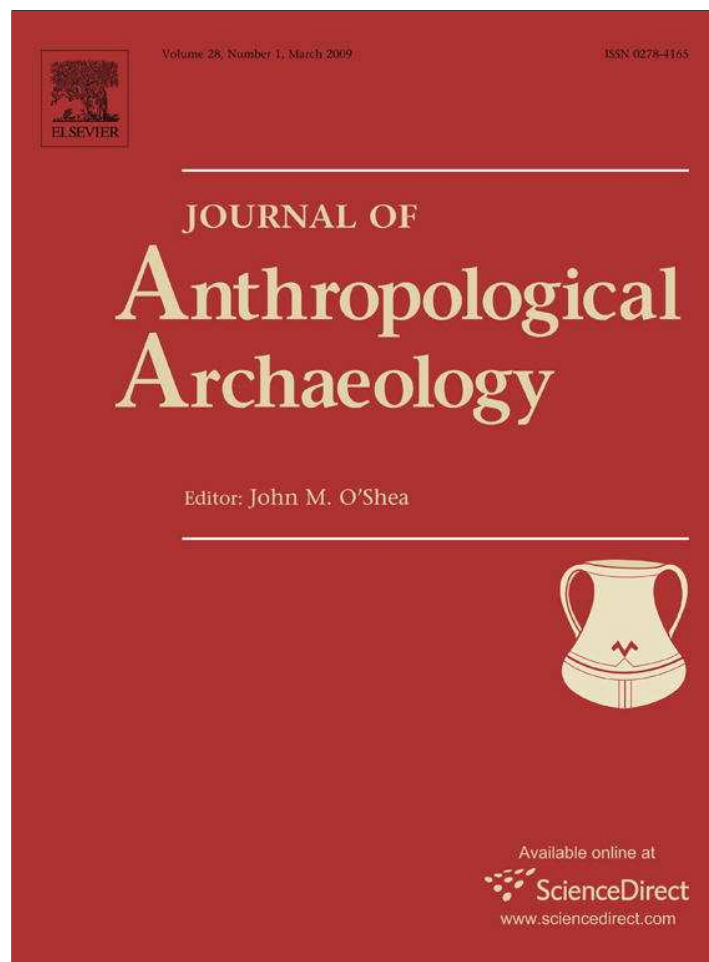




This article appeared in a journal published by Elsevier. The attached copy is furnished to the author for internal non-commercial research and education use, including for instruction at the authors institution and sharing with colleagues.

Other uses, including reproduction and distribution, or selling or licensing copies, or posting to personal, institutional or third party websites are prohibited.

In most cases authors are permitted to post their version of the article (e.g. in Word or Tex form) to their personal website or institutional repository. Authors requiring further information regarding Elsevier's archiving and manuscript policies are encouraged to visit:

<http://www.elsevier.com/copyright>



Contents lists available at ScienceDirect

Journal of Anthropological Archaeology

journal homepage: www.elsevier.com/locate/jaa



Mapungubwe and Great Zimbabwe: The origin and spread of social complexity in southern Africa

Thomas N. Huffman *

School of Geography, Archaeology and Environmental Studies, University of the Witwatersrand, Private Bag 3, P.O. Wits, 2050 Johannesburg, South Africa

ARTICLE INFO

Article history:

Received 22 January 2008

Revision received 23 October 2008

Available online 3 December 2008

Keywords:

Climatic change

Early states

Great Zimbabwe

Mapungubwe

Social complexity

Southern African Iron Age

Zimbabwe birds

ABSTRACT

Stratified societies in southern Africa first developed in the Shashe–Limpopo Basin. As is well known, rank-based society at K2 developed into class distinction at Mapungubwe. The transfer of this new social organisation to Great Zimbabwe has received less attention. New research on rainmaking practices suggests that a Mapungubwe dynasty introduced class structures at Great Zimbabwe. Poor climatic conditions at the end of the 13th century undermined sacred leaders at Mapungubwe itself, and while vulnerable, the elite at Great Zimbabwe took over the important gold and ivory trade. Among other things, the new elite used the unique Zimbabwe birdstones to establish their legitimacy.

© 2008 Elsevier Inc. All rights reserved.

Mapungubwe and Great Zimbabwe are of international interest because they represent the development of indigenous states in southern Africa (Fig. 1). From an anthropological perspective, they are examples of a secondary state: trade contacts with more developed societies provided new opportunities that stimulated greater social complexity. This greater complexity first developed at Mapungubwe, and then its archaeological expression was later elaborated at Great Zimbabwe. At a general level, the development of Mapungubwe is fairly well-known: surplus trade wealth and a growing population helped to transform a ranked, kin-based society with male hereditary leadership at K2 to a class-based bureaucracy with sacred leadership at Mapungubwe (e.g., Huffman, 1982; Mitchell, 2002; Pikirayi, 2000; Pwiti, 2005).

The rise of Great Zimbabwe, on the other hand, requires further consideration. The people at Great Zimbabwe and Mapungubwe spoke related forms of the Shona language, but they belonged to separate ethno-historical groups (Huffman, 2007a). The rise of Great Zimbabwe was therefore not a simple transfer of political power; it also involved the incorporation of a new ideology and related practices. Because the origin and development occurred relatively recently, Mapungubwe and Great Zimbabwe provide a case study that may contribute to a better understanding of similar processes in the more remote past.

To consider the rise of Great Zimbabwe, it is first important to understand the sequence in the Mapungubwe area. I begin with a brief outline of the physical and cultural terrains.

Cultural landscapes

The Mapungubwe landscape incorporates an extensive valley system around the Shashe–Limpopo confluence, as well as the surrounding plateaus in Botswana, South Africa and Zimbabwe (Fig. 2). Geologically, Mapungubwe lies within a sandstone topography interrupted by mafic intrusions. The movements of two ancient continents caused these intrusions (McCarthy and Rubidge, 2005: 108–111), and the area is still seismically active. The possible impact of earthquakes and rock falls on the Mapungubwe sequence is currently under investigation.

In terms of climate, the Basin is only about 600 m above sea level and therefore lies within a rainfall trough. The present-day average of 320–350 mm per year is insufficient for the traditional cultivation of sorghums and millets, but rainfall was adequate during the Medieval Warm Epoch, between about 1000 and 1300 AD (Smith, 2005; Tyson et al., 2000). With such adequate rainfall, flooding would have been a regular, seasonal occurrence in pre-colonial times.

Regardless of rainfall variation, the Mapungubwe area is capable of supporting large herds of elephants. Dry-land trees such as mopane and dry-land grasses, coupled with permanent water, create ideal conditions. In addition, an enormous vlei, fed by backwater flooding of the Limpopo, supports a huge stand of elephant

* Fax: +27 011 717 6578.

