

To Ian, Jessica and Sean

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Minerals and Managers

Production contexts as evidence for social
organization in Zimbabwean prehistory

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Abstract

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In the Zimbabwean past, farming societies utilized mineral resources for their own use and for exchange to local and regional populations, as well as to markets beyond African borders. Successful agriculture was constrained by environmental hazards, principally unpredictable and often inadequate rainfall. Farming communities managed this predicament in various ways. It is likely that some groups used mineral resources found in the vicinity of their settlements to produce materials or items to exchange. The social contexts that defined the nature of mineral production and exchange altered between the mid-first and mid-second millennium AD, as social ranks emerged and political and economic systems became increasingly complex. The thesis is a commentary on how the motivation of society to broaden its resource base, to improve the benefits to households and to society in general, contributed to the emergence of leaders and, ultimately, of an elite class. The focus of the research is on iron and copper production because the author has examined gold production thoroughly in a previous study. Four published papers outline the history of iron and copper production in Zimbabwe. The papers provide case studies of the scale and social context of iron and copper production and exchange.

Keywords: Zimbabwean past, farming communities, environment, mineral resources, mineral production, social organization, social change

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Contents

Research papers	7
Acknowledgements.....	8
1. Introduction	9
1.1 Minerals in Zimbabwe: a long history of resource use.....	9
1.2 The physical context: a regional spectrum of resources	10
1.3 The research topic.....	11
2. The archaeological, environmental and intellectual setting.....	12
2.1 Processes of mineral production in Zimbabwean prehistory: an overview	12
2.2 The forces of nature: an unpredictable environment for agriculture.....	13
2.3 Signs of the times: patterns of social and political change in southern African prehistory .	15
2.3.1 The introduction of farming and metalworking – fifth to seventh centuries	17
2.3.2 The beginning of economic expansion – eighth to tenth centuries	18
2.3.3 The rise of social hierarchies – early second millennium AD.....	19
2.3.4 The Zimbabwe sovereignty - mid-second millennium AD	23
2.4 Defining social organization and explaining social change	24
3. Changing patterns in the social organization of mineral production.....	29
3.1 Introduction.....	29
3.2 Strategies for survival: responses to environmental constraints.....	29
3.2.1 Interpretations based on archaeological and historical evidence	29
3.2.2 The question of surplus production.....	31
3.3 Perspectives on the social contexts of mineral production.....	32
3.3.1 The first farmers – mid-first millennium AD	32
3.3.2 The beginning of economic expansion - later first millennium AD	34
3.3.3 Socially ranked societies of the early second millennium AD	36
3.3.4 The Zimbabwe sovereignty - mid-second millennium AD.....	38
4. Conclusions and future perspectives	41
References	42

Research papers

Paper 1. Swan, L. 2003. Forests, farmers and furnaces: the potential ecological impact of prehistoric mining and metallurgy in Zimbabwe. In *Climate Change, Trade and Modes of Production in Sub-Saharan Africa*, F. Chami, G. Pwiti & C. Radimilayi (eds), 39-58. Studies in the African Past 3. Dar es Salaam: Dar es Salaam University Press.

Paper 2. Swan, L.M. 2007a. Early iron manufacturing industries in semi-arid, south-eastern Zimbabwe. *Journal of African Archaeology* 5(2), 315-338.

Paper 3. Swan, L. 2002. Excavations at Copper Queen Mine, northwestern Zimbabwe. *South African Archaeological Bulletin* 57, 64-79.

Paper 4. Swan, L.M. 2007b. Economic and ideological roles of copper ingots in prehistoric Zimbabwe. *Antiquity* 81, 999-1012.

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1. Introduction

1.1 Minerals in Zimbabwe: a long history of resource use

The mineral wealth of southern Africa played a large part in the successful economies of the region in the twentieth century. Minerals have been exploited during the past two millennia in entirely different political and economic settings. In these settings, complex political systems developed and attained dominion over large areas. In modern times, a wide range of precious and base metals have been exploited. In prehistory, society made use primarily of iron, copper and gold resources. During the latter part of the second millennium AD, tin was used and copper alloys were produced.

Information about the socio-cultural contexts within which metals were produced and used, however, is not as abundant as it might be. The chronological and socio-economic context of gold production and trade has been largely reconstructed but insufficient data is available to enable similar interpretations of copper and iron in Zimbabwean prehistory. An approach to gold production used a spatial and chronological analysis of gold workings and archaeological settlements to examine patterns in the socio-cultural context and the spatial distribution of sites (Swan 1994). This identified patterns in the distribution of gold production and trade, including relationships between the different strata of society. The nature of archaeological evidence for copper and iron production does not lend itself to this type of quantitative spatial analysis but it is still helpful to seek patterns in the distribution of sites where iron and copper were extracted, and where ores were processed and metal artifacts were produced. This line of questioning has the potential to provide information about the social organization of mineral production in prehistory.

Little is known about the social relations that governed mineral production in the Zimbabwean past, although recent work has used ethnographic and historical examples to address this line of research (Chirikure 2007). It is helpful to consider production of metals in conjunction with other branches of production. Zimbabwe is a country with diverse resources. Farming communities in the past utilized these not only to provide subsistence but also to develop manufacturing industries for local and long

distance trade. Facing relatively harsh and unpredictable environmental constraints, farmers had to manage subsistence strategies carefully. Diversification of production was one way to achieve this.

Shona farming communities in Zimbabwe organize agricultural production at several levels; the household or nuclear family, *imba*, the village, *musha*, the ward or group of villages, *dunhu* and the larger regional grouping, *nyika*. During planting, harvesting and threshing, members of a household would, traditionally, brew beer and invite other families of the *musha* to participate in a work party, *nchimbe* or *humbe* (Holleman 1951; Mudenge 1988). Other subsistence activities such as hunting and fishing were sometimes organized on a communal basis too. In the past, tributes of grain were required by the sub-chief, *sadunhu*, and by chiefs, *madzishe*, whose authority was at the level of the *nyika* (Mudenge 1988).

Archaeological research has not yet been able to show how far the traditional organization of production outlined above was founded in the prehistoric period and, of particular interest, how far production contributed to political stratification. In a detailed overview of sectors of production reconstructed from previous archaeological research, Sinclair (1987) pointed out that archaeological data for the social relations of production was lacking and pinpointed the difficulties in interpreting the social principles which guided the organization of production. Consequently the contribution of surplus agricultural, mineral and craft production to social stratification in the Zimbabwean past could not be defined. There is a challenge to explain how the political advantage of the elite was established and maintained and to understand, for example, how the benefits enjoyed by elites were distributed to the lower ranks of society (Pikirayi 2001).

I suggest that patterns in the distribution of archaeological material provide clues about production and redistribution. It is possible to use these patterns to make further comments not only on the nature of social organization but also social transformations in the past. Using this approach, archaeological investigation has the potential to teach us more about the social and economic contexts within which minerals were produced. This line of research may increase our understanding of economic growth in the past and the emergence of socially ranked societies in the region.

1.2 The physical context: a regional spectrum of resources

The geographical boundaries of modern Zimbabwe are the Zambezi River to the north, the mountains which separate the country from Mozambique to the east, the Limpopo River to the South and the arid Kalahari sand veld which distinguishes Zimbabwe's relatively moist climate from the prevalent dry conditions in Botswana and Namibia to the west. In view of the natural topographical boundaries it is feasible to take the modern extent of Zimbabwe as a spatial framework for historical research although in prehistory, communities on the plateau and in adjacent valleys were interconnected with societies beyond these boundaries. The term "Zambezia" has sometimes been used to apply to the general region in the vicinity of the Zambezi and Limpopo Rivers, and is a useful concept when considering the area in history and prehistory.

The major economic mineral deposits in Zimbabwe are in metamorphic rocks which formed during the Archaean period. Mineralization with a wide range of precious and base metals was associated with the subsequent formation of a matrix of granitic and gneissic rocks around the metamorphic rocks. Together, these metamorphic and igneous rocks form the Basement Complex, which constitutes the highveld plateau stretching across the country from north-east to south-west. The plateau divides the country's watershed between the Zambezi River to the north and north-west and the Limpopo and Save Rivers to the south and south-east. Younger, sedimentary rocks form these major river valleys.

A large proportion of the plateau is higher than 1000 metres. Some parts towards the north-east rise to more than 1500 metres in altitude and the mountain ranges in the eastern highlands rise to between 1800 and 2400 metres. The high altitude of the north-east has a considerable cooling effect on the tropical climate and temperatures are usually comfortable and attractive to human settlement. In contrast, the south and south-east lowveld, dipping to the Limpopo and Save Rivers, and the Zambezi Valley in the north, experience high temperatures and limited rainfall.

Situated between 15° and 23° south, Zimbabwe lies within the tropical, summer rainfall zone. Rain falls during the warm months from November to April, and the cold months from June to August are dry. Mean annual rainfall recorded in the twentieth century showed that the north-eastern part of the plateau received between 800 and 1200 mm of rain

annually, on average. Much of Zimbabwe received 500 to 800 mm as an annual average. The Shashe-Limpopo Basin in the south and Save River valley in the south-east recorded less than 500 mm of rainfall annually (map of Mean Annual Rainfall, Zimbabwe Department of Meteorological Services, 1984, scale 1: 2 500 000).

Much of the summer rainfall region of south-eastern Africa is conducive to the production of traditional sorghum and millet cereal crops which have minimum moisture and temperature requirements during their growing season. Mitchell (2002: 259-60) illustrates the climatic limits to cereal cultivation in southern Africa, explaining why the archaeological record is divided between metalworking, mixed farmers in the east and pastoralists in the west. In view of the minimum moisture requirements, the area of Zimbabwe which is most suited to successful production of traditional cereals, relying on rain-fed cultivation, is a band across the north-east of the plateau (Sinclair 1987: 46; Huffman 1996a).

The highest agricultural activity using modern mechanization has been on the red, clay soils derived from the metamorphic rock formations of the northern gold belts. However, subsistence farmers appear to have preferred lighter, sandy soils derived from granite and gneiss, because their hand-held hoes were more effective on these soils. The combination of soil and rainfall on the plateau yield the most suitable areas for intensive agricultural production. Until recently, most of the archaeological sites recorded in Zimbabwe were situated on the plateau. However, archaeological surveys during the past decade or so have identified a substantial number of sites in low-lying areas which previously were not considered conducive to human settlement, agriculture or livestock-raising (Pwiti 1996; Manyanga 2000; 2006; Thorp 2005). Nonetheless the plateau is the optimal area for successful agricultural production and communities in the lower altitudes faced increased environmental uncertainty.

Mineral resources have a diverse distribution and many do not coincide with areas of optimal agricultural potential. Substantial sources of iron ore are banded iron formations associated with the Archaean rocks of the Basement Complex on the plateau, but other sources of higher-grade haematite and magnetite exist. Copper occurs in the Basement Complex but is principally found, sometimes in combination with gold, in two sedimentary basins which formed during the Proterozoic. These lie along the north-western fringe of the plateau and in the Save River valley.

Sources of red ochre and specularite, used as pigments, must have been widespread. Archaeological studies of specific ochre and specularite resources in South Africa and Botswana (Mitchell 2002) do not have any parallels in Zimbabwe. The same is true of talc schist or soapstone, used for carving a variety of implements and ornaments. An important subsistence commodity was salt. Where possible, salt was collected from springs such as those in the Zambezi Valley (Garlake 1973), the Save Valley (Sinclair 1987) and on the Mafungabusi Plateau (Mutema 1996; Swan 2001).

1.3 The research topic

The thesis studies the scale and importance of mineral production and metal products to various societies in the Zimbabwe past, and thus makes inferences about economic organization. A broad geographical scale is emphasized but specific chronological phases are defined in order to achieve a diachronic reflection on past economies. Sections 1 to 5 provide a comprehensive summary to the data and interpretations presented in four, published research papers. These case studies are included as photocopies following the comprehensive summary.

Sections 1 and 2 of the comprehensive summary reiterate and extend the background to the topics presented in the published papers. Section 2.1 outlines the evidence for processing of minerals in prehistory and 2.2 describes constraints which afflict traditional agriculture. 2.3 sets out the period under consideration, defines phases of social change and episodes of apparent social balance in Zimbabwean prehistory from the fifth century to the mid second millennium AD, and 2.4 summarizes existing explanations for social change in southern and central Africa.

Sections 3 and 4 present the combined conclusions drawn from the published papers. Section 3 uses the research results to address the question of changing social organization. Section 3.2 details the evidence for human responses to environmental constraints on traditional agriculture then 3.3 shows how the research papers amplify the interpretation of the social context of production; of mineral production in particular. Section 4 is a synopsis of the conclusions drawn and offers suggestions for future perspectives.

The research presented in the published papers investigates several mineral production sites as well as artifacts and documents in the collections of the Zimbabwe Museum of Human Sciences. The papers set out the history of iron and copper working in Zimbabwean prehistory and the changing patterns

in the scale of production. The question of whether production was at subsistence level or whether surplus was produced for trade is fundamental.

Paper 1 (Swan 2003) explores whether iron-smelting in Zimbabwean prehistory was conducted on such a large scale as to have a significant impact on the environment, as it has in other parts of Africa where political centres are recognized. In so-doing, the paper sets out a synthesis of the scale of iron-working in the Zimbabwean archaeological record.

Paper 2 (Swan 2007a) reports on excavations at two iron-smelting sites in the semi-arid lowveld of the south-east, where magnetite was used as a source of high grade iron ore. The socio-cultural context of each site is investigated in detail and the question of surplus production is considered. Subsistence strategies are described for the earlier of the two sites where evidence for settlement accompanies the smelting remains. A history of iron-working in Zimbabwe is outlined.

Paper 3 (Swan 2002) reports on excavations of a large archaeological copper extraction site in north-western Zimbabwe. As a background to the study, the history of copper-working in Zimbabwean archaeology is recounted. The socio-cultural context of exploitation of the mine during different periods is explored.

The study of Zimbabwe's copper ingots which is set out in Paper 4 (Swan 2007b) places the artifacts within different chronological phases and highlights their changing economic and ideological roles. The ingots are a useful indicator of the multiple roles of metal, and copper in particular, in early, politically complex societies.

All of these papers contribute to reconstructing the overall socio-economic context of metal production in the Zimbabwean archaeological record. Using these and other data sources, the research explores the socio-economic contexts within which mineral production operated. Viewed in the context of inherent environmental uncertainty, the ideas contribute to the ongoing debate about the emergence and continuity of stratified societies in Zimbabwean prehistory, and the extent to which metal production contributed to patterns of changing social organization from the mid-first to the mid-second millennium AD.

2. The archaeological, environmental and intellectual setting

2.1 Processes of mineral production in Zimbabwean prehistory: an overview

The evidence for vigorous prehistoric exploitation of auriferous deposits in Zimbabwe is unique in southern Africa (Swan 1994). The archaeological context of gold working in Zimbabwean prehistory is now quite well understood (Summers 1969; Swan 1994). Most gold resources showed signs of having been mined before the colonial era and some mines contained archaeological material. Gold was separated by crushing auriferous rocks then washing the finely ground sands in a pan; by virtue of its weight the gold would form a tail in the base of the pan. The activity of reducing gold ore formed deep, circular grinding hollows on rock outcrops throughout Zimbabwe, particularly in gold mining areas (Swan 1996), and, in view of the location of these activity sites, was obviously the work of the mining communities themselves. The next stage in the process was to melt the separated gold, which seems to have been done in an open potsherd that served as a crucible, and then pour the molten metal it into a mould. The latter activity was confined almost entirely to elite sites of the Zimbabwe Tradition. Gold artifacts and evidence for gold working have been found in a number of elite sites on the Zimbabwean plateau and in the Limpopo Valley.

