493; Muller 1986: 407). This implies that specialization is restricted to a specific subset of society and the production of commodities for exchange. Central to this statement is the understanding that specialist producers do not produce all the goods they consume, and that the production activities are regularised and predictable (Costin 1991: 4-9). This means that this production activity is the central and critical economic function for the producer. The exchange of salt for vital foodstuffs during the EIA, as proposed by Hall (1987b: 65-66), would therefore be characterised by specialist production, since producers were dependent on the surplus production of salt.

In developing a working model for the organization of production, Costin (1991) created a synthesis of variants and their possible archaeological manifestations. In the process, she identified a set of parameters that can best explain the organization of production. By investigating the organization of production, I aim to move beyond minimal references to the absence or presence of craft specialization at Baleni. I employ Costin's parameters of context, concentration and intensity as heuristic devices to discuss the character of salt production at Baleni during the EIA of South Africa.

Context of Production

The context of production reflects the nature of the demand that exists for a particular good. We can distinguish between attached and independent context production (Brumfiel and Earle 1987). This division determines whether the mode of production was for special high-value goods for elite consumption (attached), or whether it was for the production of utilitarian goods for broad unspecified demand (independent). In the absence of a highly stratified society during the EIA, it is expected that salt production was by independent producers. It is, however, necessary to determine whether production at Baleni is consistent with patterns expected for independent production by looking at the demand for salt, and the technology employed in salt making activities at the site.

Concentration of Production

Concentration essentially describes the spatial relationship between producers and consumers. The spatial context of production forms the primary data to reconstruct the "social context of production" (Costin 2000: 384). The level of concentration describes whether producers are uniformly dispersed throughout the consuming population, or nucleated within a single production location, as well as the degree to which the subsequent products are transferred between the producer and consumer communities (Costin 1991: 27-29). Nucleated production is usually associated with more specialised or full-time production. The localization of production centres can be caused by many factors. For example, non-specialist production can be localized at concentrations of natural resources such as brine springs (Muller 1984, 1986), and do not necessarily reflect the presence of full time producers, but rather domestic production levels.

Intensity of Production

Intensity describes the amount of time producers spend on craft activities relative to other economic activities. This reflects whether production was part-time or fulltime, and is approached as a continuum rather than a dichotomy (Costin 2000: 378). Muller (1984: 490-491) emphasises the amount of time devoted to the activity and its interference with other subsistence activities. Fulltime production efforts are usually taken to indicate high levels of specialization. Costin (1991: 18) points out that independent producers are less likely than attached producers to be full-time. Likewise, technologically less expensive industries are more likely to be part-time than technologically expensive ones. If production at Baleni was a part-time activity, producers would combine salt making with agricultural production. This "semi-generalized strategy", however, can only be practised when the technology is "simple or inexpensive" (Costin 1991: 17).

The Technology of Salt Production

The approach to production at Baleni will draw heavily on the technology of salt production during the EIA. This is necessitated by the fact that salt itself leaves no archaeological trace, since it is usually consumed, and even when it is deposited, it quickly dissolves. Despite the absence of salt in the archaeological record, production debris provides contextual evidence for salt production. This approach reflects the increased archaeological interest in

technological studies as sources of inference for both analytical and theoretical research (cf. Stark 1998: 5).

The approach to production technology has always mirrored trends in general archaeological theory. As is widely known, studies in material culture formed the foundation of early anthropological and Americanist archaeological research (Pfaffenberger 1992: 491-493). As the goals of anthropology changed after the 1920's, most cultural anthropologists lost interest in studies of technology and material culture. Archaeologists on the other hand retained this interest, since this topic formed the basis of the construction of culture histories and regional chronologies (Stark 1998: 3). Archaeological research on material culture faded after the introduction of Processual Archaeology in the 1960's. Material culture was rejected as a valid research topic since it was generally associated with narrow description and a lack of an appropriate theoretical framework (e.g. Longacre 1975). One area of archaeological research in which production technology received explicit attention during this period, was "middle-range" or "actualistic" research (Binford 1983). The result was that traditional technology was subordinate to research that provided models of spatial variability or tests of social inferences (e.g. Gould 1980). One direct result of the New Archaeology's approach to material culture was the division of technology, function and style. Technology was defined as raw materials and production steps, while function became associated with utilitarian purposes. The study of technology remained without any explicit theory primarily because it was viewed as an "extrasomatic means of adaptation" (Binford 1965: 205).

Archaeological approaches to technology began to change when ethnoarchaeological studies showed that the makers and users of material culture routinely blur the distinction between technology, function and style (e.g. Hodder 1982). Technology is no longer seen as simply governed by environmental pressures, but also as reflecting aspects of social and economic behaviour (Costin 2000: 382-383; Stark 1998: 4-5). Archaeologists increasingly use a holistic framework that examines both technical (i.e. ecological and economic factors, as well as the mechanical and functional properties of artefacts), and cultural factors (historical, political and social). Torrence (1986) for example, develops models from diverse ethnographic descriptions of production lithic tools. This she combines with descriptive statistics of the standardization and specialization of production debris on Melos Island in the Aegean. The lack of standardization of obsidian artefacts on Melos, she argues, indicates little control in the production process. This implies that production was carried out opportunistically by

many different craftsmen. Similar analyses have been applied to the study of ceramic production. Rice (1981), argues that the variation in technological characteristics such as paste, temper and firing, indicates the relative number of hands at work. Other important studies include the work by Costin (1991, 2000, 2004) and Hagstrum (Costin and Hagstrum 1995) who make use of ethnographic models to investigate the nature and the organization of production and exchange in ceramics, following Inca imperial conquest of the Andean central highlands.