E-mail address: Thomas.Huffman@wits.ac.za

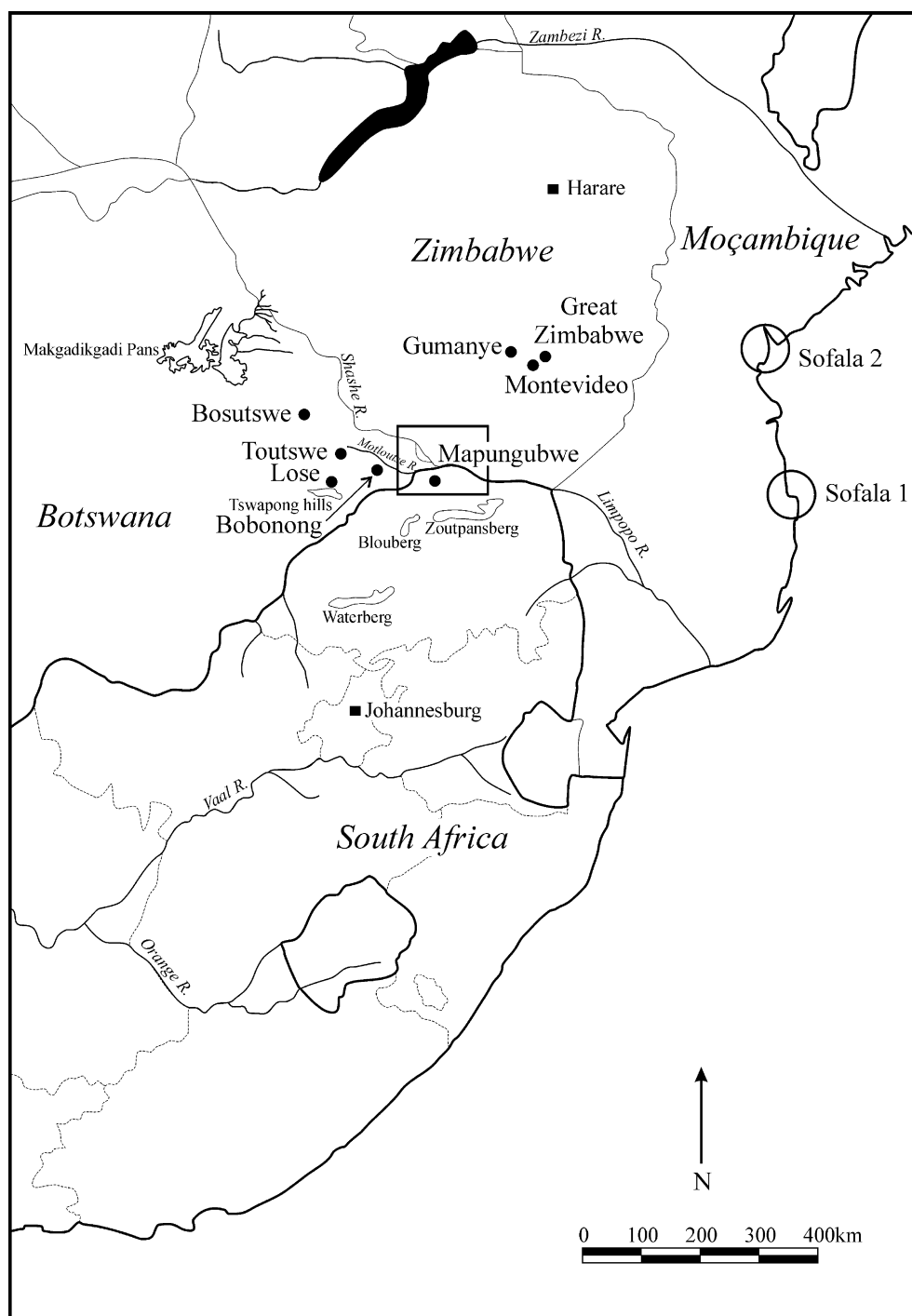


Fig. 1. The Mapungubwe region and other important sites.

grass (*Sporobolus pyramidalus*) that makes the area extraordinarily good for large herds. Once burnt, this grass also provides substantial grazing for cattle, while the loams along the vlei margins provide rich agricultural potential. These environmental conditions greatly influenced the rise of social complexity.

The transformation of ranked societies at K2 into class-based society at Mapungubwe caused changes in the organisation of settlements. Most importantly, the elite Zimbabwe Pattern at Mapungubwe grew out of the Central Cattle Pattern at K2.

The Central Cattle Pattern (hereafter the CCP) is well-known, and a brief outline will be sufficient. The centre of the settlement,

the domain of men, encompasses sunken grain pits (or raised grain bins) for long-term storage, an assembly area where men resolve disputes and make political decisions, a blacksmith's area and cattle kraals where men related by blood and other important people are buried. The outer residential zone, the domain of women, incorporates the households of individual wives with their private sleeping houses, kitchens and graves. These outer households were arranged according to a system of seniority expressed through left and right locations, starting with a 'great hut' built upslope of the court and kraal. At a lower scale, the same dimension applies to the great hut itself: the central fireplace divides the hut into right-

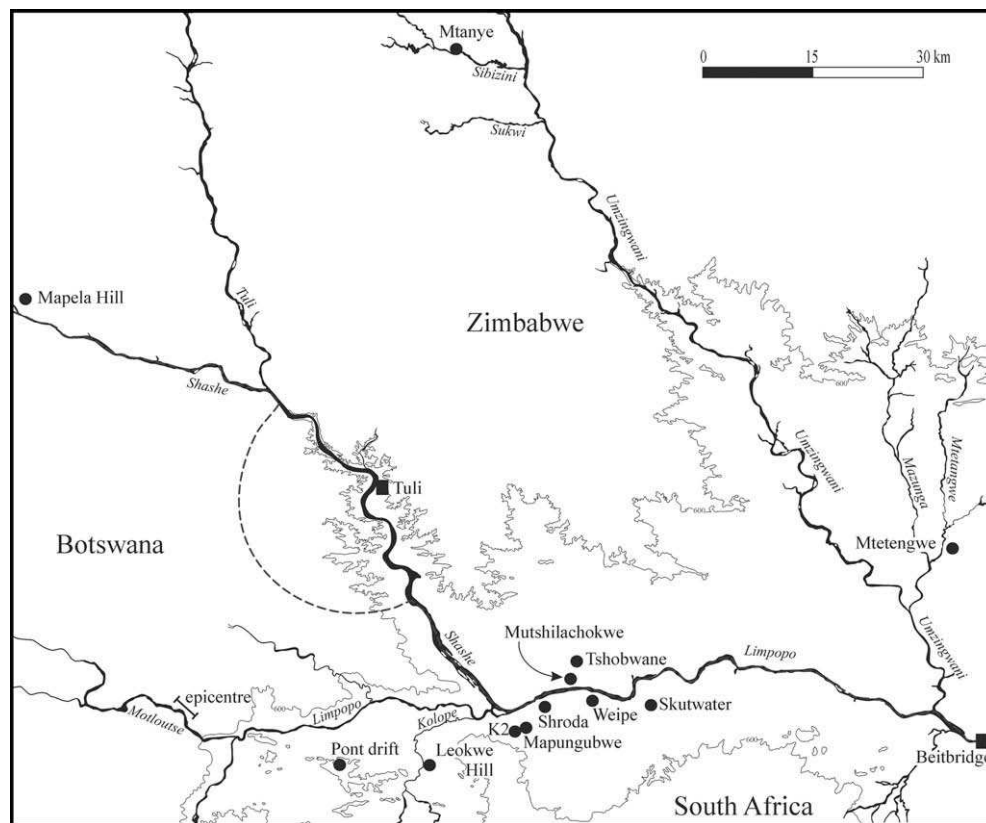


Fig. 2. Mapungubwe region showing some important sites.

male/left-female space. At right angles is a further distinction between front-secular and back-sacred activities that informs not only behaviour in the great hut but also in the household and whole settlement (Kuper, 1982).

As with all ethnographically derived organizational models, the CCP is necessarily connected to a specific social organization, and both are the products of the same specific worldview. In this case, the CCP is the product of Eastern Bantu-speaking, rank-based societies who share a patrilineal ideology about procreation, a preference for bridewealth in cattle, male hereditary leadership and positive beliefs about the role of ancestors in daily life (Fig. 3, lower). It is a cultural package in terms of these five features: the attitudes about procreation, bridewealth, leadership and the ancestors are all interconnected with social ranking. With social ranking, political status was based on kinship relations to the reigning chief and length of time in the chieftom (Kuper, 1982). I do not claim that other aspects, or all cultures, are bounded packages, only that these five features are interrelated and that the CCP is necessarily associated with them, and with Eastern Bantu (In southern Africa, most Iron Age groups can be affiliated with Eastern Bantu through ceramic style Huffman, 2007a, stonewalling Maggs, 1976, and oral history Legassick, 1969). As a result of the necessary connections, we can study this linguistic and cultural package through the CCP.

The Zimbabwe Pattern, the second spatial organisation, can be represented through the same kind of concepts used for the CCP, but the result is quite different (Fig. 3, upper). Each capital, regardless of size, needed five components to function: a palace, court, compound for the leader's wives, place for followers and places for guards. Sacred leaders had to remain aloof, and so the palace was private and sacred. Ideally, it should be placed above, behind and east of the public and secular area allocated to followers. The court, on the other hand, was predominately a male area located to the side of the palace, on a separate status axis, opposed to

the compound for the king's wives. Lastly, the palace and then town should be protected from physical and supernatural danger by concentric rings of guards and medicine. Outside the capitals, commoners organised their homesteads according to the principles of the CCP (Huffman, 1996b). The co-existence of the elite pattern in capitals and the CCP among followers is further evidence for marked social classes.

Like the CCP, this elite pattern is necessarily connected to a specific social organisation and worldview. The Zimbabwe Pattern is the product of Eastern Bantu-speaking people (now Shona and Venda) with a class-based bureaucracy and sacred leadership. The term sacred leadership in southern Africa refers to a mystical association between the leader and the land and a related link between the leader, his ancestors and God. To ensure fertility, it is to God one must turn through the spirits of former leaders.

These two normative models have been the focus of debate for some time (see for example Beach, 1998 and Lane, 1998, 2005, for criticisms and Huffman, 2001, 2004, 2007a,b for responses). Today, the models themselves are no longer the issue. Critics instead question the depth of time the models can be extended back from the present and their usefulness for understanding the archaeological record. Two different theoretical approaches underlay this last point. The first emphasises structure, norms and thought, and the second agency, daily behaviour and practice, that is, society versus the individual.

My approach, like that of Giddens (1984), maintains that cultural norms are embedded in the social context of daily action. Indeed, human action requires the prior existence of norms—'conditioned action' in McGuire's (1996) terminology. Furthermore, the tension between ideal norms (the pressure for continuity) and daily action (the potential for change) is an important social dynamic. As with other theoretical entities, we can study cultural norms, values and beliefs through their effects on material culture.