Patterns of production, trade and consumption of gold differed from those of copper and iron. Copper and gold were both mined from underground or open stopes but gold was extracted on a far wider scale than copper. This contrasts with Zambia where numerous early copper mines were found on the rich deposits of the Central African Copperbelt. Iron ore, on the other hand, was collected from the ground surface or quarried from shallow pits. Usable deposits are found throughout Zimbabwe.

Unlike gold, copper and iron were smelted in furnaces to extract metal, usually from oxide and carbonate ores. Copper production has hardly been examined at all in the context of Zimbabwean prehistory although information about copper extraction was included in Summers' (1969) analysis of gold mining. Few copper smelting sites have been identified. Some places identified as iron smelting sites may actually have produced copper (van der Merwe 1978).

Ingot moulds and crucibles, found at sites scattered throughout the country, indicate that copper metallurgy was widespread. A number of copper bangles, beads, rings, pendants and, occasionally, domestic tools have been found on archaeological settlements and burial sites, whereas gold artifacts are few and much of the gold extracted from Zimbabwean mines in the distant past was seemingly exported via the east coast. The role of copper in early Zimbabwean complex societies deserves a particular focus. In view of its prestige value, copper in the archaeological record was a status commodity associated with relative wealth and social ranking. It was not essential to fundamental subsistence or survival. Although copper has always operated in the prestige sphere, the research done here shows that copper was produced in some quantities from an early date. Beach (1977) treated copper as an export commodity and did not treat it as an important branch of production in the Zimbabwean past, probably because of the limited archaeological research on local consumption of copper. Herbert (1984) has emphasized the prestigious role of copper in African society as a whole and Bisson showed that copper was an important symbol for African society in central Africa before prestigious glass beads were imported. He emphasized that copper production increased in response to local demand before the advent of luxuries from the coast and refuted ideas that external trade had stimulated the development of complex societies on the Central African Copperbelt (Bisson 1976). The circulation of copper ingots of standard shape, size and weight during certain periods suggests their use as currency for local purposes. Copper was treasured by African society and its distribution in archaeological contexts is much more common than gold. Studies of copper production and distribution, therefore, offer a means of exploring social exchanges and relationships in early complex societies.

Evidence for iron smelting in the form of furnace remains, tuyere sherds and slag is so abundant that it seems almost every settlement may have produced implements for its own use. Suitable sources of iron ore would have placed some restrictions on the geographical distribution of smelting sites. Specialist craftspeople, *nyanzvi*, who bartered a range of necessary commodities, included iron-workers (Mudenge 1988: 13). However, ores that were used ranged in

quality and some were traded. For example, ore from Hwedza, in Mbire territory, was acquired by Njanja smelters, through diplomatic alliances with the Mbire (Mackenzie 1975). High-grade haematite and magnetite deposits occur in relatively restricted locations and some of these were used on a large scale in prehistory (Prendergast 1974; Mennell and Summers 1955). Fabrication of iron differed again from other metals. Whereas molten copper was cast, iron was wrought from a solid state into tools, weapons and occasionally into jewellery.

Investigations of iron production have addressed essential questions such as how and where smelting originated; they have examined smelting and forging techniques and the importance of the metaphorical perceptions of smelting processes among many sub-Saharan African societies before the decline of traditional iron-smelting during early colonial times. Iron can be considered a subsistence necessity among farming communities as it was manufactured primarily into utilitarian items. The lack of research attention to the social distribution and organization of iron working may stem from the observation that most archaeological settlements appear to have some evidence for iron production, and that production was likely at subsistence level. Iron ore sources of varying quality are widespread and each community was thought to have included a specialist metalworker who supplied the group's own requirements (Prendergast 1974). Ethnographic and historical examples of larger scale iron producers such as the Njanja (MacKenzie 1975; Chirikure 2007) are perhaps thought to have been unusual and recent adaptations to political circumstances, but it is worth considering whether different systems of organization and control of iron production were in place in the more distant past.

Salt could be extracted from particular shrubs or from salt-rich soils but salt extraction from springs in Chireya and Chizarira has been recorded (Mutema 1996; Swan 2001). At Chireya, saline soil was washed and filtered through large clay containers. The dissolved saline solution was collected in pots, evaporated by boiling over the fireplace then spread in the sun to dry (Mutema 1996). Salt deposits such as those at Chisekera appear to have attracted the earliest farmers to the dry south-eastern lowveld because early pottery was found in association with these deposits (Sinclair 1987: 134).

2.2 The forces of nature: an unpredictable environment for agriculture

Agriculture was the mainstay of the traditional economy of most of the Zambezi population. Prevailing subsistence farming practices, in addition to oral traditions and historical documents, are the basis for a reconstruction of agriculture in prehistory. Millets were crushed and cooked to make *sadza* which provided the staple diet. Other cereals as well as roots and a wide variety of vegetables were grown as a relish which was eaten together with *sadza*. After they had been harvested, crops were dried, threshed and stored in airtight granaries to provide a food source until the next harvest. Millet could be stored for two or three years if kept dry, and sorghum for longer (Beach 1977).

There were often serious constraints to successful harvest, however. Over much of the plateau, annual rainfall and temperatures were sufficient to successfully harvest traditional crops. Millets require a minimum of 350 mm spread over 50 days. Sorghum also requires a minimum of 350 mm, spread over 75 days. Consequently, the annual rainfall requirement is about 500 mm (Huffman 1996a). Below the highveld plateau, mean annual rainfall over much of Zimbabwe in recorded history is less than 700 mm, decreasing south-westwards to less than 400 mm in the Shashi-Limpopo Basin. Consequently, much of Zambezia has limited suitability for rain-fed crop production, as rainfall is often insufficient to meet the minimum moisture requirements, even of relatively drought-resistant traditional cereals.

More importantly, variability in the regional rainfall patterns imposes a serious constraint. Rainfall is renowned for its inconsistency (Beach 1977; Sinclair 1987: 40-42) and varies considerably from the average. Widespread or localized droughts have been an inherent part of Zimbabwe's climatic patterns during recorded history (Manyanga 2006). Without irrigation, crops are affected not only by low rainfall, but also by rains which come too early or too late in the growing season. Crops could fail to reach maturity in years of subnormal rainfall, which could occur frequently, or if rainfall did not come at the time when crops most required. Rainfall was only one of the problems that could beset agriculturists. Locust plagues, frost or floods could be disastrous (Beach 1977).

A further difficulty which communities were compelled to face during the period reviewed in this

study is that climatic conditions have fluctuated between phases when it has been wetter or drier than it is at present, with changes taking place rapidly and lasting decades or even centuries (Repinski et al 1999; Lee-Thorp et al 2001; Mayewski et al 2004). Results from a variety of studies have enabled reconstructions of past climates in southern Africa. Sources of high-resolution data include the isotope record in a speleothem from Congo Cave in the southern coastal region of South Africa, ocean sediment cores from the Namibian coast, the pollen record from the South African highveld (Tyson 1999) and stable oxygen and carbon isotopes in annual growth layers in stalagmites from Cold Air Cave on the South African highveld (Repinski et al 1999; Holmgren et al 1999; Tyson et al 2000; Lee-Thorp et al 2001; Finch et al 2001; Tyson et al 2002; Holmgren et al 2003; Finch et al 2003). Data with a lower resolution was obtained from mollusc shells at the Cape, pollen analysis of Hyrax middens on the highveld and tree ring data from KwaZulu-Natal and the Cape. In addition, a number of point observations at various sites in South Africa, Namibia and Malawi contributed to the picture (Tyson 1999). In general, cool periods were longer and warm periods shorter in the temperate south whilst the opposite was true for the tropical north of the region, reflecting an oscillation tied to the "expansion and contraction of the circumpolar vortex associated with the changing meridional temperature gradient between the South Pole and the equator" (Tyson 1999). Scholars acknowledge that these changes had an impact on agriculturists in prehistory. For example, an inverse relationship in the variability in climatic conditions of equatorial East Africa and subtropical southern Africa prompted a suggestion that agriculturists, influenced by changes in rainfall patterns, moved southward in the early second millennium AD (Tyson et al 2002).

Tyson & Lindesay (1992) noted a cooler period in southern Africa from about 100 to 200 AD, a warmer period from about 250 to 600 AD and a cooler phase from 600 to 900 AD. More recently, Tyson (1999) dates the earlier cool period from 2350 BP to 1950 BP with the subsequent warmer phase from 1950 BP to 1600 BP. Holmgren et al (1999) agree that the most prolonged warm, wet phase took place during the first four centuries of the first millennium AD. A comparison with data from archaeological sites showed that expansion and retreat of human settlements were in broad agreement with the temperature and rainfall patterns in the climate model, and that the initial establishment of mixed farming in northern South Africa and south-eastern Botswana appeared to have taken place during a wetter phase from around 500 to

700 AD (Tyson & Lindesay 1992; Huffman 1996a). At Malilangwe, in the semi-arid south-eastern Zimbabwean lowveld, early agriculturist settlement between 530 and 720 AD corresponds with the climatic evidence for a wetter period (Thorp 2005).

The lack of ninth and early tenth century sites found by the Malilangwe survey (Thorp 2005) and in the Limpopo Valley during the eighth and ninth centuries (Vogel 2000) corresponds with a cool period from 600 to 900 AD (Tyson & Lindesay 1992). Observations of environmental conditions near Chibueni in southern, coastal Mozambique recorded a relatively dry period from around 530 AD to about 1000 AD, when freshwater lake sediments accumulated slowly and pollen of savanna vegetation, associated with dry phases, dominated. An extremely dry phase around 900 AD was noted.

There seems to be general agreement that the effects of the well known Medieval Warm Epoch from about 900 to 1300 AD and the Little Ice Age between about 1300 and 1800 AD were felt in southern Africa (Tyson & Lindesay 1992; Tyson 1999; Holmgren et al 1999; Tyson et al 2000; Mayewski et al 2004). Zhizo pottery shows expansion of settlements onto the edge of the Kalahari Desert and into the dry Limpopo Valley in the late ninth or tenth century (Huffman 1996a). Thorp (2005) records occupation of HlambaMlonga during the Gumanye (and perhaps K2) phase around 1000 AD, as well as other Gumanye period sites in the semi-arid Malilangwe study area. Zimbabwe period 3 occupation of Malilangwe during the mid to late thirteenth century probably took place during a wetter phase, as several settlements were located close to springs which in the twentieth century were sometimes dry during drought years. A period of higher rainfall and dominance of closed canopy forest species, identified at Chibueni, lasted from 1000 to 1200 AD, with a short lowering of rainfall levels around 1100 AD (Ekblom 2004).

The wet phase associated with the Medieval Warm Epoch appears to have continued until the end of the thirteenth century, when a generally cool, dry phase which lasted from the fourteenth to the eighteenth centuries is interpreted as a regional expression of the Little Ice Age (Tyson & Lindesay 1992; Huffman 1996a; Holmgren et al 1999; Mayewski et al 2004). There appears to have been a certain amount of regional variation. The Chibueni area entered a dry phase after 1200 AD, although there was a wet phase and increase in closed canopy forest at some time during the fourteenth century. Occupation of HlambaMlonga at Malilangwe continued into the fourteenth century, contemporary with the princi-

pal phase of Great Zimbabwe's economic prosperity. Thorp relates both the Zimbabwe period 3 and period 4 occupations to a wet phase which lasted until the mid-fifteenth century identified by multi-stable isotope analysis of domestic fauna from the Shashe-Limpopo Valley (Smith 2005). Smith's data identified an interruption of the wet phase, from about 1200 to 1250, which may coincide with the drying of the climate noted at the coast around 1200 (Ekblom 2004).

The upper parts of the Chibueni cores yielded little data but suggested that lake levels after 1200 AD were low and probably dry at times, increasing again after 1850 AD. Settlement at Malilangwe was sparse between the fifteenth and eighteenth centuries. The Little Ice Age continued from about 1675 to 1810 AD with the coldest period around 1700 AD (Tyson 1999; Holmgren et al 1999). A warm spell around 1500 to 1675 AD (Tyson and Lindsey 1992) apparently facilitated mixed farming settlements in the cold, dry Free State in South Africa in the sixteenth century (Huffman 1996a). However, a study of carbon isotope content of the growth of tree radii showed that drier conditions were experienced in the north of South Africa in the 1500s (Norström et al 2005). The high resolution results achieved by this study demonstrated rainfall patterns from the early 1400s to the late 1900s which were in general accordance with the phases outlined by Tyson & Lindsey (1992), except that they showed the dry conditions of the eighteenth century continuing until a major wet spell around 1875 AD. Tree ring data from Natal recorded high rainfall in the late eighteenth century, and the archaeological data for this period suggested widespread adoption of maize, which has higher moisture requirements than traditional crops. This, in addition to inferred population increase, corroborated the observation of higher rainfall between 1790 and 1810 (Huffman 1996a). A more detailed resolution from historical records documents severe droughts and political instability over much of southern Africa at certain points in the late eighteenth and early nineteenth centuries, with a period of relatively moist conditions throughout the region returning only in the late 1970s (Manyanga 2006). Strategies which were used for managing environmental uncertainties are discussed in section 3.2.

Results of studies from throughout southern Africa corroborate well with each other, showing that general trends were widespread, some phases such as the Medieval Warm Epoch and the Little Ice Age recognized at a global scale, whilst at other scales regional differences occurred. The overall picture of

human responses to environmental change continues to take shape as localized archaeological survey work in liaison with palaeo-environmental studies amplifies more chronological and geographical specifics. At present, the imprecision of archaeological dating methods and generalized characterization of climatic fluctuations enable observations at a broad scale for much of the summer rainfall area of southern Africa.

2.3 Signs of the times: patterns of social and political change in southern African prehistory

The chronological frame for the past two thousand years of Zimbabwean culture-history (eg Sinclair 1987; Swan 1994; Pwiti 1996; Mitchell 2002) relies largely on several papers (Huffman 1971; 1974; 1978a) which focused on ceramic analysis. These identified group origins and dynamics, and emphasized the changes in ceramics at the end of the transition from the Early to the Late Iron Age, outlined below. A handful of absolute dates for each of the ceramic phases and associated material culture renders this framework an essential background to defining the phases of social change in Zimbabwean prehistory. The question of whether changes in ceramics reflect a continuum of cultural change, or periods of transition between phases of stability, has been discussed (Hall 1983; Huffman 1983), but as new data is added and chrono-stratigraphic frames are redefined, the concept of ceramic phases that last for several centuries are likely to tend towards a more continuous model. Ceramics are a convenient medium for identifying a general chronology and regional association. For example, at any particular site, ceramics are examined as a first step in assessing the site's place in prehistory. Having achieved this, further information about political and economic organization can be achieved by placing an emphasis on other aspects of material culture. Studies of social change in the past can be approached by examining such criteria as settlement distribution, settlement hierarchy, typical settlement location, intra-site settlement arrangement, architecture, burial methods, technology and scales of production and trade.

Conventionally, Zimbabwean prehistory has been viewed in terms of two periods. The first comprises an "Early Iron Age" or period of "Early Farming Communities" in the first millennium AD, when agriculture was first practiced, early farmers expanded into south-eastern Africa and remained relatively egalitarian. During the "Late Iron Age" or "Later Farming

Community" period, the second millennium AD witnessed an initial change in pottery styles, increase in cattle husbandry and subsequently the development of political hierarchies which have been defined in terms of "chiefdoms" and "states".

Adjustments to this conventional view have been suggested. Following trends in South African archaeology which recognize social changes at the beginning of the second millennium AD (Whitelaw 1997), Chirikure (2007) incorporates the concept of a "Middle Iron Age" from the early second millennium to the thirteenth century, leading eventually to political organizations which have been termed "states" by the "Late Iron Age", which he says began in the fourteenth century.