The approach to constructing an ethnographic analogy of salt production in this dissertation, closely follows these examples, which are sometimes referred to as "neoprocessual ethnoarchaeology" (cf. Stark 2003: 201). In formulating general hypotheses, to explain the archaeological record, I draw on the archaeological evidence of salt production as well as ethnographic and historic accounts that inform the archaeological data. Salt production methods from Baleni and other salt production areas in Africa provide a large body of comparative data (discussed in Chapter III). These are used to create a formal analogy, strengthened by the similarities in environment (i.e. salt springs), cross cultural uniformity (by drawing on examples from across Africa) and the physical and archaeologically observable traces left by salt production (cf. Lane 1994/1995). I draw on this wide body of data not only to pick up trends in salt production, but also to avoid the problems generally associated with extrapolating ethnographic data back in time. The analogy serves as a tool for understanding the organizational system of salt production at Baleni during the EIA, and explains the formation of the archaeological record (cf. Stark 2003: 201-202).

Identifying Context, Concentration and Intensity

The principal archaeological artefacts associated with salt production are ceramics vessels. The assemblages from Baleni therefore represent an opportunity to characterise production during the EIA in terms of production technology. In Chapter VI, ceramic assemblages from salt production contexts are analysed in terms of vessel morphology in order to ascertain the variation in production tools. I focus on vessel attributes of size, as this may reflect functional aspects of salt production. A statistical approach is used to analyse the variability of the ceramic assemblage in terms of orifice diameter, inflection and maximum diameter. Coefficients of Variation, as the standard statistic in studies of variance, identify the levels of standardization present in the ceramic assemblage. The emphasis falls on the identification of

special purpose production "tool-kits". The presence of such evidence suggests efforts to maximize production (Torrence 1986: 43). The results from Baleni will indicate the degree to which the ceramic vessels, as production tools, were standardised or special salt production vessels. Through comparisons with contemporary EIA settlements, the analysis will show whether these production vessels constitute specialised tools or ordinary, "everyday" vessels. For production at Baleni to be independent, the archaeological data should reflect production by small groups of producers using basic technology, not aimed at mass production (Costin 1991: 25-27). This is contextualised by the comparative body of data and should show up in the archaeological record in a lack of evidence for maximising efforts, and unspecialised production tools with low levels of standardisation.

At Baleni, the concentration of salt production will be measured by the permanence of the communities exploiting the salt resource. The absence of a permanent producing community will indicate a scenario where more than one group visited Baleni to harvest salt during the same general period. Comparative data suggests that, in similar scenarios, nearby communities often made longer (monthly/seasonal) visits to the natural source to fulfil their own demands (cf. Burton 1984; Sutton and Roberts 1968; White and Pigott 1996). With this in mind, I formulated a research strategy (presented in Chapter V) to investigate the possibility of exploitation by a permanent community, as well as temporary exploitation of varying lengths of time.

Intensity is difficult to determine directly from the archaeological record. Inferences tend to be indirect and reliant on ethnographic analogy (White and Pigott 1996: 159). To measure the intensity of salt production at Baleni I turn to the observed salt production methods presented in Chapter IV, and discuss it in terms of the seasonality of production, and how it relates to the subsistence strategies of EIA communities.

Frameworks

The immediate spatial frame for this study is the Baleni spring and the area within a radius of 1,5km from the spring centre. It is within this area that salt production at Baleni is concentrated.

Chronological and spatial divisions in the southern African Iron Age are primarily established through ceramic and radiocarbon methods. The research question and discussion presented

in this dissertation, focus on salt production by the Early Farming Communities identified with the Urewe ceramic tradition's Kwale branch. This ceramic tradition is associated with the earliest expansion of farming communities along the eastern half of southern Africa. In southern Africa, Kwale is characterised by two ceramic phases, Silver Leaves and Mzonjani. The Silver Leaves ceramic phase is generally seen as ancestral to Mzonjani and is distinguished from it by minor typological differences in assemblages (Klapwijk and Huffman 1996: 90-91). The close relationship between the phases is emphasised by the fact that until recently, they were regarded as one entity, and referred to as Matola (e.g. Maggs 1980a, 1984b; Whitelaw and Moon 1996). The distinction between Silver Leaves and Mzonjani refers to small scale temporal differences and do not reflect social and economic differentiation. Since this dissertation aims to characterise salt production by early farming communities, the timeframe under study covers the Mzonjani and Silver Leaves ceramic phases and therefore roughly the period between the first and sixth centuries AD.

Briefly stated, the archaeological framework of this dissertation covers salt production activities during the early first millennium AD at the Baleni salt geothermal spring. I intend to clarify the character and organization of salt production during the EIA at Baleni through a discussion of the parameters of context, concentration and intensity. The discussion will draw on ethnographic and archaeological literature, as well as primary empirical research conducted at Baleni. Additionally I will also provide the cultural historical sequence of salt production and related activities at Baleni that was uncovered in the course of the research. This is the first study in South African archaeology concerned with the organization of salt production by communities from this period. I will review the spatial and archaeological frameworks of the research in the following two chapters.