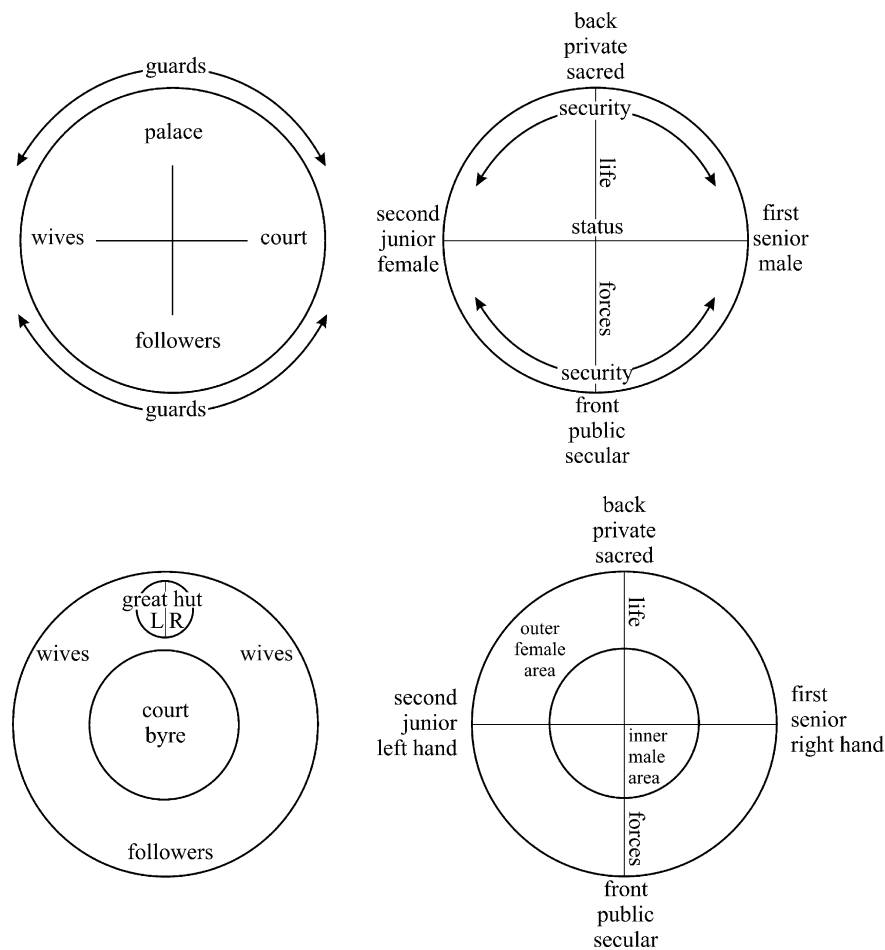


Fig. 3. Idealised model of the Zimbabwe Pattern (upper) and Central Cattle Pattern (lower).

We apply our models, as in any other science, to assess whether they explain the archaeological data better than any other alternative. I make no apology for privileging testable hypotheses.

The other school, in contrast, adopts a more post-processual perspective, informed by both Giddens and Bourdieu (1977). Here daily behaviour produces and reproduces structures and meaning, which are always in a state of 'becoming'. Among other things, this school emphasises the potential for all societies to change. An extreme position held by some is the assumption that most material deposits are the result of daily behaviour uninformed, or only indirectly informed, by values and beliefs.

It is an empirical question, however, whether a different position with a different interest undermines the validity of cognitive models. Significantly, the few archaeological studies of agency in southern Africa (e.g. Hall, 1998; Fredriksen, 2007) are themselves fundamentally structuralist. Not only are they structuralist in nature, they operate within one of the normative models—only at a smaller scale. Scale, then, is the difference. Empirical studies have therefore not undermined the use of cognitive models. Rather, they show that we need to study both norms and daily action, in relation to each other, at large and small scales, to understand the past.

I shift now to a smaller scale to investigate the role of rainmaking.

Rain control was an essential aspect of political power in both the CCP and Zimbabwe Pattern, and these two patterns are associated with two different systems of rainmaking. Recent ethno-archaeological (Murimbika, 2006) and archaeological research (Schoeman, 2006a,b) helps to clarify the two systems. I use modern

detail to illustrate the principles. Among people with the CCP, rainmaking activities are part of the normal agricultural cycle. In September, at the beginning of the cycle, chiefs send a black goat to their professional rainmakers, instructing them to replenish their rain medicines and to repair their work areas. As a principle, these professionals are men; the only recorded exception was a woman with male characteristics, such as a moustache, flat chest, broad shoulders and narrow hips. Over all, chiefs control the process, but unless they receive specific training, they also are usually not rainmakers. Various women and other people, however, could assist the rainmaker. During the cycle, for example, young girls spread rain medicines on the fields. Later, headmen and other important men take burning cattle dung from the capital to their homes, in the belief that the smoke will call the clouds to all corners of the chiefdom. Throughout this time, rainmakers are busy working their medicines, calling the rain and combating enemies who try to keep it dry. They performed this work in a special area called a 'rain kraal' located at the back, or just behind their home-steads. These locations are part of the front-secular/back-sacred dichotomy inherent in the CCP.

The normal rainmaking system appears to work most of the time. But when normal rituals and medicines consistently fail, and droughts persist for three or more seasons, rainmakers go up special hills to 'pull the rain down'. Rainmaking hills are distinctive in that (1) they are usually steep-sided with difficult access, (2) too small and too awkward for normal settlement, yet covered in pottery from different periods, and (3) within the Mapungubwe area exposed sandstone often bears artificial cupules in association with natural cisterns. According to the ethnography, the hills represent

mountains that are, literally, the source of streams; the cisterns represent pools, while the cupules receive ritual beer to propitiate various spirits. There are often many cupules because, each time, rainmakers have to start over. The copious pottery is the result of another important principle: once used in ritual, sacred objects cannot be returned to a domestic context. As a third principle, these hilltop rainmaking places are conceptually in the 'bush', the terrain of supernatural forces.

Schoeman's (2006a,b) research outlines the hilltop signature of CCP rainmaking. As a rule, the hilltop is comparable to the back of a settlement where grain bins, small stock kraals, middens and rain kraals were located. The hilltop grain bins were temporary, however, because they were built directly on the ground, while untrammelled dung shows that the small stock kraals were also temporary. Burnt sorghum is a common find along with other plant remains with symbolic value. All these features are present because the rainmaker must start over again; what ever he did in his rain kraal must be repeated on the hill. Because he sacrificed a goat at the beginning of the cycle, for example, he must sacrifice another on the hill. Independent rainfall evidence (Smith, 2005) shows that this hilltop signature is a cultural proxy for drought (Huffman, 2008).

At the end of his hilltop activities, the rainmaker burns down the temporary grain bin, and then every citizen must perform cleansing rituals. Those people who are thought to have caused the drought (because they broke sacred rules, and so on) have to burn their own grain bins and build a new one on top. Our excavations in mid 2008 in Transitional-Period homesteads uncovered the remains of such double grain bins. Throughout the Mapungubwe landscape, in fact, occupation horizons containing burnt structures (both grain bins and houses) correlate with isotopic evidence (Smith, 2005; Smith et al., 2007) for drought. Thus burnt structures in ordinary homesteads provide another cultural proxy for drought.

A second type of rainmaking was associated with the elite Zimbabwe Pattern. In contrast to the CCP, the rainmaking area was at the back of the palace, and thus in the settlement: it was not in the wild bush. In this elite pattern, the sacred leader was the rainmaker, praying to God through his ancestors. Rather than various medicines and multiple rituals, the senior leader performed his duties only once (usually in July at the harvest festival), involving sorghum beer and the sacrifice of a black bull, before lesser chiefs prayed the same way in their own areas. Later still, other rainmakers continued with the older pattern among the commoners.