However, social changes were already taking place during the late first millennium AD. It becomes obvious that when assessing the evidence for processes of social transformations it is useful to make reference to a chronological basis which has as high a resolution as possible. Thus, in his spatial analysis of archaeological sites in Zimbabwe and Mozambique, Sinclair (1987: 120) included the full range of chronological phases identified by Huffman's ceramic typology, which permitted him to examine six or seven sets of archaeological sites defined in time and space. His holistic approach to the geographical and chronological distribution of archaeological sites led him to distinguish five developmental phases (Sinclair 1987: 160-161). The first phase was a time when scattered farming communities left no evidence for external trade connections or of social hierarchy. They were probably organized along the lines of the segmentary model defined by Friedman and Rowlands (1977). In the second phase, external trade was introduced in about the seventh century AD and society began to produce goods which had exchange value. Settlements expanded into more marginal areas. In the ninth century the beginning of a third phase was identified by an increase in the volume of external trade and settlements which showed signs of social hierarchies. The fourth was a phase of state-level political organization with the urban centre at Great Zimbabwe becoming a focus for rapid change. Elite settlements extended over a wide area. A fifth phase in the later second millennium saw the end of Great Zimbabwe's importance and the emergence of the Khami and Mutapa states. With a focus on trade and politics, Pwiti (1991; 2005) reiterated the first four of Sinclair's five phases as a commentary on the importance of trade in the stages of social development which culminated in the Zimbabwe state.

Swan's (1994) attempt to build on the spatial dis-

tribution of sites produced maps of archaeological settlements for each of six periods. Overlaps in dates between several phases were acknowledged. Among several points raised, this exercise highlighted a temporal difference in transition to ceramic forms associated with the "Late Iron Age", which took place in the north one or two centuries later than it did in the south, thus questioning the validity of this temporal distinction.

Signs of developing political complexity take various forms in different parts of southern Africa from the eighth century onward. Settlement data is a useful means of reconstructing social organization and can be used to trace the emergence of the first signs and follow the stages of social change. With attention on settlement data, the following sections describe four stages of economic and political change during the past two millennia of southern African prehistory. Information about mineral production and trade during each of the chronological phases is set out in section 3.3, incorporating the data presented in the research papers.

Sets of radiocarbon dates are given for each of the stages outlined below. Aiming at a standard presentation, all of the dates listed here are calibrated as far as possible, where BP dates are available, using the Pretoria Radiocarbon Calibration software, version 1.02, which incorporates data adapted in 1988 and 1993 for the southern hemisphere.

2.3.1 The introduction of farming and metalworking – fifth to seventh centuries

The earliest evidence for farming and metalworking in southern Africa is on the east coast. On the coast of southern Mozambique, pottery was found in association with iron-smelting slag, animal bone and middens of marine shells in sites dating between the first and third centuries AD (Morais 1988). Enkwazini and Mzonjani on the KwaZulu-Natal coast represent the extension of iron-working into South Africa by the third to fourth century AD. Copper and iron ores in the vicinity of Broederstroom in the Northern Province of South Africa were utilized between the fourth and seventh centuries (Maggs & Whitelaw 1991). As outlined above, the south-west coast is arid and unsuitable for traditional farming settlement but further north, settled communities who manufactured iron tools and weapons were established on the Congo coast by the second century AD (Denbow 1990).

Inland, farming and metalworking appear to have expanded into Zambezia at some time between the

Site	Lab number	BP date	Cal AD date
Ziwa 1 grave	SR-17	1650 ± 100	348(428)557
Zimbabwe Hill	M-913	1630 ± 150	264-291,322(438)631
Cighwa	SR-119	1540 ± 95	435(567)648
Gokomere Tunnel	SR-26	1420 ± 120	567(657)766
Kinsale	SR-117	1410 ± 95	611(661)711
Mabveni	SR-43	1770 ± 120	141(331)428
Mabveni	SR-79	1380 ± 110	624(672)780
Kadzi Tr 1 Layer 5	Ua 4106	1475 ± 70	562(634)662
Kadzi Tr 1 Layer 4	Ua 4105	1445 ± 80	591(648)678
Kadzi Tr 1 Layer 4	Ua 4104	1410 ± 80	624(661)697
Kwali Camp	Beta-200558	1490 ± 60	530(580)640
Kwali Camp	Beta-200556	1240 ± 70	690(780)880
Kwali Camp	Beta-200557	1310 ± 40	670(690)720,740-760

Table 1: Calibrated radiocarbon dates for the introduction of farming and metalworking

fifth and the seventh century AD. The earliest evidence for change in the earlier forager subsistence base in the region, is for the introduction of domesticated livestock and pottery technology among stone-tool-using communities, associated with the Bambata archaeological Tradition. This dates around the first to the third century AD in north-central Botswana (Reid et al 1998) and to the second to mid-first century BC at Bambata Cave in south-western Zimbabwe (Walker 1983). Whether the Tradition represents settled farmers, transient herders, or foragers who had adopted domesticated livestock is still disputed. The early date from Zimbabwe Hill and the earlier date from Mabveni (Table 1) from contexts containing pottery have been assigned to the Bambata Tradition (Huffman 1980). The Ziwa 1 date (Table 1) is seldom used as it derived from a burial (Summers 1969: 124). When calibrated, these early dates from Zimbabwe Hill, Mabveni and the Ziwa 1 burial are not unreasonably early (Table 1). It is at least certain that ceramics were introduced to Zimbabwe by the fourth century, and farming and metalworking by the sixth century. Cereal crops were found in a sixth century context at Kadzi (Pwiti 1996), metal artefacts dated in the sixth century at Cighwa Hill (Robinson 1967), iron smelting and iron blade fragments at Kwali Camp dated in the sixth century (Paper 2, Swan 2007a) and iron and copper working was evident in a mid-seventh century context at the Gokomere Tunnel site (Robinson 1963).

The first farming communities in southern Africa may have actively sought sources of suitable metal ores because the presence of iron ore resources appears to have influenced selection of settlement loca-

tion on the coasts of Mozambique and KwaZulu-Natal (Maggs & Whitelaw 1991; Mitchell & Whitelaw 2005) and the continued early farming settlement of South Africa (Klapwijk & Huffman 1996; Whitelaw & Moon 1996).

Considering a potential association between metal resources and early farming settlements, comparison between the geographical distribution of iron ore sources and early farming sites in Zimbabwe generated some interesting observations. The major sources of iron ore are banded ironstone and banded ferruginous quartzite, which occur in the schist belts of the early Precambrian geological systems on the Zimbabwean plateau (Prendergast 1974; Provisional Geological Map of Rhodesia, 1977, scale 1:1 000 000, published by the Rhodesia Geological Survey). Overlaying a map of archaeological sites with the earliest pottery (Swan 1994: 47) onto the geological map showed a correlation between the schist belts and first phase of the early farming sites. Many of the sites were located around the edges of these geological formations. It appears that early farmers sought areas with easily tilled soils in the surrounding granite formations (Sinclair 1987: 135), although they also had access to iron ore resources in nearby geological formations such as banded ironstones associated with the mineral belts. A substantial source of iron ore was probably as important a factor for early farmers as arable land, pasture and perennial water supply.

Very little is known about the social organization of the earliest farmers in the region. Based on settlement size, political ranking may have existed among Early Farming Communities on the Congo coast by the beginning of the first millennium AD (Denbow

1990). Broederstroom and Riverside in South Africa are thought to have been organized according to the Central Cattle Pattern in the sixth century (Huffman 1998). If this was the case, and if the ideology which is associated with the Central Cattle Pattern in ethnographic cases was present among early farmers, it could have led to social differentiation. Alternatively, it has been suggested that potential social class development may have been kept in check by ideology which reinforced social equality (Pwiti 2004). Settlements were on the whole very large, often more than 2 hectares (Huffman 1978b) and sometimes even more extensive (Pikirayi 2002), which would, in itself, imply the necessity for centrally-organized conflict resolution (Pikirayi 2001).

2.3.2 The beginning of economic expansion – eighth to tenth centuries

Once farming was well established as the subsistence strategy in much of southern Africa, a variety of evidence suggests that complex social systems began to develop between the eighth and tenth centuries AD. The concept of a class system seems to have formed in the region during this period. A clear, three-tier settlement hierarchy reflected a social class system in the Toutswe Tradition, in east-central Botswana, from the ninth to the thirteenth century. It was rooted in an emphasis on pastoralism from the sixth century (Denbow 1986). Long term occupation on at least

two hilltop settlements, Taukome and Bosutswe, began in the eighth century. Schroda, in the Limpopo Valley, may also have been the capital of a three-level political hierarchy in the tenth century, in view of its large size when compared with other Zhizo sites (Huffman 2000). Some Zhizo sites in north-eastern Botswana were situated on hilltops. They did not have any stone walling, but had substantial animal kraal deposits, like Schroda, indicating cattle wealth (van Waarden 1998).

There is sufficient evidence to demonstrate the Central Cattle Pattern form of settlement arrangement in later first millennium sites, particularly the Toutswe Tradition site of Kgaswe B-55, but also at Schroda. By implication, the ideological concepts associated with the settlement plan could have formed the basis for certain families to accumulate cattle wealth and political allegiances. Within Zimbabwe, centrally-positioned white zones in Zhizo levels at Makuru and Leopard's Kopje Main Kraal may have been the remains of animal dung (Huffman 1984a), but these deposits were relatively thin and did not match the evidence for cattle wealth found at Schroda. Elements of the Central Cattle Pattern dating between the eighth and tenth centuries have been exposed in KwaZulu-Natal at Nanda and KwaGandaganda (Whitelaw 1993; 1994). On the grounds of settlement size and evidence for centralized activities and trade within the men's assembly area, including surplus ivory production, a hierarchy probably ex-

Site	Lab number	BP date	Cal AD date
Leopard's Kopje Main Kraal Zhizo phase	SR-225	1280 ± 90	676(775)890
LKMK Zhizo phase	SR-55	1250 ± 110	680(793)971
LKMK Zhizo phase	I-4862	1130 ± 95	873(977)1021
Makuru	N-1275	1260 ± 65	701(785)888
Mawala Hill Zhizo phase	Pta-3305	1080 ± 50	977(1002)1023
Mawala Hill Zhizo phase	Pta-3307	1100 ± 50	963(992)1015
Mawala Hill Zhizo phase	Pta-3308	1070 ± 50	982(1007)1026
Thabazikamambo Zhizo phase	SR-68	1080 ± 100	895(1002)1042
Kadzi Tr 1 Layer 3	Ua 3195	1290 ± 50	691(771)811,847-851
Coronation Park Coronation level	N-978	1240 ± 100	691(811,847,851)971
Chinhoyi Caves	SR-118	1300 ± 95	666(766)884
NaBa	Pta-1193	1260 ± 50	716-744, 759(785)881

Table 2: Calibrated dates for the second phase of Early Farming Communities, associated with the beginning of social complexity

isted among settlements from the seventh century in KwaZulu-Natal, and KwaGandaganda has been interpreted as a political centre (Whitelaw 1994-95).

In the context of the initial emergence of social ranking evident in these settlement patterns, a variety of resources throughout southern Africa were exploited for exchange, sometimes over relatively long distances. In addition, some societies appear to have capitalized on their geographical position with relation to resources and trade routes, and adopted the role of intermediaries in the redistribution of trade goods. Geographically restricted natural resources such as fish, salt, graphite, soapstone, copper and iron appear to have prompted exchange networks in these commodities (Denbow 1999).

The practice of long distance exchange and a de-

mand for prestige goods demonstrate the production of a surplus for exchange. Glass beads acquired over long distance exchanges have been found in later first millennium sites on the Zimbabwean plateau (Whitely 1958; Summers 1958: 45-6, 94; Huffman 1974: 75; Wood 2000). This would imply that ivory, gold or other commodities were exported from Zimbabwe earlier than neighbouring areas such as the Limpopo Valley.

2.3.3 The rise of social hierarchies – early second millennium AD

A set of cultural and economic transitions distinguish the first centuries of the second millennium from the first millennium, although, as pointed out above,

Site	Lab number	BP date	Cal AD date
Coronation Park Maxton phase	N-979	970 ± 100	1007(1047,1097,1136)1217
Chitope	SR-163	840 ± 95	1208-1171,1164(1190, 1248)1287
Kadzi Tr 1 Layer 2 Chitope phase	Ua 3194	990 ± 50	1019(1037)1162
Kadzi Tr 4 Layer 4	Ua 4107	810 ± 70	1210(1266)1288
Carrick Creagh Harare burial	Pta-965	825 ± 45	1217(1259)1277
Graniteside	GRN-2341	680 ± 60	1288(1304)1400
Graniteside	Y-722	670 ± 100	1280(1308,1367,1379)1414
Gadzema Harare burial	SR-125	470 ± 120	1412(1451)1637
Welston Harare burial		880 ± 175	1013(1210)1297
Ruanga Musengezi phase	N-1147	775 ± 100	1214(1278)1306
Castle Kopje Harare phase		570 ± 200	1280(1414)1521,1576-1627
Castle Kopje Harare phase		670 ± 50	1293(1308,1367,1379)1400
Castle Kopje Harare phase		680 ± 70	1288(1304)1403
Mbagazewa	SR-100	680 ± 95	1278(1304)1410
Mbagazewa	SR-101	665 ± 95	1283(1310,1362,1383)1414
Wazi Hill	St-11521	700 ± 135	1253(1298)1416
Wazi Hill	St-11525	640 ± 70	1296(1322,1346,1393)1414
Wazi Hill	St-11523	560 ± 360	1175(1417)1678,1748-1804
Wazi Hill	St-11524	930 ± 265	888(1167)1310,1362-1383
Wazi Hill	St 11522	400 ± 110	1433(1498)1652
Wazi Hill B	St 10946	364 ± 135	1436(1523,1566,1629)1670, 1780-1795

Table 3: Calibrated dates for the rise of social hierarchies in northern Zimbabwe – Maxton, Chitope, Harare and Musengezi phases

Site	Lab number	BP date	Cal AD date
Gweru Kopje	Pta-21441	1085 ± 40	979(1000)1017
Zimbabwe Hill Gumanye phase	M-914	875 ± 50	1024(1214)1292
Chivowa Hill	Pta-1919	960 ± 35	1035(1055,1086,1151)1171
Chivowa Hill	Pta-1979	940 ± 50	1037(1162)1202
Chivowa Hill	Pta-1922	865 ± 35	1193(1221)1256
Gumanye Hill	Pta-19162	930 ± 35	1051-1091,1147(1167)1198
HlambaMlonga Gumanye & K2 phase	Pta-9128	1030 ± 60	997(1033)1047,1096-1136
HlambaMlonga Gumanye & K2 phase	PTA-9120	1040 ± 40	1002(1019)1033
Nthabazingwe Mambo phase	SR-224	1105 ± 85	890(990)1026
Nthabazingwe Mambo phase	N-772	1050 ± 100	963(1015)1157
Nthabazingwe Mambo phase	SR-216	950 ± 50	1033(1157)1193
Nthabazingwe Mambo phase	SR-217	880 ± 60	1162(1210)1262
Nthabazingwe Mambo phase	SR-218	880 ± 80	1055-1086,1151(1210)1270
Mawala Hill Mambo phase	SR-134	860 ± 95	1016-1081,1154(1225)1281
Zhizo Hill Mambo phase	TX-228	910 ± 130	1019(1184)1277
Venzo Kopje Bambandyanalo site	SR-136	880 ± 90	1047-1097,1136(1210)1274
Woolandale	SR-44	640 ± 90	1291(1322,1346,1393)1421
Mapela Hill	SR-122	790 ± 95	1206(1274)1300
Mapela Hill	SR-115	670 ± 95	1281(1308,1367,1379)1413
Nali Hill Woolandale site?	Pta-3300	950 ± 50	1033(1157)1193
Nali Hill Woolandale site?	Pta-3301	970 ± 50	1026(1047,1097,1136)1175
Nali Hill Woolandale site?	Pta-3302	850 ± 50	1193(1236)1270
Nali Hill Woolandale site?	Pta-3304	1060 ± 50	987(1011)1030
Mtanye Mapunbugwe site	Pta-944	700 ± 40	1288(1298)1312,1358-1385

Table 4: Calibrated dates for the continued development of social hierarchies in southern Zimbabwe – Gumanye and (Leopard's Kopje) Mambo and Woolandale phases

some of these traits were already manifest from as long ago as the eighth century AD. In terms of settlement patterns, a move of some settlements to hill-top locations, first apparent in Botswana, occurred in neighbouring areas in the centuries that followed the establishment of the Toutswe Tradition. These developments must be significant in terms of changing worldviews at that time.

South of the Limpopo River, some of the sites of the Eiland Phase were on high ground around 1000 to 1200 AD, although pottery styles compared with

first millennium styles at other sites (Maggs 1984). Hilltop settlements dating from the eleventh and twelfth centuries AD are found in the Maxton Phase of north-eastern Zimbabwe and the Gumanye Phase of central and south-eastern Zimbabwe. Maxton pottery shows a close affinity with Gokomere Phase pottery of the first millennium and is interpreted as a late development of it. The Maxton type site is a large settlement which occupies the summit of a diorite hill within the Shamva gold belt. A low wall around the site could have served little purpose other

Site	Lab number	BP date	Cal AD date
Gilnockie furnace	GrA-9244	1010 ± 40	1015(1030)1047, 1097-1136
Surtic furnace	Pta-1842	945 ± 35	1042(1159)1184
Nenga furnace	Pta-1486	800 ± 50	1236(1270)1285

Table 5: Calibrated dates for iron-smelting furnaces

Site	Lab number	BP date	Cal AD date
Aboyne Mine	SR-53	780 ± 110	1202(1277)1308,1367-1379
Aboyne Mine	SR-58	650 ± 110	1283(1316,1352,1390)1424
Geelong Mine	SR-143	780 ± 95	1214(1277)1303
Copper Queen Mine	Pta-7828	870 ± 60	1167(1217)1266
Copper Queen Mine	Pta-8008	550 ± 40	1409(1421)1433
Copper Queen Mine	Pta-8460	660 ± 50	1296(1312,1358,1385)1403

Table 6: Calibrated dates for gold and copper mining

than to “demarcate the settlement” (Garlake 1967). Monoliths stand at intervals along the wall. Similar upright monoliths mounted on top of the Western Enclosure wall on the Hill Ruin at Great Zimbabwe were described as “horns of the king”. They were said to symbolize the king’s responsibility to defend his people (Huffman 1985). The wall around the Maxton settlement could have been intended to symbolize the prestige of the inhabitants.

Continuity from Early Farming Communities to the Musengezi Phase has been suggested on the several grounds (Pikirayi 1996; Pwiti 1996: 155–6). Although these did not include settlement patterns, a potential continuity from Maxton to Musengezi communities is interesting. Pwiti’s field research in northern Zimbabwe established a pattern among Musengezi settlements, ranking them into two sizes, with some on hilltops (Pwiti 1996: 158). Finds of both Maxton and Musengezi material at numerous sites has also been noted (Pikirayi 1996).

Conclusions about social ranking in the Musengezi community have been drawn on the basis of burial practices by re-examining burial data from the excavated site of Monk’s Kop or M’bagazewa in the light of Shona ethnography (Pwiti and Mahachi 1991). The site seems exceptional in terms of the number of individuals buried together and the grave goods, which included beads of glass, copper and shell, copper and iron bangles, sections of conus shells and numerous pots. Coloured glass beads numbered almost two thousand. Having been recognized among Musengezi burials, a pattern of ranking might also be proposed for the contemporary Harare Phase, situ-

ated immediately to the south of the Musengezi sites. With the exception of Harare pottery found in settlement contexts at Castle Kopje and Tsindi, the Harare community is known almost exclusively from burials. Graniteside was a cemetery with multiple burials, which were relatively well provided with grave goods. One exceptional grave contained three thousand glass beads. Although some glass beads were found in Harare graves at other sites, Graniteside differs, in terms of the number of graves, from all other known burials of the Harare Phase, where only one or two individuals or small family groups were interred.

Gumanye settlements in the eleventh century pre-date the Zimbabwe state in its core area of central and south-eastern Zimbabwe. They are not large but occupy hill summits and have high, stone, enclosure walls and terrace walls retaining lower occupation platforms (McDonald 1979; Sinclair 1991). Material culture from the excavated settlements suggests a range of craftwork, including metalworking, and access to trade networks (Sinclair 1991) but does not suggest a particular degree of wealth. Metalwork appears to have included gold production. A Gumanye occupation constitutes Period II on the Hill Ruin at Great Zimbabwe. Although stone walls enclosed other Gumanye settlements, a review of the chronology of Great Zimbabwe expressed the view that walling was not built at the site until the thirteenth century, when transitional ceramic styles suggest that the Gumanye Phase emulated the material culture of Mapungubwe (Huffman and Vogel 1991).

In the Limpopo Valley, K2 is acknowledged to have been the political centre of the surrounding region in

the eleventh and twelfth centuries in view of its size and the signs of production, trade and cattle wealth which all exceed any contemporary settlements by a wide margin. The thirteenth century successor to K2, Mapungubwe, is thought to have been the administrative centre over a region of up to thirty thousand square kilometers in which settlement ranking has been recognized (Huffman 2000).

Related, Leopard's Kopje sites in south-western Zimbabwe are defined as the Mambo phase, contemporary with K2, in the tenth to twelfth century, and the Woolandale phase, contemporary with Mapungubwe, with dates spanning the thirteenth and fourteenth centuries. No obvious ranking among these settlements has been defined although stone walling is common on Woolandale sites. The intra-site settlement arrangement probably conformed to the Central Cattle Pattern because animal dung deposits, as well as mounds which were originally identified as ash and midden deposits, but may actually be dung middens, have been noted at several of the Zimbabwean Leopard's Kopje sites (Huffman 1984a).

In contrast with related sites in south-western Zimbabwe, Woolandale sites in north-eastern Botswana exhibit marked signs of social ranking in settlement distribution patterns. In particular, several large sites were built on hilltops with very large terrace walls (van Waarden 1998). The scale of terrace construction at Selolwe and Sekukwe implied control over a considerable labour force. Large kraal deposits confirmed ownership of substantial cattle herds by the residents of the sites. Smaller sites on hilltops, some with low walling, and sites on lower ground, with animal kraals but without stone walls, completed the settlement hierarchy. Another large settlement with terrace walls resembling the Leopard's Kopje elite sites in Botswana was Mapela, a large settlement situated at the confluence of the Shashe and Shashani Rivers in Zimbabwe. Here, Mapela had a strategic position from which it could benefit as an intermediary between Mapungubwe and the gold mines of the Zimbabwean and Tati mineral belts. The large number of glass trade beads recovered at Mapela and the remains of solid clay house structures of the same type as those built during Periods III and IV at Great Zimbabwe on the upper platform at Mapela (Garlake 1968) support van Waarden's interpretation of the site as a centre where status was acquired by individuals who controlled the flow of trade commodities between regions.

2.3.4 The Zimbabwe sovereignty – mid-second millennium AD

The cattle culture, complex settlement hierarchies, architectural structures and exchange networks among Leopard's Kopje sites reflect the nature of society which was the foundation of the political formation centred at Great Zimbabwe (Garlake 1973; Huffman 1986a; 1996b; 1997; 2000; Pikirayi 2001; Mitchell 2002). Woolandale communities in south-western Zimbabwe and eastern Botswana had supplied gold to Mapungubwe for export. However, a more direct route from the gold belts to the coastal trade was directly eastward to Great Zimbabwe and along the Runde and Save Rivers. When gold became the dominant commodity in the export market, overshadowing the importance of ivory, Great Zimbabwe was in a better geographical position to direct trade. One explanation offered for the decline of Mapungubwe and rise of Great Zimbabwe is that Mapungubwe lost its economic advantage (van Waarden 1998). The Woolandale phase of the Leopard's Kopje Tradition continued into the fourteenth century and must have continued to supply gold to Great Zimbabwe.

Too little is known about settlement organization of the wider society under the control or influence of Great Zimbabwe. Monumental construction work, settlement size, wealth and evidence for long distance exchange are more than sufficient to demonstrate Great Zimbabwe's importance as a political centre. Sites with similar architecture and other material culture, matching Great Zimbabwe in style but not in scale, show the extent of the site's influence. These sites were established across a wide region beginning in the fourteenth century. On the basis of areas enclosed within coursed stone walling at individual sites, Huffman (1986a) defined a settlement hierarchy with six tiers, but acknowledged that insufficient chronological data, overall settlement size outside the walling and the resulting lack of information about political boundaries were all considerable shortcomings to interpreting the settlement data.

The political and economic status of the Zimbabwe Tradition settlements is poorly understood (Sinclair 1987: 151; Soper 1992; Pikirayi 2001). It is not known, for example, whether the sites were an extension of Great Zimbabwe's political authority, directly subordinate to the capital, or independent centres with a tributary relationship to Great Zimbabwe, but their situation probably varied proportional to proximity to the capital (Garlake 1973; Beach 1980; Soper 1992). Sinclair (1987) illustrated the chronological correlation between Zimbabwe Tradition

Site	Lab number	BP date	Cal AD date
Great Zimbabwe	Pta-792	650 ± 50	1298(1316,1352,1390)1406
Great Zimbabwe	Pta-1192	645 ± 40	1303(1319,1349,1392)1404
Great Zimbabwe	Pta-1594	610 ± 40	1316-1352,1390(1402)1414
Great Zimbabwe	Pta-1208	600 ± 50	1316-1352,1390(1402)1421
Great Zimbabwe	SR-47	570 ± 90	1312-1358,1385(1414)1443
Great Zimbabwe	M-915	510 ± 150	1312-1358,1385(1433)1525, 1560-1630
Tsindi	SR-197	505 ± 45	1421(1435)1451
Tsindi	SR-129	500 ± 95	1407(1436)1492
Tsindi	SR-124	440 ± 90	1427(1462)1531,1549-1634
Tsindi	SR-182	370 ± 90	1451(1521,1576,1627)1655
Tsindi	SR-184	365 ± 105	1447(1523,1566,1629)1661
Musimbira	Pta-1194	470 ± 40	1433(1447)1469
Ruanga	N-1146	450 ± 85	1425(1456)1523,1566-1629
Chipadze's	SR-25	650 ± 120	1280(1316,1352,1390)1427
Chipadze's	SR-70	610 ± 90	1298(1403)1430
Chipadze's	SR-71	440 ± 90	1427(1462)1531,1549-1634
Chipadze's	Pta-1141	400 ± 40	1462(1498)1525,1560-1630
Mutare Altar	N-1145	370 ± 100	1447(1521,1576,1627)1658)
Nhunguza	SR-196	465 ± 50	1431(1449)1482
Castle Kopje		480 ± 40	1430(1443)1462
Zvongombe South	Lu-3044	520 ± 50	1414(1430)1447
Zvongombe South	Lu-3045	470 ± 50	1430(1447)1478
Zvongombe South	Lu-3046	460 ± 50	1433(1451)1487
Zvongombe North	St-10948	525 ± 105	1397(1428)1478

Table 7: Calibrated dates for the Zimbabwe Tradition

Site	Lab number	BP date	Cal AD date
Ingombe Ilede	GX-1368	610 ± 85	1300(1403)1428
Ingombe Ilede	GX-1369	505 ± 85	1409(1435)1478
Chedzurgwe	SR-180	510 ± 95	1404(1433)1482
Chedzurgwe	SR-177	415 ± 120	1425(1482)1651
Chedzurgwe	SR-179	350 ± 120	1447(1531,1549,1634)1670,1780-1795
Chedzurgwe	SR-162	210 ± 90	1649(1676,1767,1801)1895,1912-1954
Mukwichi	SR-227	385 ± 80	1449(1513,1594,1620)1647

Table 8: Calibrated dates for the Ingombe Ilede Tradition

sites and the contemporary Woolandale, Musengezi and Harare archaeological phases in the south-west and the north. In the north, Zimbabwe Tradition walled sites appear to be contemporary with smaller, unwall settlements with Musengezi and/or Zimbabwe Tradition pottery (Soper 1992). The Musengezi Phase continued into the sixteenth century and may

have constituted the lower stratified classes under the rule of Great Zimbabwe and the subsequent Mutapa dynasty (Pwiti 1996). South-westward, the Woolandale phase of Leopard's Kopje appears to have continued through Great Zimbabwe's prosperity, with no other archaeological phases identified until the rise of the Khami State in the sixteenth century. Woolan-

dale commoners probably came under the influence of elites inhabiting Zimbabwe structures in the west (Swan 1994: 53).

Swan's (1994) maps of sites from the eleventh to the fifteenth century highlighted the point that all of the sites in the south-eastern quadrant of the country which have been assigned to this period, are walled sites associated with Great Zimbabwe. Two exceptions are a surface collection of pottery from the Mount Buchwa area (Huffman 1978b) and Montevideo, a humble settlement which represents a population of low status farmers who must have supplied agricultural produce and livestock to Great Zimbabwe (Sinclair 1984). Clearer chronological definitions are required to distinguish between Gumanye, Zimbabwe periods 3 and 4 and site size and type before meaningful spatial distribution analyses can be applied to the core area under the dominion of Great Zimbabwe.

Stone-walled sites have not been found in the region occupied by the Ingombe-Ilede archaeological tradition, nor is there any other material culture to suggest that Great Zimbabwe, Khami or the Mutapa state extended their political influence over Ingombe-Ilede sites in the fifteenth and sixteenth centuries, although exchange of metal goods between Great Zimbabwe and Ingombe-Ilede has been recognized for a long time (Garlake 1973). Finds of copper cross-shaped ingots at Great Zimbabwe, Chumnungwa and in undated contexts in the Urungwe district of north-western Zimbabwe illustrated a link of Zimbabwean sites with the burial site at Ingombe-Ilede on the Zambezi River. Even longer distance exchange relationships were exemplified by iron bells found at Great Zimbabwe, as these symbolized chieftainship or were used in bride-price or commercial transactions among central African Kingdoms from West Africa to west-central Africa, particularly the Congo and western Zambia (Vansina 1969). The finds at Great Zimbabwe demonstrated not only long distance trade but also communication and influence of the ideology associated with these artifacts among kings over a very wide region.

Most of the Ingombe-Ilede Tradition sites are on the Urungwe Plateau in north-western Zimbabwe (Garlake 1970) but they are said to extend in a chain along the Rukomeche River towards the Zambezi (P. Stidolph, pers. comm.) and several sites have recently been recorded near Chirundu, on the Zimbabwean bank of the Zambezi close to Ingombe-Ilede itself (Swan 2005). The distribution of documented sites indicates access to the copper resources of the Chinhoyi, Ayryshire and Piriwiri mineral belts and trade routes along tributaries of the Zambezi River.

There is no apparent settlement hierarchy to illustrate social organization among Ingombe-Ilede sites although Chedzurgwe was a particularly large site (Garlake 1970). Adequate information for social stratification was acquired from the well known burial ground at the site of Ingombe-Ilede itself, in the form of differences in grave goods accompanying burials in two different areas of the site (Fagan et al 1969). Metalworking equipment in the central graves might suggest that the individuals were specialist metalworkers. On the other hand, in view of the close symbolic association between leadership and metalworking, the iron tongs, hammers and wire drawing plates may have been incorporated into the graves of elite individuals as a symbolic association between metalworking and social status. Personal adornments in these graves are among the most lavish that were ever accumulated by elites in southern African prehistory.