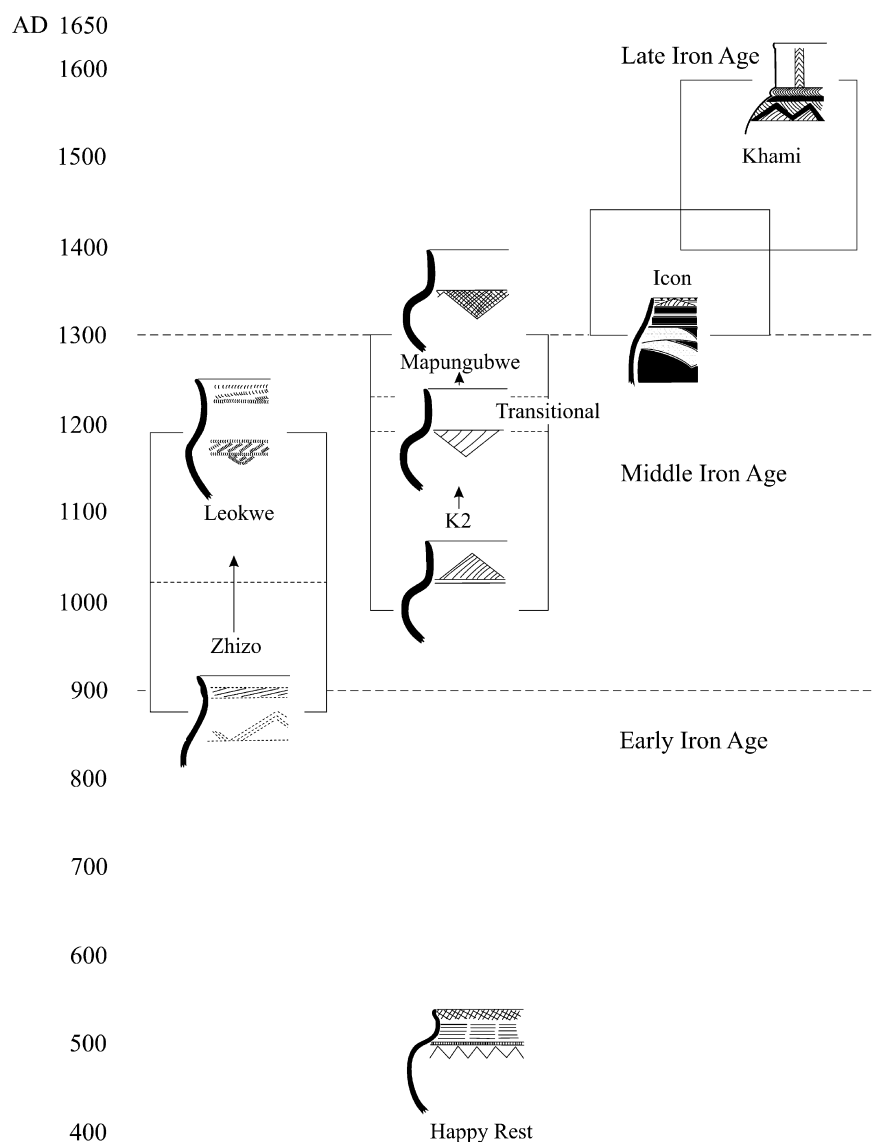


Fig. 4. Iron Age ceramic sequence for the Mapungubwe region.

These two systems of rainmaking, and their associated settlement patterns, provide the cultural background to understand the major transformations that occurred in the Mapungubwe landscape.

Greater social complexity

The archaeological sequence provides the material evidence for the transformations. Intensive surveys have greatly improved our understanding of this sequence (Fig. 4). So far, some 950 Iron Age sites are on record in the South African portion of the region. Further, over 60 radiocarbon dates are now available (all calibrated for the Southern Hemisphere, following Vogel et al., 1993, adjusted in 1998). By convention, we divide this sequence into three arbitrary periods: the Early Iron Age (100–900 AD), the Middle Iron Age (900–1300 AD) and the Late Iron Age (1300–1840 AD).

Ceramic style units (called *facies*) with space and time boundaries form the basis of the culture-history sequence itself. Related facies form Branches (or Sub-Branched) of Traditions. In some cases, well-established terms, such as Leopard's Kopje, serve to denote a cluster of closely related facies. By convention again, we apply the facies name to the group of people who produced the style: thus, Mapungubwe people produced the *Mapungubwe* style, while Leopard's Kopje people produced the various facies in the cluster (see Huffman, 2007a for a comprehensive coverage of southern Africa and justification for the use of ceramic style as a proxy for people).

The first Bantu-speaking farmers moved into the Mapungubwe region between about 350 and 450 AD when rainfall was probably adequate. Early Iron Age pottery has been found at the base of Mapungubwe Hill and on top of at least three other hills in what appear to be rainmaking contexts. The presence of this pottery therefore indicates that early farmers also lived in the area during a drought.

In the Mapungubwe region, rainfall did not improve, and Early Iron Age people left the area. According to the survey record, the area remained unoccupied by farmers for some 400 years.

Later, at about 900 AD, Zhizo people moved into the area from southwest Zimbabwe. Zhizo farmers would have found farming difficult, however, because rainfall conditions had not improved. Some other reason therefore accounts for their presence. Ivory artefacts and imported glass beads in the Zhizo levels at Schroda (Hanisch, 1980) indicate that these people may have purposefully moved into the area to hunt elephants for the coastal trade. Such an emphasis explains the distribution of Zhizo sites: most are located well away from the rich agricultural soils around the floodplain where elephants would destroy the crops. In addition, the wide distribution of Zhizo-period glass beads (Wood, 2005) suggests that Zhizo people traded the beads for grain with more successful farmers.

Zhizo people maintained control of the trade for about 100 years. At about 1000 AD, the Zhizo ceramic style largely disappeared from southwest Zimbabwe and northern South Africa. At the same time, a new capital was established at K2 (Fouché, 1937; Gardner, 1963; Meyer, 1998), and K2 pottery spread over a large part of the Shashe–Limpopo region. This pottery belongs to the Leopard's Kopje cluster, associated with Western Shona-speaking people (Huffman, 1974) and dates to between about 1000 and 1200 AD. Leopard's Kopje settlements followed the principles of the CCP.

At the beginning of K2, the chief's residential zone surrounded the central cattle kraal. Rehabilitation work (directed by M. Murimbika from 2001 to 2003) clarifies the sequence in the central men's area. Ivory workers here tossed their debris on to the court midden, located at first several metres north of the central kraal. After a while, K2 people shifted the kraal further south. Both kraals

were over 30 m in diameter, which is notably large for the region, and both contained multiple crust lines formed by periodic trampling. Usually, cattle only form one crust line through trampling when the kraal is first used, so these multiple crusts show that cattle only occupied the kraals irregularly, rather than daily. This infrequent use is consistent with the status of K2 as a large capital. Later, by about 1150 AD, the second kraal was abandoned, and the court midden progressively covered it. This shift was probably due to a new restricted ownership of cattle and a change in court function. In the later Khami phase, all cattle were more-or-less royal property, and there were two courts, one for commoners and one for nobles; neither court was directly associated with a cattle kraal. This is a fundamental change from the CCP. It does not simply represent a change in herd management, as Denbow et al. (2007) suggest, because every other dependent settlement in the area still had a central cattle kraal throughout the K2 and succeeding Mapungubwe Periods: the capital itself was the only place to change.

There is one sense, however, in which herd management could be said to have changed, and this involves ethnic stratification. When the Schroda chiefdom moved west, as Calabrese (2000, 2007; Vogel and Calabrese, 2000) has shown, some Zhizo people remained behind at Leokwe Hill. These people (now known as Leokwe because their pottery had changed) were clearly under the political authority of K2, just a few kilometres away. Yet, they maintained their own material-culture signature. Leokwe people may therefore have had a role based on their 'First People' status (following Kopytoff, 1989). Another Leokwe complex closer to K2 extends our understanding of their status. A box canyon (2229AB224) two kilometres west of K2 contains several cattle kraals that do not conform to the CCP (Huffman, 2007a: 386). At least four other Leokwe settlements with 'extra' kraals are on record in the vicinity, and Leokwe people were clearly the herdsman. Furthermore, midden excavations at the box canyon have yielded an unusually large proportion of cattle feet (Kloppers, in prep.). According to Shona and Venda ethnography (e.g. Stayt, 1931), lower legs and feet are low-status portions given to herdsman, as opposed to the owner. This 'herdsman pattern' has been recognised so far in three other Leokwe horizons.

The abandonment of the central kraal at K2 suggests that cattle were no longer a medium to bind ordinary people together. If true, the central court had become a place for the common people, and royal cattle were moved away. It is tempting to believe Leokwe people at the box canyon were herding cattle for the elite at K2 itself. Whatever the case, social ranking was becoming more distinct.

In the CCP the magnitude of the court midden is related to the political following of the leader. The irregular use of the central



Fig. 5. Mapungubwe Hill from the west. The treeless area in front housed commoners. The court was sited right of the upright boulder.

kraal, shown by the multiple crusts, is in keeping with an important capital, while the huge number of cattle from the central midden (Voigt, 1983) attests further to the wealth and power of K2 leaders. By 1220 AD, this court midden had grown to a height of nearly 6 m, and by now, K2 probably sheltered some 1500–2000 people.

An abrupt abandonment of K2 at this time coincides with an immediate increase of K2 people around Mapungubwe Hill, less than a kilometre away (Fig. 5). A natural amphitheatre at the bottom of the hill probably sheltered the new court because this is the only sizeable area inside the new town free of residential debris.

The absence of cattle dung anywhere in the vicinity indicates that a kraal was not re-established next to the court (the only known kraal stood on the plateau a few hundred metres north [Meyer, 1998]). The previous shift of cattle away from the centre at K2 was therefore a real spatial transformation and not the result of some temporary expediency.