Craft specialization was a feature of this society. Besides the metalworking evident in the burial goods at Ingombe-Ilede, characteristic Ingombe-Ilede pottery was probably manufactured by specialists because the fabrics are thin-walled, well fired and regularly proportioned and the careful, precise decoration techniques demonstrate development of the skill.

2.4 Defining social organization and explaining social change

Various explanations for the trend towards social hierarchies in southern African prehistory have been proposed and this topic is an ongoing debate. It has been observed that society is inherently conservative and slow to change unless the change is perceived as beneficial to the wider population (Vogel 1990; Holl 2000; Pwiti 2004). When change is witnessed in the archaeological record, some justification must be sought to explain why the general populous conformed with the emergence of class distinction, when the benefits of change accrued to the limited few in hierarchical positions.

One of the themes that have been proposed to explain social change in southern and central Africa is the emergence of lineage heads as administrators of subsistence activities. Social differentiation may have evolved in the Upemba basin flood plain in eastern Congo, in the eighth to ninth century, as a response to its ecology. The opportunities and constraints presented by rich resources and annual floods required collective actions in order to be utilized in a sustainable fashion, and this might have given rise to political

integration in the area. In addition, diverse resources led to population density which in turn led to trade and the need for co-operation or central organization. Surplus production of fish and trade in metals were noted, but rather than explanations for the origins of social differentiation, surplus production was more likely symptomatic of changing social structure (de Maret 1999). The resultant social hierarchies were evident in richly provided burials at Sanga and other sites in the Upemba basin.

Management of subsistence resources is a key element in Garlake's (1978) interpretation of the rise of ten political centres in response to the requirements of managing annual cycles of cattle herd transhumance and distribution. Sinclair (1987) pointed out that this model must be reviewed in the light of the distribution of Zimbabwe stone buildings and the contemporaneity of Harare and Musengezi site clusters, such that all of these archaeological traditions should be interpreted in conjunction with each other. Pwiti (1990) pointed out that a cattle-based approach is viable without the element of transhumance, as site territorial analysis and ethnographic examples showed that cattle could be kept close to a single settlement all year round, although herds lose condition during winter months when nutritional values of grasses deteriorate. Thorp's (1995) study of the age distribution of cattle sampled from midden deposits at Great Zimbabwe and Khami also cast doubt on Garlake's model as most cattle consumed appeared to be natural mortalities, implying that the herds must have been kept close to the settlements. Only the occupants of the Hill at Great Zimbabwe consumed a significantly larger quantity of meat from young animals.

Cattle were likely a key element in the development of hierarchical societies in neighbouring Botswana beginning in the first millennium AD. There, a correlation between cattle kraals and settlement hierarchy provided unambiguous support for Denbow's (1986) explanation that the opportunity to accrue cattle wealth and political alliances, in an environment that was optimal for pastoralism, led to social ranking. This settlement evidence is not equalled in Zimbabwe, where contemporary sites of the Leopard's Kopje Tradition in the south-west of the country have limited cattle kraal remains (Huffman 1984a). Differential accumulation of cattle herds is accepted as one of the initial stimuli to social ranking in Zimbabwe (Pwiti 1996) and although the evidence for large cattle herds associated with the beginnings of social ranking does not exist, cattle figurines in the period prior to the rise of Great Zimbabwe symbolize their significance (Garlake 1973a). Cattle are an

important symbol of wealth in traditional Shona society and are used in the payment of bride-price and at other ceremonial occasions. The slaughter pattern in archaeological samples from second millennium sites indicated that the basic principle of maintaining maximum herd size, hence retaining wealth, was probably of fundamental concern as it is among living populations (Thorp 1995). The ideology associated with the Central Cattle Pattern, spatial elements of which have been recognized in first millennium contexts in eastern Botswana and South Africa (Huffman 1998; Denbow 1999; Whitelaw 1993; 1994), may have been a foundation for social differentiation and may yet be identified in Zimbabwean archaeology.

Studies of mineral production, exchange and distribution can shed light on aspects of the social dynamics of communities who occupied this region before the historic era. The degree to which metal products or evidence for mineral production in the archaeological record help explain transitions in social organization in various parts of southern Africa has been considered. In South Africa, evidence for metalworking in association with other signs of long distance trade, production and ritual in late first millennium contexts were interpreted in terms of economic and political centralization (Whitelaw 1994-95; 1997; Huffman 1997; 2000; Calabrese 2000). In northern Botswana, large collections of metal artifacts from the late first millennium were thought to reflect economic centralization (Miller & van der Merwe 1994b; Denbow 1999). Evidence for metalworking on a large scale in eastern Botswana and northern Zimbabwe in the late-first and early second millennium are also interpreted as evidence for early economic centralization (Kiyaga-Mulindwa 1993; Chirikure & Rehren 2006). This idea has been developed to suggest that craft specialization led to social ranking. In historical examples such as the Njanja of east-central Zimbabwe, independent specialists could theoretically produce sufficient surplus to gain economic advantage. It has been suggested that this model might be relevant in explaining the initial emergence of wealthy and powerful elites in Zambezi society in the late first millennium AD. Several archaeological examples, where control of iron and copper working may have led to the development of political and economic centres at the end of the first millennium AD, were cited to suggest an explanation for the initial development of social hierarchies (Chirikure 2007). However, close examination of the sources used in this model shows that in most cases the evidence for metalworking was relatively sparse, lacking signs of surplus production. Authors were suggesting central control of ritual, long distance trade links or other economic

factors, rather than centralized or surplus metal production.

A further problem with this model is that the Zimbabwean archaeological record does not reflect a situation where specialist metal workers became elites, or where specialists were particularly closely associated with elites. In Zimbabwe, production centres were as dispersed as the resources. Early Zimbabwean production centres have not produced evidence that the specialists who worked there accumulated wealth or power. Elite sites with manifest wealth were not situated in close proximity to rich metal resources. Rather, they were located in positions to behave as political centres for clusters of population groups (Sinclair 1987).

A close link between elite status, metal-working and chieftainship or royalty has been recognized in other parts of Africa (Fagan et al 1969; Herbert 1984; 1993; de Maret 1999). Calabrese (2000) drew on this concept and went further to suggest that centralized control over metal production and the distribution of non-utilitarian metal goods reinforced elite status and power in the Limpopo Valley from AD 900 to 1300. Chirikure (2007) also drew on the metaphorical association between royalty and smiths to explain limited metallurgical debris found in elite settlements at Mapungubwe, Great Zimbabwe, Nhunguza, Tere, Vukwe and Baranda. Symbolic smelting activities may have been practiced at these sites to display elite power over metalworking.

Another suggestion was that control of iron production, rather than participation in the activity, led to political advantage. Several historical models were cited to show that specialists worked under the coercive control of elites for the benefit of the latter (Chirikure 2007). Military control played a role in maintaining the economic structure of political formations in the latter part of the second millennium (Randles 1979: 60; Mudenge 1974; 1988: 114, 154) and the political centres of prehistoric times may have wielded similar forms of control (Sinclair 1987; Pikirayi 1993; Chirikure 2007). In the case of the Musengezi population on the northern plateau, which apparently became subject to the extended political authority of Great Zimbabwe in the fourteenth century, it has been pointed out that military coercion was unlikely because the local ruling group was small, dependent upon its subjects for food supply and building labour, and lived in close proximity to its subjects in undefended sites (Garlake 1973b). Weapons were few. They were not found in association with any style of military establishment and were probably intended for hunting (Garlake 1973a; Pwiti

1996: 160). Nonetheless even in historical times, chiefs are unlikely to have had a standing army but could sound the war drum to mobilize an army from the peasant community within the chieftdom (Bhila 1982: 26–30). In the sixteenth and seventeenth centuries the *Mukomabasha*, the Captain of the Armies of Mutapa, could mobilize a military force within hours to defend the realm and enforce authority over subjects (Mudenge 1988: 20, 90, 154). Even the Rozvi, whose armies were well organized and equipped, relied upon the sound of a gun and war drum to summon men to war, and fighting skills were more likely learned through hunting than from military drills (Mudenge 1974).

If political authority of elite settlements associated with the expansion of Great Zimbabwe onto the northern plateau was not established through military coercion, it was either accepted, having been established previously, or sanctioned through religious ideology (Garlake 1973b). Ritual and symbolism, reflected in the architecture, clay figurines and other material culture at Great Zimbabwe, Nhunguza and Ruanga, show that religion was probably key in “the initial cohesion, organization and stratification of society” (Garlake 1973a; 1973b). Another view holds that leadership authority was founded in the ideology associated with the Central Cattle Pattern, evident in southern African village structures beginning in the first millennium AD (Huffman 1986a). These reflect spatial association between the residence of the village head, a ritual rain-making area, the men’s court and the central cattle byre where burials of important individuals conferred on this area a link with ancestral spirits. Associated metalworking remains and figurines were significant because they represent authority over metalworking and ritual. In combination with cattle wealth and trade, the role of village heads established in the ideology of the Central Cattle Pattern was enhanced to a role of “divine kingship” at Mapungubwe, and the physical separation of his residence amplified his leadership authority (Huffman 1981; 1984b; 1986a; 1986b; 1996b; 1997; 2000). Authority derived from the hierarchy of ancestral spirits, *vadzimu*, whose status reflected the status which the ancestors would have had in life. Offerings would be made to the king’s or chief’s mythical ancestors, *vadzimu re nyika*, requiring them to intercede with God, *Mulungu* or *Mwari* concerning issues of national importance, particularly rainmaking. By comparison, ancestors of the individual family would be called upon to resolve private matters (Jacobson-Widding 1986). Huffman’s interpretation of settlement design has received much criticism. One of the

main points is that it is static and cannot be applied to societies over long periods. There is also the question of whether the choices of sources of evidence are appropriate to explain the Zimbabwean sites (Beach et al 1997; Beach et al 1998). Nonetheless, the model remains "the most ambitious and comprehensive effort at understanding Great Zimbabwe and similar settlements" (Mitchell 2002: 321).

The quantity of imported trade goods in the Zimbabwean archaeological record, in combination with historical documents of Portuguese trade with the kingdom of Mukaranga in the north-east, has logically led to ideas about the role of external trade goods as a stimulus to social ranking. Initially it was thought that the capital derived from external trade accumulated as wealth in the hands of the elite, who maintained a monopoly on trade goods (Huffman 1972; Garlake 1973a; Chanaiwa 1972). Mudenge (1988: 178) debated these views, particularly Chanaiwa's emphasis on "trade as an instrument for exercising authority", stating that "there was no machinery through which the Mutapas could or did impose a monopoly on the extraction of gold and hunting for ivory". In the archaeological sense, an alternative notion was of a hierarchical system based on prestige goods as defined by Friedman and Rowlands (1977), where prestigious imported goods were relatively rare and could be used to reinforce the status of elites. This model has its appeal, particularly as it conforms to the distribution pattern of imported goods in the archaeological record (Sinclair 1987; Swan 1994; Pwiti 1996). Sherds of ceramics imported from the Far East are usually found only at Great Zimbabwe and related, elite settlements. The majority of prestigious, imported goods which survive in the Zimbabwean archaeological record are glass beads. They are only found in small numbers in occupation deposits, even on more recent sites. The larger numbers found in grave deposits give a better indication of the number of beads that were in circulation. The increasing numbers of glass beads through time has been described in detail (Swan 1994) (although examples from the earliest settlements have been shown to be later imports and were therefore out of context (Wood 2000)). An attempt to reinforce a monopoly over the distribution of imported glass beads is evident in the reworking of beads into larger forms using ceramic moulds at Bambandyanalo (Wood 2000).

However, the "prestige goods" model does not explain how the benefits enjoyed by elites were distributed to the lower ranks of society (Pikirayi 2001). The idea that a change in ideology permitted certain individuals to accumulate wealth and status (Pwiti

1996) requires further explanation of the underlying ideological changes. The initial impetus to social ranking and the economic co-operation of the wider population must be justified, and the incentives to maintain the flow of tribute to the political centre must be defined. On one hand, glass beads were distributed to define the status of high-ranking individuals. On the other hand, the presence of imported goods at commoner sites marks their participation in the wider trade network. By offering goods or services, the lower ranks of society could acquire imported goods. Beads are archaeological remnants that represent a variety of commodities and favours that commoners could acquire in return for the minerals that they produced. Beads themselves may have been crucial requirements in certain social transactions, such as bride price, and hence highly valued by all levels of society (Swan 1994). However, if the labour invested by commoners in production is considered, straightforward exchange of surplus production for prestigious commodities is not convincing as a sufficient incentive. Mineral production in particular was time-consuming, arduous and often dangerous. Something more fundamental to their survival must have driven subsistence farmers to undertake activities such as underground mining to produce mineral wealth for the benefit of elites. Under the reign of the Mutapa dynasty, people did not look for gold "unless they needed clothes or food" because agriculture and pastoralism were their principal occupation and their wealth (Mudenge 1988: 162). Thus the acquisition and control of goods, if viewed in isolation, is an unsatisfactory explanation for social differentiation and requires more attention.

Control of internal production and trade by political centres may be a key element in understanding the economics of past Zimbabwean political formations (Sinclair 1984). A convincing notion, which incorporates many of the ideas summarized above, is that kin groups had a customary charter to mediate environmental constraints, through circulation of values and commodities (Vogel 1990). Vogel defined a model for complex societies in Zambesia which, he said, were feudal societies where the authority of certain kin groups as leaders was endorsed by traditional ideology. Communities of the region were interconnected by recognition of vested interests. Vogel's model partly integrated other hypotheses about the rise of complex society in Zambesia. Leadership emerged from kin groups whose authority was chartered by tradition. The initial stimulus to social ranking was the organization of internal exchanges. Rulers mediated spiritual as well as material concerns. In the

second millennium, rulers merged internal exchange networks with the markets of the Indian Ocean coast, and social hierarchies became more distinct when imported luxuries were incorporated into exchanges.

Explanations for social transformation, then, are many and varied. In reality the situation was probably complex, with different social formations in place at various levels or nested scales which varied through time and space (Sinclair 1987). It is likely that all of the above suppositions were important aspects of social transformation in Zambezian prehistory at one time or another and that a combination would account for a multiplicity of changes in society.

3. Changing patterns in the social organization of mineral production

3.1 Introduction

It is apparent that human societies in Zambezia underwent several phases of transformation from the mid-first to the mid-second millennium AD. The socially ranked societies of southern Africa, so conspicuous at the well known sites of Mapungubwe and Great Zimbabwe, were culminations of a gradual process of social ranking among farming communities during this period. In these changing circumstances, iron and copper were used by the earliest farming communities and continued in use throughout prehistory, and gold was used for a more limited period during the late-first and the second millennium AD.

Mineral resources have a wide distribution throughout Zambezia and those which have been exploited in prehistory are often situated in areas of less predictable agricultural potential than the north-eastern part of the plateau, which enjoys both fertile soils and relatively high rainfall. Interaction between this environmental setting and the production of surplus goods intended for exchange, evident in the preceding chapters, have a bearing on the question of how cultures of the past were shaped and transformed.

With this goal in mind, section 3.2 outlines archaeological and historical evidence for human responses to the environmental constraints of the region. The social context of mineral production and trade during the farming period, amplified by the research of the published papers, is described in section 3.3. The data is set out according to the sequence of chronological phases defined by Sinclair (1987), to identify and distinguish processes of change and summarize the resulting perspective on social organization.

3.2 Strategies for survival: responses to environmental constraints

3.2.1 Interpretations based on archaeological and historical evidence

Inconsistent and fluctuating climatic patterns in the south-east African summer rainfall region have presented a challenge to subsistence farmers during the

past two millennia. A considerable amount of research in recent years has focused on the extent to which communities in the past responded to unpredictable environmental conditions. Archaeological research has interpreted the response of past populations to these challenges in various ways. In some cases, systematic surveys and reconstructions of human settlement histories of specific dry or drought-prone areas have identified alternating periods of occupation and abandonment which appear to correlate with climatic reconstructions of wetter and drier phases (Denbow 1986; Sinclair 1987; Huffman 1996a; 2000; Thorp 2005). The physical setting outlined in section 2.2 gives rise to variation in the productive potential in different parts of Zimbabwe (Sinclair 1987). The identification of agro-ecological zones, based on variables such as rainfall, temperature ranges and soil quality recommended different levels of agricultural intensification in the modern, commercial context but had obvious implications for the success of traditional farming in prehistory. Through comparison of the geographical distribution of archaeological settlements of different phases with these agro-ecological zones, Sinclair (1987: 135-137) found that drier areas with less agricultural potential seemed to be avoided in the earlier phases unless resources such as iron or salt attracted human settlement. Later, settlements expanded into some of these areas but most were situated in areas with at least 600 mm of mean annual rainfall.

Other studies reflect continuous occupation of areas through changing environmental conditions and show how societies broadened their subsistence base as a survival strategy (Jonsson 1998; Manyanga 2000; 2006; Ekblom 2004). The importance of using wild food resources and of developing trade networks to ensure the continued survival of coastal towns, particularly in southern Mozambique, has also been emphasized (Ekblom 2004). In recent times, diverse plant economies appear linked with diverse environments and this is likely to have been the case in the past (Jonsson 1998). Wild plants could provide an important source of food (Beach 1977). In modern times, thirty-five species of edible plants are harvested. Flotation of soil samples from excavations at Mwenezi Farm in the Mateke Hills in the dry southern lowveld produced interesting results. Seven species of wild grasses, all of which have cereal values were recovered,

with the likelihood that they had been deliberately harvested (Jonsson 1998).

Crop failure is seldom nationwide and some areas usually succeed in producing a good harvest. In the historical period, communities dealt with crop failure by surviving on wild plants or by seeking refuge with neighbours who had successfully harvested their grain crop (Beach 1977). Social networks or food unions may have been developed for this purpose (Jonsson 1998). Thus, one strategy was to produce a surplus which could be stored or given away with the expectations of reciprocation when needed. This is a key element in understanding past economies and will be discussed more fully below.

Animal husbandry played a vital role as an emergency supply of food in view of the insecure agricultural base. Cattle were crucial as a form of wealth and had important symbolic functions in ceremonial activities and special purpose exchange transactions. However, cattle could be exchanged for grain or slaughtered for food as a last resort. Cattle often dominate the faunal remains of archaeological settlement middens, particularly during the second millennium, with a presence in the first millennium as well. The presence of cattle in faunal assemblages in drought-prone areas at Kadzi (Pwiti 1996; Plug 1997), the Mateke Hills (Manyanga 2000) and at Kwali Camp (Paper 2, Swan 2007a) show that cattle were kept or acquired for subsistence.

Hunting did not provide a large contribution to diet in recent times but was probably practiced as a sport, for variation in the diet and for skins and horns. Large numbers of wild animals could be captured using nets but this was seldom practiced, restricted to times of drought and in dry areas (Beach 1977). Faunal remains from archaeological sites confirm that wild game resources formed an important part of diet in the first millennium and in drier parts of the country (Manyanga 2000). However, hunting was not a sustainable food resource for settled farming communities because typical population levels in farming settlements would put pressure on game numbers. In the second millennium, domesticated species became more important in subsistence, probably as the balance between the amount of land required for agricultural production and pasture, human population and wild animal population levels altered.

Insects are consumed and provide relishes in modern times. The archaeological record reflects the variety of other fauna which were probably collected as food. At Kwali Camp, faunal remains included *Achatina* snail shells and tortoise shells in sufficiently

large quantities for these to have been a significant part of the diet (Paper 2, Swan 2007a).

An alternative to broadening subsistence base and forming social networks to offset agricultural failure was to develop other branches of production for exchange. Internal consumers required such commodities as salt, iron, copper, specularite or graphite, gunpowder, pottery, cloth and tobacco. For external trade, gold, copper and ivory were produced. On the basis of documented history and oral traditions, Beach (1977) explained that mineral production in the traditional Zimbabwean economy could offset agricultural failure in view of the inherently unpredictable Zimbabwean environment.

This theme has occasionally recurred in southern African prehistory. It conveys the notion that manufacturing industries were developed, based on local mineral resources, to produce a surplus for exchange, particularly in areas where agricultural success is unpredictable (eg Beach 1977; Prendergast 1979; Maggs 1982; Bannerman 1981; Swan 1994; Thorp 2005). The chances of agricultural success on the Zimbabwean plateau and adjacent river valleys was widely variable and mineral resources required for agricultural tools and other utensils are widely dispersed. Consequently, communities needed to interact widely and participate in reciprocal exchanges to ensure their continued survival.

There are several ways that communities may have used this approach. At Malilangwe (Swan 1994; Paper 2, 2007a; Thorp 2005), communities were able to take advantage of rich iron ore resources by relying on a broad subsistence resource base, probably during periods when the climate was a little wetter than it is now. In other instances, communities may have responded to environmental stress and agricultural failure by using local resources to produce goods to exchange for subsistence commodities. This is difficult to demonstrate in the archaeological record but a modern analogy is drawn from the devastating droughts of the early 1990s, when the numbers of people participating in illegal gold panning and mining alluvial deposits increased significantly, and continued despite numerous fatal mining accidents (Swan 1994). Gold extraction for exchange was the only apparent means of subsistence for many communities. It is difficult to compare the modern situation with the past because population numbers are now too large to rely on wild resources and diet has altered so that many traditional wild foods are no longer considered palatable. Nonetheless, the analogy shows that a resort to trade in mineral resources is considered a viable alternative to supplement sub-

sistence and this situation may have been similar in the past.

Other strategies for survival involve ideology. Rainmaking ritual was an essential strategy which must not be overlooked. Chiefs and the mythical spirits of their ancestors were intrinsically linked with rainmaking ceremonies and the successful reproduction and survival of society (Jacobson-Widding 1986; Huffman 1986b; 1996a).

An important ideological aspect of society, linked with social networks mentioned above, is the traditional concept of *‘ukama*, which ties family members together in a relationship of equality and obligation to provide for each other. Adherence to the concept is essential and is determined by the ancestral spirit of a family member, the *Mudzimu*. Mutual provision of needs is required within the family (Gelfand 1981). Traditionally, the assets of a *cizwarwa*, a family group comprising a man's sons, daughters and son's children, were a common estate in which each had a right to share, particularly if one was in need. Under Western influence individual ownership has taken preference and the traditional obligation to render assistance has taken on a reciprocal rather than a communal nature (Holleman 1951). “Kinship assumed characteristics of an all-embracing ideology” including concepts of respect for the elders, seniority, the ancestors and mutual assistance with work and when danger or famine struck (Mudenge 1988: 14). This ideology operates at the broader scale of the lineage. The concept of belonging to the group maintains a state of harmony. A tribal spirit takes care of the clan and has a role in selecting the chief (Gelfand 1981). At the community level of the *dunhu*, loyalty is owed to the clan without persuasion or coercion but at a higher political level, kinship does not maintain such unifying bonds although kinship ties and political allegiance can be reinforced by intermarriage (Mudenge 1988: 17, 20). *Ukama* reflects a form of communalism which probably relates to the Tanzanian *Ujamaa*, termed “African socialism”, which emphasized the pursuit of the collective good and was the underlying principle behind Julius Nyerere's attempt to form an essentially African form of post-colonial governance (Nugent 2004).

3.2.2 The question of surplus production

The argument that surpluses were produced for exchange to offset unpredictable agricultural success is sustainable if food production was on a sufficient scale for surplus to be exchanged. The traditions outlined above suggest that successful farmers would produce at least enough food to supply their less for-

tunate neighbours and relatives. Survival was arduous and opportunities to supplement income were always sought. People responded quickly to the requirements of Portuguese and British colonizers in the sixteenth and nineteenth centuries by producing surplus crops and diversifying to include rice production because there were formal, established markets for their produce (Beach 1977; Ekblom 2004).

In preparedness to manage through potential future environmental stress, one would expect communities to maximize productive effort in good years as well as bad. In southern Mozambique, research among contemporary informants showed that villagers were in a position to send excess agricultural produce to local markets in years when a range of wild resources was plentiful and they were able to subsist on these (Ekblom 2004). This would facilitate economic growth in years when the climate was conducive to successful agriculture, abundance of wild resources and assurance of food security. It also illustrates the point that communities strive to produce an excess in order to build wealth, participate in trade and contribute to the general improvement and wellbeing of the local economy.

Historically, the concept of a surplus is associated with the *sadunhu*, the sub-chief of a group of villages in a ward or *dunhu*. Representatives of each village were required to give tribute in the form of labour in the garden, *zunde*, of the *sadunhu*, or, for more distant residences, to give a grain tribute. Consequently, the *sadunhu* had provisions beyond his needs and was expected to provide generously on ceremonial occasions and for the needy in times of drought. He would contribute to the grain tribute demanded by the chief. Crops were sun-dried and stored in airtight granaries built up on stone supports. In these circumstances crops like finger millet can be stored for three to five years without signs of deterioration. In times of drought, “grain and cattle became important items of barter” among the community in general (Mudenge 1988: 16-17).

Other historical sources, however, record that surplus crops were not usually planted, because if they were not needed, the difficulties of storage or transport in search of a market meant that the surplus would probably be wasted. In the absence of guaranteed markets there was little point in producing more than household requirements. At the time of planting, one would not know how much excess to plant. If the rains were good and everyone had plenty, the surplus could be wasted (Beach 1977). Perhaps this was relevant at the village level and in more recent times, but the tribute exacted by political

hierarchy during the reign of the Mutapa dynasty in northern Zimbabwe in the later second millennium AD (Mudenge 1988: 8-20), forms an image of surplus production as a social institution. In terms of supplying areas of need, a prerequisite to surplus food production was the existence of a network for information exchange. Vogel's (1990) model where kin-based leaders mediated in such social requirements would have fulfilled this prerequisite.

Archaeological data for the period prior to the sixteenth century is insufficient to reconstruct a broad synthesis of subsistence and address such questions as surplus food production. Information about agricultural production in prehistory relies on the few seeds which have been recovered by flotation during archaeological excavations, as well as on access of archaeological settlements to arable land, characteristic quern stones used for grinding cereals, agricultural implements and on grain bin remains (Sinclair 1987: 143). In the absence of a regional comparison of these remains it is interesting to note that remains of grain bins are characteristic of some areas, often generally higher rainfall areas such as the eastern highlands (Summers 1958), south of Masvingo (Huffman 1996a), the Matobo Hills (Paul Hubbard pers. comm.) and the northern plateau (eg Figure 1) but also occur in the dry Limpopo Valley (Manyanga 2006). Underground storage pits were found at Garaubikirwe, an elite settlement of the Zimbabwe Tradition on the northern plateau (Mahachi 1990).

Surplus production of minerals and other commodities are easier to demonstrate in the archaeological record. Evidence for mineral production supports Vogel's view of trade and circulation of metal goods or raw materials. Areas where this has been suggested in different periods of time are described in the next section.



Figure 1: Granaries in a rock shelter on the northern plateau.

3.3 Perspectives on the social contexts of mineral production

3.3.1 The first farmers – mid-first millennium AD

There is convincing evidence that metalworking was introduced to Zambezia as a fully formed technology together with a mixed farming lifestyle. Iron-smelting slag accompanies evidence for a southward expansion of farming peoples along the east African coast, reaching Mozambique between the first and third centuries AD, and KwaZulu-Natal in the fifth century AD (Hall & Vogel 1980; Hall 1987; Morais 1988; Mitchell & Whitelaw 2005). The archaeological record lacks a transitional stage of experimentation with new metal technology when stone implements might have continued in use (eg Holl 2000). The few bone or stone implements found in early farming deposits are presumed to reflect contact with groups of foragers.

In Zimbabwe, fragments of iron and/or copper artifacts and metalworking slag and tuyere sherds have been found with the earliest farming settlements in the sixth and seventh centuries AD, including an iron blade fragment and iron-smelting slag in a sixth-century context at Kwali Camp (Paper 2, Swan 2007a).

In view of the widespread availability of iron ore, and presence of slag and tuyeres on most first millennium sites, it has until very recently been assumed that iron production among early farmers was at subsistence level with each village producing implements for its own use from the widely distributed iron ore resources in the region (eg Garlake 1973b: 154; Pwiti 2005). However, the finds at Kwali Camp (Paper 2, Swan 2007a) suggested that the high grade resource available within several kilometres was used to produce metal goods in excess of immediate requirements. This took place between the mid-sixth and the mid-eighth centuries AD.

Mineral production for exchange among early farmers has been noted elsewhere. Salt was extracted at Eiland in South Africa from the fourth century AD and at Harmony for many centuries in the first millennium (Evers 1979; Hall 1987: 66). The earliest farming sites at Chisekera in the dry south-eastern Zimbabwean lowveld are associated with salt deposits (Sinclair 1987: 134). The earliest farmers may have been attracted to exploit iron ore and salt resources to produce goods for exchange.

The notion that groups of early farmers first set-

tled areas with potential for mineral production was supported by settlement remains with distinct but contemporary ceramic traditions in the vicinity of iron ore sources. Pottery at Kwali Camp was associated with the Gokomere Tradition to the west, but its makers were not the only early farmers to have used the magnetite resources of the area. Pottery at Simbiri, a seventh-century settlement with evidence for smelting and smithing, less than one kilometer from Kwali Camp, was associated with the Happy Rest phase to the south-west (Thorpe 2005). Elsewhere, the occurrence of Matola/Silver Leaves pottery near to banded ironstone iron ore resources at Mount Buchwa in southern Zimbabwe (Huffman 1978b) suggested that the mineral deposits attracted early settlement to this area early in the first millennium. Large Gokomere period sites close to Mount Buchwa were marked by slag remains and two sites had distinctly Ziwa-phase pottery, usually found in the north and east (Burrett 2006). This mix of cultural affinities at different, early farming sites showed an overlap of regionally distinct groups to subsume a location with rich iron ore deposits.

In view of the arid environment, a situation where early farmers visited the Malilangwe iron resource for seasonal metal production was considered (Paper 2, Swan 2007a). However, there are other, contemporary settlement remains in the Malilangwe area, with no indications of surplus production of local resources, so the Kwali Camp community is more likely to have been part of a wider community who were settled permanently in the area. Combining a broad subsistence base with the development of a metalworking industry close to high-grade resources was the strategy that enabled them to survive, perhaps even to prosper, in this arid area. Evidence for subsistence at Kwali Camp showed that wild and domestic meat was consumed, and that food gathered from the wild included tortoises, snails and wild oranges. Farmers probably selected this area for its variety of resources, including iron ore, in spite of its low rainfall and high risk of agricultural failure. Evidence for iron production at Kwali Camp was much more substantial than that at neighbouring, contemporary sites, suggesting production of a surplus supply for the wider community in the sixth to eighth centuries. Oral traditions, which record the use of the same iron ore resource to participate in exchange networks for subsistence and social transactions, illustrate some options that the environment both necessitated and offered to local population groups. A cowrie shell found at Kwali Camp confirmed that long distance exchange was a feature of the economy. It seemed likely, therefore,

that the early farmers at Kwali Camp had developed an iron manufacturing industry as part of their strategy to offset the risks of crop failure. This suggests a guaranteed reciprocal arrangement where metal goods could be exchanged for subsistence assurance.