When the capital was relocated to Mapungubwe, most people lived in front of the court, but a few moved on to the hilltop above. On top, early excavations (Gardner, 1963: 180) uncovered two substantial structures in the western complex (Fig. 6). These special structures were probably the remains of the first king's sleeping

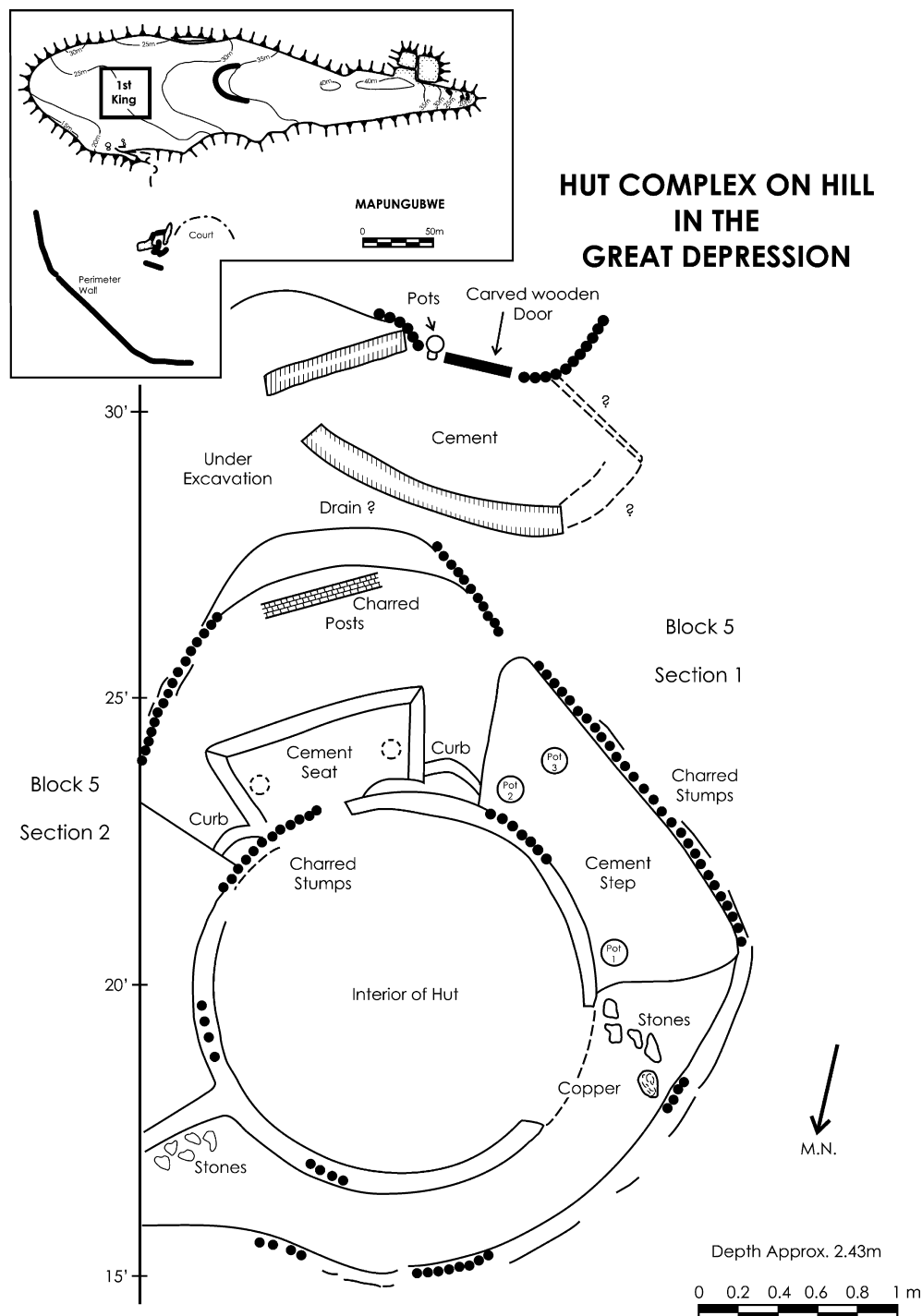


Fig. 6. Hut complex associated with the first King. After Gardner (1963).

house (with a wooden door) and his diviner's office (with two outside fireplaces). Whatever the best interpretation (see Huffman, 1996b, chapter 6 for details), these substantial structures clearly mark an elite area. It is important to note that this elite area, and the move uphill, marks the first time in the prehistory of southern Africa that a senior leader was so physically separated from his followers. This second spatial shift represents the materialisation of class distinction.

Mapungubwe was inhabited for only some 80 years, from about 1220 to 1300 AD. In this short time, the spatial organisation continued to evolve into the new elite pattern (Fig. 7). The new pattern included a stonewalled enclosure that provided ritual seclusion for the king, separating him from family as well as followers. Indeed, this was the first Zimbabwe culture palace. Other stonewalling demarcated entrances to elite areas, noble housing and boundaries of the town centre. These and other similarities with Great Zimbabwe demonstrate that the elite Zimbabwe Pattern originated at K2 and Mapungubwe, rather than at Great Zimbabwe itself. This new elite pattern had probably crystallized by 1250 AD, and it represents the full materialisation of sacred leadership.

In terms of social complexity, the first spatial shift occurred at K2. Consequently, the first cultural changes probably evolved there

out of an intensification of social ranking. When K2 was first established, its spatial layout would have reflected current social relations. Later, because of the fundamental socio-political changes, the layout was out of step, and the spatial pattern had to be adjusted. Initially, K2 people probably believed they were following the old social rules when in fact they were formulating new principles. At this time, the old dominant ideology probably masked the internal transformations. Ultimately, the old spatial pattern became too awkward for the new social rules, and a novel pattern evolved to accommodate the changes. Topographically, the K2 area itself was not suitably shaped for the elite pattern. Since the next court was deliberately sited at the bottom of Mapungubwe Hill and the leader lived on top from the beginning, Mapungubwe was probably established so that the new socio-political order could be spatially expressed.

By this time, Mapungubwe had grown to a large capital, sheltering some 5000 people. With historically known kingdoms, such as the Zulu, there is a necessary correlation between settlement size, settlement hierarchies, overall population and territory (Huffman, 1986). If we apply this correlation to Mapungubwe, then Mapungubwe probably controlled about 30,000 km², the same as the Zulu kingdom. Much work still remains to identify district cen-

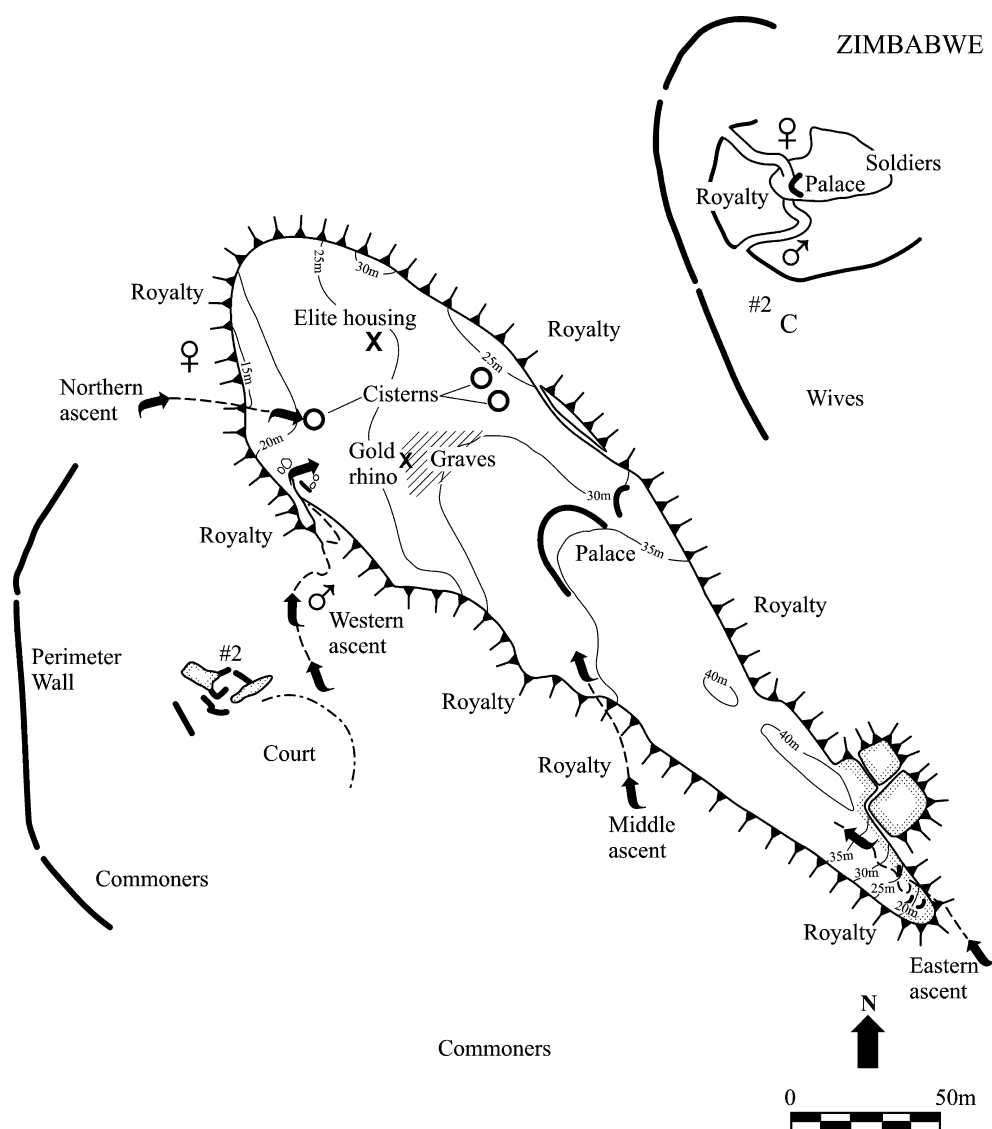


Fig. 7. The Zimbabwe Pattern at Mapungubwe. Note similarity to Great Zimbabwe.

tres. Nevertheless, from the perspective of territory and social complexity, Mapungubwe was the capital of southern Africa's first state.