Salt and iron could be regarded as subsistence necessities, but copper is a luxury, produced for personal adornment and to display social status. Copper was smelted close to its source and cast into ingots at Naviundu in the mid-fourth century AD (de Maret 1982) and was smelted near to Kansashi Mine in the mid-fifth century AD (Bisson 2000). Two ingot fragments were found at Kumadzulo in the Zambezi Valley in Zambia in a sixth to seventh century context (Bisson 2000). All were in the process of being broken and reworked into bracelets or beads, signifying manufacture of consumables close to the source of the raw material, presumably for exchange.

The image of prehistory reflected above is of copper and salt deposits used by farming communities from the fourth century in neighbouring areas and from the seventh century on the Zimbabwean plateau. Iron deposits may have been actively sought along the coast from the first century AD and in southern Zambezia from the seventh century.

Faced with environmental challenges, pioneer farming communities expanding into the region likely maintained kinship links along the lines of *“ukama”*, with a strong sense of mutual obligation among extended lineage groups. Such ties would have served as social networks of exchange, to ensure food security. A broad spectrum of subsistence resources as well as exchangeable commodities was utilized. Kinship networks and possibilities for exchange between kin-related communities would permit some communities to develop small industries to produce exchange goods from local mineral resources. This would enable some to occupy more marginal environments where assurance of agricultural success was less secure.

3.3.2 The beginning of economic expansion - later first millennium AD

Signs of surplus production are apparent in the later first millennium AD, contemporary with other signs of emerging social ranks which were described in section 2.3. Internal exchange networks, sometimes over long distances, operated during this period. In addition, the first real sign of contact with the maritime trade of the Indian Ocean coasts, in the form of imported glass beads, implies surplus production intended for external trade. Some sites where relatively

large scale mineral production has been recorded are in areas which are not considered to be agriculturally productive. There are indications of increasing centralization of iron production close to high grade resources.

Evidence for iron production well beyond local subsistence requirements is clear from the seventh to the fourteenth century at Moeng I and slightly later at Makodu, in the Tswapong Hills to the southeast of Toutswe (Kiyaga-Mulindwa 1992; 1993). The surplus of iron produced at these sites may have supplied Schroda (Huffman 2000) for onward transport to Chibuenne at the coast, particularly as copper beads and chain links found at Makodu and Chibuenne indicated associated typology (Kiyaga-Mulindwa 1992). However, the importance of the external trade links should not be overstated and the extreme scarcity of iron-working remains on Toutswe sites, in addition to substantial faunal remains in the absence of animal dung deposits at Makodu, imply acquisition of domestic stock through trade in iron. Surplus iron from Tswapong Hills was probably intended as much to supply the local demand of the Toutswe Society as to exchange for imported prestige goods.

Surplus production of iron by early farming communities in northern Zimbabwe was recently posited. Concentrations of iron-working material at Swart Village showed that the site was a central focus for iron production during the late first to early second millennium AD (Chirikure & Rehren 2006). At the same time, it was suggested that iron-smelting remains found at Surtic Farm (Prendergast 1983) probably reflected a similar situation in the eleventh century.

Research papers 3 and 4 show that copper working appears to have had reasonably early beginnings on the Zimbabwean plateau. Copper was worked at Chinhoyi Caves in north-western Zimbabwe in the eighth century AD (Robinson 1966b; Sheppard & Swart 1971) and probably at other mid-first millennium sites in north-western Zimbabwe (Paper 3, Swan 2002). At Copper Queen Mine (Paper 3, Swan 2002), pottery styles related to Chinhoyi and Dambwa found in the deep waste deposits around the substantial, central workings suggested that a large proportion of copper extraction from the mine took place between 500 and 1100 AD. Iron- and copper-working remains found at the Three-Mile-Water site in west-central Zimbabwe were thought, on the basis of the Ziwa-like ceramics and the bead types, to date in the late first millennium AD (Summers 1969: 61, 178; Paper 4, Swan 2007b). Copper mining was taking place at the same period at the rich deposits at Phalaborwa in South Africa, where the earliest date

for underground copper extraction is in the eighth century (van der Merwe & Scully 1971).

Evidence for copper production and trade in the first millennium in Zimbabwe implies a nascent industry with long distance connections to an established culture of copper-working further to the north. The pottery found at Chinhoyi Caves and other sites in north-western Zimbabwe was said to mark a southward expansion of mid-first millennium farming communities across the Zambezi from southern Zambia because pottery styles were related to mid-first millennium assemblages at Kalundu and Kapwirimbwe (Huffman 1979; Paper 3, Swan 2002). By implication, the copper-working tradition in north-western Zimbabwe from the eighth century may indicate a cultural extension of the Congo-Zambian tradition of copper-working which was evident at Naviundu, Kansanshi and Kumadzulo. Further to the north, ceremonial burial goods in the Upemba Basin on the upper Lualaba River testify that access to metal goods signified elite status among an emergent hierarchy in the eighth to ninth century, Early Kisanian phase (de Maret 1999; Paper 4, Swan 2007b).

Despite the lack of archaeological evidence for gold production from reef resources until a few centuries later, settlement distribution patterns showed a move of Zhizo settlements towards gold-bearing areas in the later first millennium (Sinclair 1987: 135; Swan 1994). Alluvial sources of gold are said to have been the first used to provide gold for trade and reef resources tapped later (Phimister 1974; Summers 1969). The process of washing alluvial gold from river beds in traditional wooden pans and exporting it as dust or small nodules in porcupine or vulture quills, or any other organic receptacle, would leave no archaeological trace. Al-Mas'udi's early tenth century historical reference to the gold and ivory exported from Sofala is often cited. Faunal remains from the Zhizo period at Schroda, in the Limpopo Valley, included the debris of ivory preparation, probably for export. Involvement of the site in long distance trade with the coast was confirmed by large numbers of imported glass beads. The evidence for external trade at Schroda and at Chibuenne on the Mozambique coast in the late first millennium AD renders them the principal candidates as markets for the goods in Mas'udi's account (Sinclair 1987: 86-91; Hall 1987; Huffman 2000; Mitchell 2002). Alluvial deposits of gold can be panned from many rivers including those of south-western Zimbabwe, as gold will have washed into them from the rich gold-bearing rocks of the Gwanda, Antelope, Shashe and Tati geological formations (Huffman 1997). Contact between Zhizo

communities in the Limpopo Valley and on the southern Zimbabwean plateau might be interpreted in terms of access to gold resources.

Large scale salt extraction in north-western Zimbabwe during the late first millennium has been recorded (Swan 2001). Several very large mounds of potsherds were found adjacent to salt springs on Makai Hill close to the Busi River in Chizarira National Park (Figure 2). The pottery must have been used in a salt extraction process similar to an ethnographic example recorded in Chireya, 65 km northeast of Makai (Mutema 1996). Diagnostic potsherds collected from the Chizarira mounds closely resembled a ninth century assemblage collected at Kapula Vlei in western Zimbabwe (Robinson 1966a) and ceramics from a seventh to eighth century occupation at Dambwa near Livingstone in Zambia (Fagan et al 1969: 3-54). The similarity between the Makai, Kapula and Dambwa collections and the large size of the pottery mounds were convincing evidence for intensive salt extraction from the Chizarira salt springs between the seventh and ninth centuries. Archaeological settlement sites have not been noted in the Chizarira area. In view of the arid climate, poor, thin soils and low agricultural potential of the Chizarira area, I suggested that the salt resource must have been used by Early Farming Communities as a trade commodity to supplement their subsistence requirements.

Findings from the Tsodilo Hills in north-western Botswana reflected the development of economic advantage through intra-regional trade in surplus goods (Denbow 1990; Miller & van der Merwe 1994). A range of resources from a wide region had been acquired at the hilltop site of Divuyu between the mid-sixth and the mid-eighth century, and Nqoma, below Divuyu, between the mid-ninth and late eleventh century. These included more than 150 artefacts of iron and copper at Divuyu and ten times that quantity at Nqoma. A large number were items of personal adornment, high-

lighting their role as luxury goods for exhibiting status. The economic opportunism exercised at Divuyu and Nqoma was unique in the northern Kalahari and, by interpretation, the finds at these sites reflect political centralization and dominance.

These changes in the scale of production and trade in southern Africa took place within the context of early signs of social ranking that are apparent in settlement data (section 2.3). The question of how these changes were rationalized within society is important. Surplus production for profit and accumulation of power was contrary to African ideology but could be permitted if it was perceived as generally beneficial to the wider group (Vogel 1990). Since the beginnings of farming in Zambezia, kindred groups probably maintained economic interdependence and this facilitated development of important resources, such as iron and salt, which were often found in semi-arid environments, not conducive to subsistence farming.

Identifying the incentive for surplus production is a key aspect in this interpretation. The position taken here is that communities produced sufficient to provide kindred groups in order to ensure reciprocal provision when pressured by environmental stress. A similar point of view (eg Shennan 1999) holds that communities perceive the general benefits of increased production and specialization to society as a whole. They are conscious that participation in surplus production contributes to the improved welfare of society and improves their own livelihood. In Vogel's (1990) model, lineage heads managed the circulation of necessary goods in their vicinity and took part in information exchange. By arbitrating the circulation of information and material benefits, traditional leaders would have been able to enhance their prestige and rationalize their elevated social positions. Consequently, political agencies arose to redistribute goods. Individuals, who were "socially enfranchised administrators", took it upon themselves to arbitrate



Figure 2: Midden 2, Makai salt spring, Chizarira National Park.

affairs of their kin and acquired status as redistributors of value (Vogel 1990; Holl 2000).

If a formal sector were established for the redistribution of surplus goods in this manner, it would have stimulated production and economic growth. All ranks of society who perceived the benefits would participate, to ensure access to subsistence and hence ensure survival, and to enjoy the advantages of being part of the regional system. The sense of belonging to a broad economic network would provide the incentive for surplus or specialist production. Vogel's (1990) model of descent-commissioned managers who mediated exchanges of materials and information among domestic social networks in the first millennium AD aligns well with the archaeological data. There is evidence that strategic properties, mineral deposits, were exploited on sufficient scale to supply established, structured networks for material transfer. The guarantee of reciprocal exchanges, arbitrated by kindred-enfranchised, emergent leaders, promoted and encouraged increased production. The increase through time in the numbers of imported goods in sites of all class levels marks their increased participation in the wider trade network and means that more local goods were made available for exchange. The increasing production of gold and copper in the early second millennium AD, described below, demonstrates this point.

3.3.3 Socially ranked societies of the early second millennium AD

The large capacity iron-smelting furnace types of the early second millennium (Table 6), described in Paper 1 (Swan 2003), may have been a response to an increased demand for iron. Pikirayi (2001) has speculated that iron production increased at the end of the first millennium and beginning of the second millennium as developing social and political complexity stimulated economic and technological responses. Iron implements would have been required for increased agricultural output, especially as settlement distribution expanded onto heavy, red clay soils associated with mineral belts. Tools were also required for mining, for elephant hunting and ivory preparation and masonry work in the construction of stone-walled settlements (Pikirayi 2001: 101). In support of this notion, there were several iron-smelting sites in the vicinity of Tebekwe Mine in Shurugwi, one of the largest gold producers in modern times and mined in prehistory (Swan 1994). These iron-smelting sites probably supplied the tools required for mining although their dates are unknown.

However, there could be several alternative explanations for the large size of furnaces dating from the early second millennium (Paper 1, Swan 2003). Iron production may have become more centralized around higher grade ore resources, or the large furnace type may have been dictated by cultural rather than functional requirements. The large furnace types with multiple tuyere inlets at this period are thought likely to have operated using natural draft, and would not necessarily have produced larger quantities of metal than smaller, forced draft furnaces. Iron production can have a devastating impact on ecology because the massive quantities of charcoal required meant felling large areas of forest (Paper 1, Swan 2003). There is no evidence to suggest that iron production activities in Zimbabwe have ever been so large as to produce very large mounds of slag and to have a lasting affect on the environment as the centralized, intensive iron working did in other African centres such as Mema, Buhaya and Meroe. Iron production in Zimbabwe was much more dispersed. Even Njanja society, known ethnographically as producers of iron on a large scale, has not left noticeable quantities of slag mounds (Chirikure 2007).

Another important consideration is the difficulty in substantiating a claim for dramatic production increase at any particular period. Until the evidence from Mhangula described in Paper 2, iron smelting evidence dating from before the late second millennium AD had not been quantified. There is no information about first millennium furnace types or capacities with which to compare the large furnaces of the early second millennium. The concentration of smelting debris at Kwali Camp (Paper 2, Swan 2007a) indicates reasonably intensive iron production several centuries before the end of the first millennium, as well as the choice of a high grade iron resource. This new evidence suggests that the increase in iron production through time was a more gradual process, and was founded in the early days of farming settlement in the region.

At Copper Queen Mine (Paper 3, Swan 2002), extraction of copper continued from the later first millennium into the early fifteenth century AD. The chrono-stratigraphy of north-western Zimbabwe is not well known and the transition, if one exists, from the Chinhoyi to the Ingombe Ilede archaeological traditions is undefined. As the period of mining at Copper Queen continued through this transitional period, the socio-cultural context of copper production could not be clearly stated. The important point to note is that copper was produced for exchange through this period. With this in mind, there is an

interesting chronological link with HIIH-type copper ingots which were manufactured in Zambia from the ninth to the twelfth century and appeared in Kabambian burials in the Upemba Basin in the thirteenth or fourteenth century. These ingot types are distributed in the portion of north-western Zimbabwe occupied by the Chinhoyi and Ingombe Ilede archaeological traditions. Ingots or ingot moulds of this type have been found at stone settlements of the Zimbabwe Tradition in the south (Swan 2007b, Paper 4). The apparent spread of HIIH ingots northward and southward from their origin in Zambia coincides chronologically with the transition from Chinhoyi to Ingombe Ilede material culture in the archaeological record. The use of HIIH ingots originated in the later first millennium AD and by the fourteenth century they were recognised as prestigious symbols associated with high social status.

Fuelled by the demand of the coastal trade, gold working activities increased during the early second millennium. By the thirteenth century, reefs were mined in south-western Zimbabwe. Timber found in deep workings on the Geelong Mine near Gwanda was dated in the thirteenth century. At Aboyne Mine, the burial of a man who had perished in a mining accident was found with blue glass beads and a sherd of Woolandale pottery. Skeletal remains of three more miners who had died in a rock fall in the mine were recovered from inside the mine-shaft (Summers 1969: 28). Associated charcoal was dated in the thirteenth to fourteenth century, which fits well with dates from Woolandale settlements. Sherds of Woolandale pottery were found in the fill of two pre-colonial gold mines (Summers 1969: 122) and three sites with Woolandale pottery were very close to mines with early gold-workings. The archaeological remains of pre-colonial mines themselves were paid little research attention in the twentieth century and most have now been demolished. However, spatial analysis of archaeological settlements with relation to gold mine workings showed a gradual move of settlements closer to gold resources, particularly around the rich deposits of the south-western plateau, beginning with Zhizo settlements, continuing through the Mambo phase and culminating in a very close correlation between Woolandale settlements and gold mines in the eleventh to fourteenth century (Swan 1994).

Evidence for processing of gold ore was found at Macardon Claims, on the Gwanda gold belt in southern Zimbabwe (Jones 1939; Swan 1996). A large number of mining tools collected from the site are kept in the collections at the Zimbabwe Museum of Human Sciences. Unused gold beads found

at the site confirmed that the village occupants were involved with the production of gold from the initial, extraction stage to the manufacture of finished products. Pottery styles and tenth-to-thirteenth century imported porcelain confirmed that the site was a contemporary of Mapungubwe. Further proof for gold-working takes the form of crucibles, in which gold, already separated from ore by crushing and panning, was heated to a molten state for pouring into moulds. Sherds of crucibles have been found in association with Woolandale or Mapungubwe assemblages at Nthabazikamambo and Mbauro (Swan 1994: 65).

Most gold produced in the southern African interior was exported, probably in a raw form. Some was retained by local elites whose smiths manufactured items for the personal adornment of the leaders. The famous golden artifacts from burials at Mapungubwe are the earliest sign that elites in southern Africa adopted gold as a prestigious symbol. Prior to this, gold must have been viewed as an exchange commodity. The gold-smiths at Macardon Claims acquired prestigious goods through exchange or reward. These goods included glass beads, sea shells and particularly imported ceramics, which were usually restricted to elite sites. Finds at Mapela, in addition to its strategic location, strongly implied export of gold from the producers at Woolandale sites to the elite centre at Mapungubwe, before the major power centre shifted to Great Zimbabwe.

Finds at Chivowa Hill, a typical Gumanye facies, walled, hilltop settlement, 34 km to the north of Great Zimbabwe, raised important questions about the economic aspect of society in the early second millennium AD, prior to Great Zimbabwe's political dominance of this area (Sinclair 1984). These finds included metal artifacts and evidence for mineral processing, marine shells and large numbers of glass beads representing exchange with the coast, numerous clay figurines, grain storage, access to arable land and significance of cattle in the faunal assemblage. Together, these demonstrated the importance of access to diverse branches of production by occupants of hilltop residences.

Further, significant social changes have been recognized at political centres in the Limpopo Valley at K2 and subsequently at Mapungubwe (Huffman 1986b; 1997; 2000). Social ranking had, by then, been established within society, and the need for ideologies to justify the elevated social status of certain individuals altered. Vogel (1990) suggests that at this period, the concept of a senior ancestral spirit, analogous to the hierarchy among customary leaders, was commissioned. Domestic ancestral spirits have

a rather mischievous character but senior deities play a more benevolent role, and ceremonial intercession for adequate rainfall would be directed towards the ancestral spirits of senior officials (Jacobson-Widding 1986). At Mapungubwe, settlement structure provided physical separation between the general population and the paramount leader, who took on a ritual role consequent to his access to the senior deity (Huffman 1986a; 1996b; Schoeman 2006). Hence the responsibility to intercede for rain became vested in royalty as part of his obligation to provide material benefit to the wider community.

The challenge remains to explain the nature of the socio-political relations of production. The evidence for surplus production of salt, iron, copper and gold presented in the research Papers as well as preceding research (Swan 1994; 2001; 2002; 2006; 2007a; 2007b) provide archaeological examples showing that communities participated in exchange networks. The possibility that society may have been shaped through direct political control of specialist production has been raised (Chirikure 2007) but the summary of iron smelting sites in Paper 1 emphasized that production sites were as dispersed as the resources themselves, and none was developed on such a significant scale as to signify the emergence of a political centre. It is more convincing to think in terms of descent-commissioned leaders who emerged to arbitrate reciprocal exchanges of produce and eventually gained political authority over wider social spheres of circulation. The general population would have co-operated because they anticipated that their investments in surplus production, for circulation by leaders, would result in future benefit to themselves. They would be reassured of value returned for their efforts (Vogel 1990).

Vogel suggests that “specialized production of minerals” and “status-yielding projects” were secondary to surpluses in indigenous output and contemporary with the emergence of a “differentiated feudal society”. Instead, I suggest that mineral production contributed to the flow of commodities in exchange networks earlier than the first signs of social ranking in the archaeological record, for reasons described above. Thus mineral production played an important part in the basis for elite position.

It seems feasible to suggest that the ideology of *ukama* had a role to play in the emergence of powerful chiefs whose wealth drew on a wide range of products in the early second millennium. Families who recognized the benefits would work to produce commodities for exchange in the knowledge that this would not only improve their own wellbeing but surplus production was also, in a sense, an investment

in a guarantee of benefaction by the chief who could call on families with the ability to provide when necessary. Leaders had social responsibilities to circulate materials, values and information amongst their kin. A profound sense of duty to domestic ancestral spirits by emergent leaders merged economic rationalization with spiritual ideology, where emergent social ranks were mirrored in corresponding hierarchies in the spirit world, with senior ancestral spirits perceived as guardians of the interests of society as a whole.

Vogel (1990) suggests that early in the second millennium AD, customary leaders merged smaller ecological units into larger scale regional exchange networks with administrative functions focused at political centres. Imported goods were given more important roles in society by serving as status symbols and perhaps as special purpose currencies for use in socially defined transactions, thereby controlling access to wives, wealth and status. We might recognize these larger scale administrative units in the regionally distinct material culture of the early second millennium, and accept that political changes could account for transitions in the archaeological record at that period. This interpretation offers an alternative explanation to changes that have previously been viewed in terms of population movements.

3.3.4 The Zimbabwe sovereignty – mid-second millennium AD

Ironically, the wider society which was contemporary with Great Zimbabwe is poorly understood and the limited archaeological evidence from that period is difficult to interpret. Metalworking in the context of Great Zimbabwe and territory in its dominion is unclear and detailed evidence is lacking. The possibility that iron might have been smelted at Great Zimbabwe has been debated (Herbert 1996; Huffman 1996b). Smelting is said to have been associated with other stone walled settlement but contemporaneity of smelting remains with the Zimbabwe phase at these sites is in doubt (Paper 2, Swan 2007a).

Most information about south-eastern Zimbabwe, the core area under the political control of Great Zimbabwe during the mid-second millennium, is from stone walled sites, which might, themselves, occupy the higher ranks of a settlement hierarchy. The notable exception is Montevidéo, a humble settlement contemporary with Great Zimbabwe’s fluorescence. Here, suggestions of agricultural production, access to winter pastures and copper production as well as evidence for cattle keeping and extensive iron smelting and pounding depressions nearby suggest-

ed that produce could have been supplied to Great Zimbabwe. The large population resident at Great Zimbabwe would not be able to produce sufficient subsistence from its own immediate hinterland and must have relied upon surrounding communities for supplies. The importance of control of internal production by the political centre at Great Zimbabwe was apparent (Sinclair 1984).

In support of this notion, surplus iron production from the Darwendale area on the northern plateau may have been directed in the form of tribute towards elite sites of the Zimbabwe Tradition (Prendergast 1979). Paper 2 (Swan 2007a) makes a new contribution to this discussion with the evidence from Mhangula at Malilangwe in the south-eastern lowveld, where high grade ore was smelted on an intensive scale at a period when stone-walled settlements associated with Great Zimbabwe extended into the south-east lowveld. Metal produced at Mhangula smelting site likely supplied raw material for implements exchanged along the trade networks of the Zimbabwe State, through elite sites such as nearby HlambaMlonga.

The context of copper production at the time of Great Zimbabwe is virtually unknown. Archaeological mine workings were scattered throughout the gold belts and were more predominant in the Piriwiri area in the north-west and the Save Valley in the east (Summers 1969). Significantly, large portions of these areas are not suited to agricultural production and are distant from any known political centres. Copper Queen Mine, in the arid Piriwiri area, was mined during the period of Great Zimbabwe's dominance and was probably one of the sources which supplied copper to elite settlements (Paper 3, Swan 2002).

In preparation for casting, copper was melted in deep, conical-shaped, thick-walled crucibles (Swan 1994). A number of these have been recovered from Zimbabwean archaeological sites and are in the collections of the Zimbabwe Museum of Human Sciences. However, the contexts of the finds and dating of sites are not recorded in sufficient detail to allow reconstruction of the pattern of copper artefact manufacture. This requires more detailed study. What is apparent is that these examples of copper working are widespread, and fit a model where control over production was not achieved by keeping production close to the political and economic centre occupied by elites. Rather, production was dispersed over a wide region and the benefits of surplus production accrued to elites by other means.

The pattern which is currently apparent on the basis of the Zimbabwean archaeological record is one where the products of specialist mineral production

were channeled towards elite sites of the Zimbabwe Tradition. This was particularly true in the case of gold extraction. Gold production and trade is obviously an important factor in the development of Great Zimbabwe and some authors have mentioned resources on the Victoria gold belt close to Great Zimbabwe as a potential contributor to the site's economic success. However, the richest gold resources were in the south-west, some distance from Great Zimbabwe. Elite sites were not distributed close to gold resources whereas contemporary sites of the Woolandale facies, with no apparent signs of wealth, showed close spatial distribution and material cultural association with archaeological mines on the highest grade gold ore deposits in the country (Swan 1994). Mining communities supplied gold to elite centres where it was manufactured into ornaments for use by the nobility or used for exchanges with the coast.

Elites received imported luxuries from external trade and passed on some of them to gold producers, but glass beads probably represent an array of goods and favours passed from the elite to the producers. Factors which motivated farmers to take up mining as a supplementary activity, for the benefit of elites, can be explained in terms of Vogel's (1990) model of a "socially mediated trading corporation", where the ultimate obligation of the political leadership was to ensure the reproduction of society by effectively ensuring the circulation of benefits. By the time of Great Zimbabwe, however, social hierarchy was entrenched within society and rationalizing the elevated social position of elites must have taken on a new dimension. Interpretation of the settlement layout of Great Zimbabwe posits that royalty was vested with ritual associated with senior ancestral spirits responsible for rainmaking (Huffman 1996b). This role effectively mediated the spiritual concerns of society to ensure its continued survival (Vogel 1990).

There is a suggestion that centralized control over metal production and the distribution of non-utilitarian metal goods reinforced elite status and power at important centres from AD 900 to 1300 in the Limpopo Valley (Calabrese 2000). These centres are thought to have given rise to the Zimbabwe culture. If this ideology persisted into the Zimbabwe period, limited metallurgical debris found at Zimbabwe Tradition, stone walled settlements of Nhunguza, Great Zimbabwe, Baranda, Tere and Vukwe (Herbert 1996), may reflect symbolic smelting activities to demonstrate elite involvement in metalworking (Prendergast 1979; Chirikure 2007).

The notion of metal artefacts used as symbols to reinforce political status is interesting in view of the

distribution of cross-shaped, copper ingots. An ingot found at Chumnungwa, a stone-walled Zimbabwe period site in the south-west, and two soapstone ingot moulds found at Great Zimbabwe, are of the HHH *croisette* type. Three more “identical” ingots were found in an unnamed Zimbabwe-period walled site in the west-central region (Garlake 1973b: 161, 208). These are among the ingot types used to signify status in burials in Upemba during the thirteenth and fourteenth century, although they were manufactured in Zambia from as early as the ninth century and were used widely from Congo to Mozambique until the late fourteenth century (Paper 4, Swan 2007b). Specific types of metal artefacts in the archaeological record, like double flange-welded iron bells, point to trade or political connections between complex societies in the African past. Similarly, cross-shaped copper ingots illustrate routes of economic and political contact and perhaps shared ideology and symbolism in African prehistory. Elites at Great Zimbabwe appear to have adopted the symbolic aspect of the *croisette* form, which evolved further to the north-west, and manufactured their own *croisettes* as methods of storing wealth associated with chiefs or kings in neighbouring lands.

Later, HXR ingot types were among the combination of grave goods placed in the wealthiest burials at Ingombe Ilede to demonstrate the prestige associated with metalworking and metal artefacts. Grave goods included not only HXR ingots but also metalworking tools, gold beads, copper bangles and ceremonial iron artefacts, all symbols of prestige or wealth. HXR *croisettes* have not been recorded in association with Zimbabwe Tradition sites. The two traditions appear to have been autonomous because none of the material culture associated with the Zimbabwe Tradition is found in the zone occupied by Ingombe Ilede sites. Copper production in the north-west may well have supplied Great Zimbabwe until the early fifteenth century, as exemplified by HHH *croisette* moulds. However, once the wealthy Ingombe Ilede society, identified as the historical Mbara kingdom (Garlake 1970), was established in the early fifteenth century, it probably maintained economic and political independence from Great Zimbabwe and later, Khami and the Mutapa State.

Great Zimbabwe maintained far reaching political and economic contacts and held dominion over an expansive region. Satellite centres were built, probably to ensure the effective movements of materials within the locale of each. These are the stone walled settlements associated with Great Zimbabwe which were established outside its core political area. Ul-

timately it was difficult to maintain the allegiance of these outposts to the political centre. “Kin chartered political formats are prone to fragmentation.” Because the “... close ties of kinship to the central authority are weakened by increasing social distance” (Vogel 1990). The rise of some of the satellite outposts as new political centres eventually saw the decrease in Great Zimbabwe’s influence.

Historical documents record the nature of the political economies of the Mutapa, Torwa and Rozwi authorities of the later second millennium but it is not known to what extent the political nature of these more recent social formations existed during the earlier days of Great Zimbabwe. One interpretation of these historical sources states that the authorities maintained tight control and a monopoly on the movement of goods by dispatching armies to extract tribute from tardy contributors and to expel errant Portuguese traders. The king had control over the development of natural resources but also had a divine role (Chanaiwa 1972). Another interpretation is that cohesion within chiefdoms relied less on kinship loyalty than on the “presence of military forces, the practice of venerating the ancestors of chiefs and a common belief in a High God” (Mudenge 1988: 20). These interpretations of history shed some light on the political structures which may have been in place during the reign of Great Zimbabwe over much of Zambezia. However, ideology, which justified the advantageous social status of the elite, probably changed through time. Information about the relative importance of military strength, divine kingship or other source of power of the elite at Great Zimbabwe relies on archaeological interpretation.

4. Conclusions and future perspectives

The study has outlined an environment between the Zambezi and Limpopo Rivers where agricultural success is inherently unpredictable. A mosaic of different risk management strategies used through time and space enhanced social resilience to the environmental constraints of the region. Human responses to environmental stresses which have been identified included broadening subsistence base, production of surplus goods intended for exchange, patronage within kin groups, mutual systems of reliance, reciprocal exchange networks and ideology associated with rainmaking rituals. Mineral resources in particular were exploited for the development of manufacturing industries to produce exchangeable commodities. Mineral production in the more marginal environments of the region has been demonstrated. Evidence for intensive mineral production in certain areas suggests that some form of demand and guarantee of reciprocal exchanges existed for the redistribution of essential goods. The necessity to develop complex systems of reciprocity in the context of mutual systems of reliance was a convincing model for the social relations of production as well as an explanation for political complexity. The model of lineage heads as social mediators or patrons in the circulation of goods and values is constructive for articulating the relationship between political organization and mineral production and provides a comfortable fit with the archaeological record. Intricate systems of reciprocity, obligation, redistribution and tribute developed and became part of the ideological context for complex societies in Zimbabwean prehistory.

Large areas of Zimbabwe remain unexplored archaeologically. In the future, it will be productive to adopt a holistic approach to archaeological research, examining all aspects of material culture and environment to define regionally and temporally specific economic, political and environmental circumstances. The distribution of mineral resources, production and consumption of mineral products are useful aspects of material culture that have not yet been fully explored and opportunities exist for research based on literature and museum collections as well as new field research. Close attention to the scale and importance of resources, production and products to regionally and chronologically distinct population groups can be used to test existing ideas and formulate new hypotheses about past economies. Geographically

specific palaeo-environmental studies in areas of archaeological research will improve our understanding of human responses to environmental fluctuations and stresses. Continued ethno-archaeological studies of traditional social organization and values have a potentially important contribution. It is essential to remain focused on the multiplicity in Zimbabwe's archaeological heritage. Close attention to chronological and geographical distinction is essential if an understanding of diachronic processes and the rich diversity of Zimbabwe's past is to be achieved. A final comment is that the economic successes of the past are evident and might be given more consequence in guiding modern economic policy.

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