This sequence of change has a bearing on various theoretical issues. As part of the regional debate, some researchers criticise the nature of normative models in respect to change. Because of their structure, they say, change must come from external forces rather than internal social dynamics (e.g. Lane, 2005). In the case of Mapungubwe, however, trade connections are a historical fact. It is simply not possible to explain the evolution of social complexity in the Mapungubwe landscape without reference to the international trade. It was the transformations that followed that were the result of internal dynamics; external forces provided new opportunities. Cultural norms would have conditioned the responses.

Before the international trade, a social structure was already 'embedded in the context of daily action'. At the scale of the CCP, it included norms about social ranking and hereditary leadership. Various individuals in socially accepted positions seized the new opportunities brought by the trade. Their actions, regardless of individual motivations, led to significant changes in society. These changes then became embedded as norms in a new context.

The tempo of these changes is also worth noting. The norms of the CCP existed for some 700 years beforehand. The changes, on the other hand, took approximately 100 years to crystallise. The resultant Zimbabwe Pattern then continued for 600 years before the Colonial Period. Even today, Venda society maintains a 21st century version of sacred leadership and class divisions. At the scale of the two models, then, the tempo of change was not continuous.

The rise of Mapungubwe has other elements of interest to the long-standing debate on the origins of states. Most importantly, neither conflict nor integrationist theories (following Tainter, 1988: 33) can adequately explain the developmental sequence.

The initial change in the economic base, for example, supports conflict theory, but according to 16th century eye-witness accounts (e.g. Dos Santos in Theal, volume 7), as well as Shona and Venda oral history, class divisions were maintained through consensus, rather than coercion. Among other institutions, southern African societies used a hierarchy of courts to help control both large and small territories. Historically known states, such as the Zulu, had a minimum of five court levels. These multiple levels placed the paramount in a third tier of chiefly authority and thus well-removed from the ordinary citizen. This degree of distance may be an important aspect of early states. It is not a defining characteristic, however, because level-5 organisations existed within southern Africa which were not class based (e.g. the Zulu). Social stratification and political stratification are thus not the same.

For those states with both social stratification and large territories, political leadership had a distinctive sacred character. Changes in rainmaking help to clarify the nature of sacred leadership.

Rainmaking and sacred leadership

To document changes in rainmaking, we need to consider material culture, in particular ceramic style and daga (mud) features. In terms of ceramics, K2 pottery dominated the region between about 1000 and 1200 AD, while classic *Mapungubwe* dates to between 1250 and 1300 AD. A new facies, called *Transitional K2*, fills the gap (Table 1). This transitional facies first occurs in the very upper levels of K2 and the lower occupation on the summit of Mapungubwe Hill (Huffman, 2007b; Meyer, 1980).

During this Transitional Period, Leopard's Kopje people changed the way they handled the residential zone of their homesteads: they began to add a thin (usually 2–5 cm) compacted grit/gravel surface around houses, grain bins and small stock kraals. I refer to this as a lapa surface. After this time, lapa surfaces are a regular feature.

Table 1
Mapungubwe dating sequence.

	Lab, BP	Pretoria	New Zealand
<i>Lose</i>			
Lose	(Beta 24516, 730 ± 50) (Beta 24515, 690 ± 60)	(1275–1305) 1285–1395	(1275–1320), 1355–1385 (1290–1325), 1340–1390
<i>Classic Mapungubwe</i>			
Mapungubwe Hill			
MK 4 (60–75 cm)	(Pta 6692, 720 ± 40)	1285–1305	1285–1315, (1355–1380)
Southern Terrace			
K8, L1iii (28 cm)	(Pta 1209, 770 ± 50)	1260–1295	1230–1255, 1260–1300, (1305–1375)
L2ii (64 cm)	(Pta 752, 790 ± 50)	1250–1290	1225–1290
Mtanye	(Pta 944, 720 ± 40)	1285–1305	1285–1315, (1355–1380)
Mutshilachokwe	(Pta 8996, 670 ± 60)	1290–1405	1300–1365, (1375–1395)
Weipe 508	(Pta 9549, 630 ± 70)	1300–1415	1305–1360, (1380–1415)
<i>Transitional K2</i>			
Mapungubwe Hill			
MK1, L11, (155 cm)	(Pta 1159, 840 ± 40)	1210–1270	1215–1270
(165 cm)	(Pta 1158, 850 ± 50)	1195–1270	1190, 1200–1275
MK3, L3, (35 cm)	(Pta 1145, 880 ± 40)	1175–1250	(1165–1170), 1175–1230, (1250–1260)
Block 6/4, (150 cm)	(Pta 372, 880 ± 45)	1170–1255	1160–1230, (1245–1265)
Southern Terrace			
E2, L5, (95 cm)	(Pta 437, 810 ± 45)	1230–1280	1225–1280
L7iii, (147 cm)	(Pta 438, 820 ± 60)	1210–1285	1210–1285
L10, (188 cm)	(Pta 439, 840 ± 50)	1200–1275	1210–1275
K8, L3, (88 cm)	(Pta 766, 860 ± 40)	1195–1260	1195, 1200–1270
L15, (285 cm)	(Pta 1156, 860 ± 40)	1195–1260	1195–1260
Mutshilachokwe	(Pta 8959, 910 ± 60)	(1040–1095), 1135–1235	(1050–1080), 1140–1230, 1255
Shutwater	(Pta 3734, 830 ± 40)	1215–1275	1220–1270
	(Pta 3715, 820 ± 45)	1220–1280	1225–1275
Tshobwane	(Pta 8969, 790 ± 60)	1235–1290	1215–1300, (1370)
	(Pta 9000, 890 ± 60)	1155–1250	1150–1265

NB (date), less likely spans.

They are also a feature on rainmaking hills during the Transitional Period. Both temperature and rainfall dropped below average (Smith, 2005: 156–161) at about the same time as the people moved from K2 to Mapungubwe. Significantly, hills in the region have a considerable amount of rainmaking deposit that dates to this period. The hill called EH (2229AD35) provides an example. As deposits there show (Schoeman, 2006a: chapter IX, 2006b), at least four and possibly five lapa surfaces were interdigitated with a temporary sheep/goat kraal, as well as the burnt remains of temporary grain bins.

By 1250 AD, rainfall had returned to relatively high levels (Smith, 2005: 156), and classic *Mapungubwe* pottery does not occur on rainmaking hills.

Another daga feature commands our attention. Throughout the sequence, normal houses were generally thatched rondavels with daga-plastered walls and a pounded floor about 10 cm thick. In contrast, elite housing was made out of 'Zimbabwe cement', that is solid-daga walls and hard, granular floors some 15–30 cm thick. The first elite housing appears on the summit of Mapungubwe Hill during the Transitional Period. The two special structures in the Western complex were the first (Fig. 8). They were located in between a natural rock cistern (Fig. 9) with two manufactured cupules inside (Nienaber and Hutten, 2006), and two large cisterns

with artificial cupules on the surface nearby. The elite housing was therefore built in the vicinity of an older rainmaking area. At the same time, isolated plastered surfaces, like those on the hill EH, occur 50–75 m away (Nienaber and Hutten, 2006, Figs. 210b–215b). Thus, while the first king lived on the western end of the hill, old style rainmakers were active in the centre. At some point, however, the Mapungubwe king became the rainmaker, praying to God through his ancestors. It is most significant then that the first stonewalled palace stood on top of this other rainmaking area. By the mid 13th century, professional rainmakers no longer used hills in the Mapungubwe area because sacred leaders had changed the system. Sacred leadership was now complete.

Changes in rainmaking included changes in theology. According to Horton (1967, 1975), religious systems in Africa that emphasise ancestors and spirits are associated with small-scale social structures with limited trade and limited multicultural interaction. In these societies, vision and interests concentrate on narrow matters of descent group and neighbourhood (Hammond-Tooke, 1986). As interaction spheres widen to embrace different cultural systems, however, the theological universe must also expand. In the case of Mapungubwe, international trade gradually widened the range of interaction and introduced new social issues. As social ranking intensified into class divisions, Leopard's Kopje people expanded the concept of God to embrace sacred leadership and the change in rainmaking.

We can speculate somewhat on the impact of the 1200–1250 AD droughts on this final materialisation of sacred leadership. If modern-day versions of sacred leadership are reliable guides (e.g. Stayt, 1931), then the return to high rainfall would have been interpreted as supernatural sanction for the new order. The old rainmaking system did not work, but the new one was highly successful. So successful that from this time on sacred leaders regularly placed their palaces on top of old rainmaking hills. Great Zimbabwe is the most famous example.

At about 1300 AD Mapungubwe and associated settlements in the region were abandoned, and Great Zimbabwe became the new power. I turn now to the rise of this famous centre.

Great Zimbabwe sequence

A large central hill supporting the Acropolis, or Hill Ruin, dominates the site today (Fig. 10). Excavations (Robinson, 1961a, 1961b) inside the palace, built during Period IVb, uncovered the



Fig. 8. The first elite housing at Mapungubwe, excavated by Gardner (standing) in 1939.



Fig. 9. Natural rock cistern with artificial cupules near the first elite housing on Mapungubwe Hill. Sandbags are part of rehabilitation project.



Fig. 10. The palace at Great Zimbabwe, built during Period IVb. Courtesy National Museums and Monuments of Zimbabwe.

most complete sequence. A comparison to Mapungubwe highlights the importance of the lower levels.

Underneath the palace walls, large granite boulders form uneven bedrock surfaces too small and too awkward for normal settlement. Here in deep pockets between boulders, Robinson found Early Iron Age pottery dating to about the same time as *Happy Rest*

in the Mapungubwe region (M-913, Table 2). The deposit contained a few burnt daga lumps but no evidence for actual housing (Fig. 11). The burnt daga points to drought conditions. Caton-Thompson (1931: 78–79) also found Early Iron Age pottery in deep pockets in her Test A3 west of the palace. In addition to granite boulders, the natural ground in A3 slopes steeply, and later Period

Table 2
Great Zimbabwe dating sequence.

	Lab, BP	Pretoria	New Zealand
<i>Period IVb (Great Zimbabwe)</i>			
HR TI, floor c	(M 915, 510 ± 75)	1410–1465	1395–1500, (1600–1605)
Nemanwa 3A8	(Pta 2429, 540 ± 40)	1410–1435	1410–1440
Z4 M1 (30–43 cm)	(Pta 2423, 550 ± 50)	1405–1435	1400–1445
Z4 M1 (71–83 cm)	(Wits 774, 600 ± 40)	1320–1345, (1395–1415)	1325–1345, (1390–1420)
Z1 H35	(Pta 1208, 600 ± 50)	1315–1350, (1390–1420)	1320–1345, (1385–1425)
HR TI, L7	(Pta 2706, 580 ± 50)	(1395–1425)	1330–1335, (1390–1440)
HR TI, L9	(Pta 1986, 640 ± 45)	1305–1405	1315–1355, (1380–1405)
HR WE lintel	(Pta 1192, 640 ± 40)	1305–1405	1305–1405
GE Wall 6 lintel	(Pta 1594, 640 ± 40)	1305–1405	1315–1355, (1380–1400)
GE Wall 6 lintel	(Pta 792, 650 ± 50)	1300–1405	1300–1405
<i>Period IVa (Z3/4)</i>			
HR TVI	(Pta 745, 670 ± 30)	1300–1320, (1345–1395)	1305–1330, 1335–1360 (1380–1390)
HR TI, L11 floor h1	(Pta 2704, 670 ± 45)	1295–1400	1305–1360, (1375–1390)
HR TI, L11 floor i	(Pta 1985, 690 ± 45)	1290–1320, (1350–1390)	1295–1325, (1345–1390)
GE T8, L6	(Pta 2694, 700 ± 40)	1290–1310, (1360–1385)	1290–1320, (1350–1385)
GE T5, L9	(Pta 2693, 710 ± 45)	1285–1310, (1360–1385)	1285–1320, (1350–1385)
HR TV, floor p	(Pta 2705, 760 ± 50)	1265–1295	(1235–1245), 1265–1310 (1360–1380)
<i>Period III (Zimbabwe 3)</i>			
HR TI, L12	(Pta 1984, 850 ± 50)	1200–1265	1190, 1200–1275
HR TI, L13	(M 914, 875 ± 75)	1155–1270	(1055–1060), 1150–1275
<i>Period II (Gumanye)</i>			
Undated at Great Zimbabwe			
<i>Period Ib (Zhizo)</i>			
HR TVI	(Pta 1983, 1280 ± 40)	710–865	720–740, 770–875
<i>Period Ia (Ziwa & Bambata)</i>			
HR TV, L3	(M 913*, 1630 ± 75)	400–555	410–565

NB. * The originally published date gives two standard errors: (date) = less likely spans.

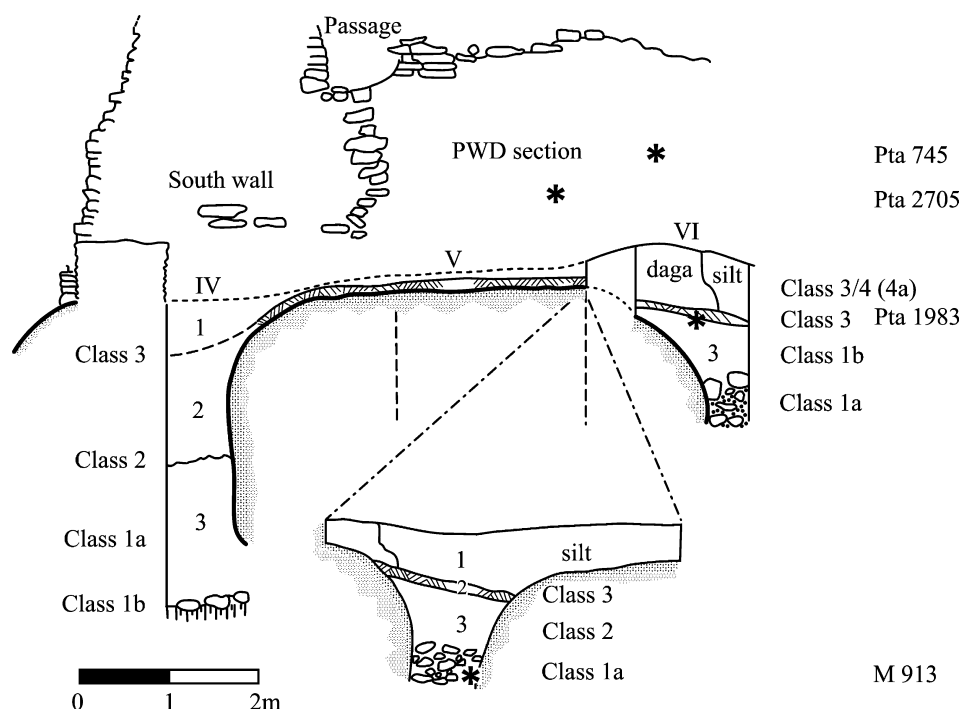


Fig. 11. Sections through Trench IV to VI inside the palace at Great Zimbabwe. After Robinson (1961a). Projected location of radiocarbon dates.

IV people had to construct stone terraces to create living space. Period Ia (following Huffman and Vogel, 1991), under the terraces, thus represents rainmaking activities rather than residence.

Period Ib is marked by *Zhizo* pottery in the same circumstances. Dating to the 8th century (Pta 1983), it was most probably the result of rainmaking activity when the Mapungubwe region was too dry for agriculture. This deposit also lay well below the palace walls.

During K2 times, there was at least one major drought in the Mapungubwe region, for hilltop deposits on Rhodes Drift (2229AA73) contain the burnt remains of temporary grain bins (Murimbika, 2006: plate 13.3) and a temporary goat kraal. Some K2 and contemporaneous *Leokwe* pottery occur together on a few other hilltops, while some burnt structures in ordinary homesteads (e.g. Pont Drift, Hanisch, 1980) indicate a drought at the beginning of the K2 period.

Similar evidence for rainmaking at this time also occurs in Period II deposits (Robinson, 1961a,b) at Great Zimbabwe. Undated here, similar *Gumanye* pottery elsewhere dates to between 1030 and 1250 AD (e.g. Gumanye Hill, Pta 1916). Period II deposits in Trench I (Fig. 12) at Great Zimbabwe lay some 60 cm underneath the earliest stonewalls.

We can interpret the beginning of Period III in a similar way. Level 13 in Trench I comprised 15–20 cm of dark ashy soil with *Zimbabwe* 3 (Z3) pottery and burnt pole-impressed daga, all dating to 1155–1270 AD (M 914). The deposit lay on a steep slope, and space was too restricted for a normal settlement in the near vicinity. The thin daga is best interpreted as the remains of burnt grain bins similar to rainmaking deposits in the Mapungubwe area. Level 13 therefore most likely marks the 1200–1250 droughts. This deposit also lay underneath the first stonewalls.

Although somewhat new, these rainmaking identifications for the lower levels on Zimbabwe Hill are unlikely to be controversial. The correspondence to rainmaking activities and climatic data in the Mapungubwe region is overwhelming.

The remaining Period III deposits require a different interpretation. After Level 13, the deposit changed. It is unclear whether floor fragments in Level 12 were derived from contemporaneous structures, another rainmaking episode or part of a fill to level out the slope. Thus the 13th century date (Pta 1984, Table 2) may be earlier than the fill. Whatever the case, floor j of Hut E represents a major structure built with 'Zimbabwe cement'. This structure was contemporaneous with a solid-daga platform (k1 Hut D) finished with a bevelled curb (Robinson, 1961a: 172–174). The drain between these two structures yielded the earliest gold anywhere from Great Zimbabwe. These two structures also begin the thick sequence of elite housing exposed by the Public Works Department in 1915 (Douslin, 1922). The daga floors in the PWD section form a sloping bank that supports the outer wall of the palace. Elite housing thus predates the first stone walling at Great Zimbabwe.

The dating of these earliest elite structures is critical (Tables 1 and 2). Robinson (letter to TNH 15 March 1980) collected charcoal from a thick daga floor (floor p) in the PWD section at 32" (71 cm) above the ground surface of his Trench V. The Pretoria lab dated it to between 1265 and 1295 AD (Pta 2705). If we calculate from Level 12 in Trench V to Trench I, then floor p was equivalent to somewhere between floor j and floor h1 in Level 11. In the same way, Pta 745 dates a level equivalent to h1. Charcoal associated with floor h1 dates to 1295–1400 AD (Pta 2704) and floor i to between 1290–1320 and 1350–1390 AD (Pta 1985). We can eliminate the later portions of these spans because of the stratigraphic relationship to other dates. More specifically, a wooden lintel from the back wall of the palace (Fig. 13), constructed in the early 'P' style (Whitty, 1961), dates to 1305–1405 AD (Pta 1192). Furthermore, two other lintels from a 'P' wall in the Great Enclosure have almost identical readings: 1300–1405 (Pta 792) and 1305–1405 (Pta 1594).

Another calibration curve for the southern hemisphere supports this interpretation. The New Zealand (NZ) curve (McCormac et al., 2004) differs in that it uses a variable factor, based on local trees, to

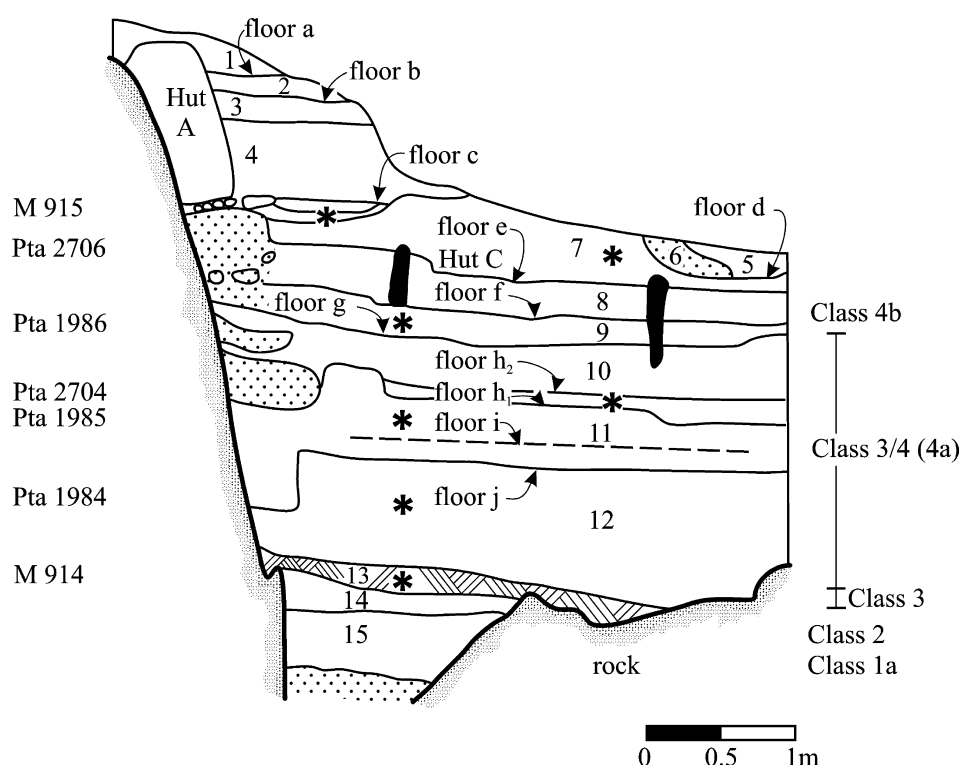


Fig. 12. Stratigraphic sequence in Trench I. After Robinson (1961a). Projected location of radiocarbon dates.

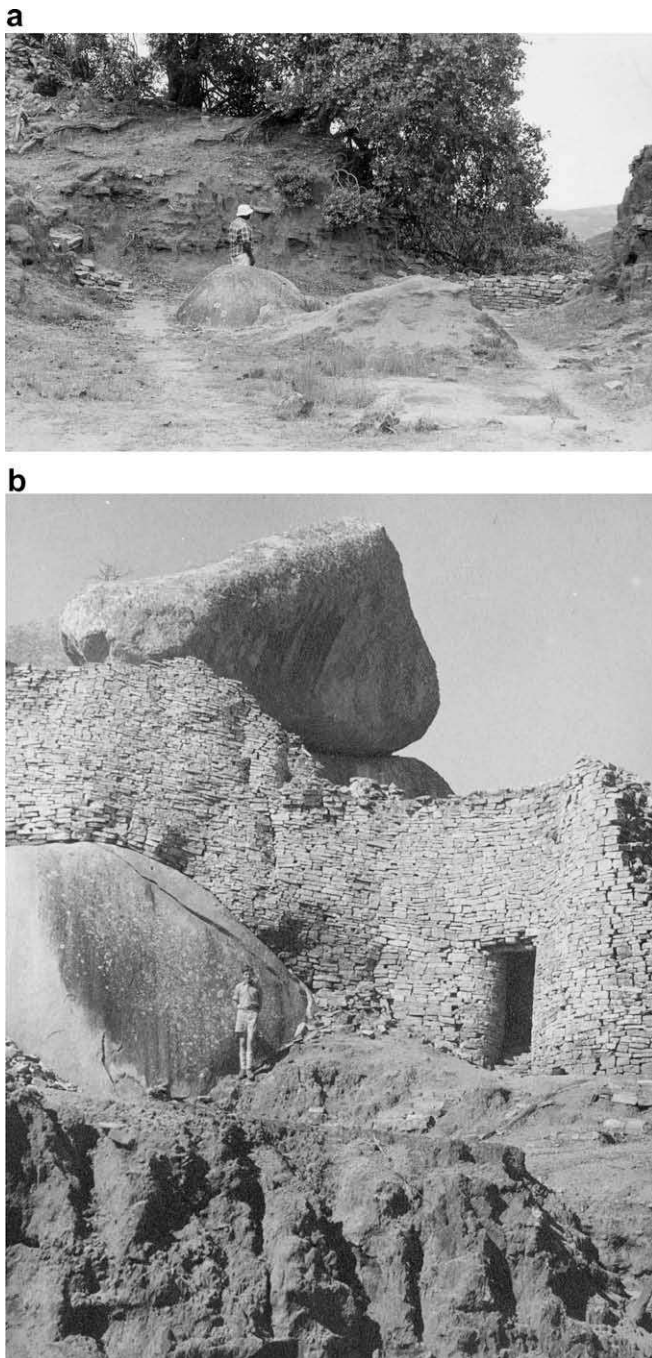
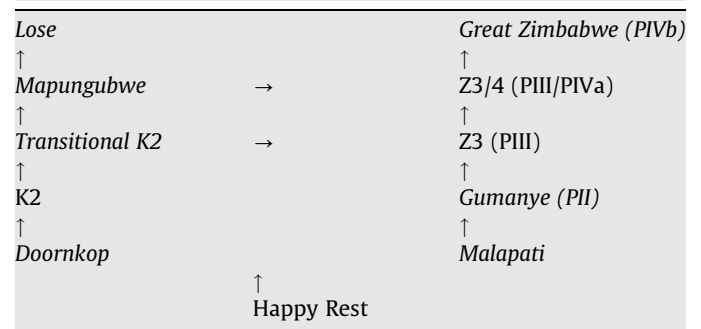


Fig. 13. The remains of elite housing exposed by the Public Works Department: (a) area of Trench IV–VI; (b) figure standing next to Trench I area before excavation. Passage in background yielded wooden lintel radiocarbon dated (Pta 1192) to 14th century.

adjust for the southern hemisphere. As Tables 1 and 2 show, the Pretoria and NZ results are remarkably similar, but the NZ curve provides more options. In both cases we can eliminate portions of some dates because of other data. Both curves show that the first elite housing at Great Zimbabwe dates after 1250 AD.

At this point we need to consider the relationship between the ceramics at Mapungubwe and Great Zimbabwe. We are most concerned with the Middle Iron Age sequences. Recent analyses (Huffman, 2007a) show that both facies derive from *Happy Rest* and belong to the widespread Kalundu Tradition. Their relationships can be illustrated in the following way:



The K2–Mapungubwe branch represents an internal development without obvious external influence. *Gumanye* to *Great Zimbabwe*, on the other hand, reflects the importance of Mapungubwe. Z3, for instance, incorporates a new decoration position (upper shoulder), a new motif category (inverted triangles) and a new surface treatment on jars (high burnish). Otherwise, Z3 continues the forms and finishes of *Gumanye* in Period II. Significantly, these new features first appeared in *Transitional K2*. It is at this time that Mapungubwe expanded its jurisdiction, for *Transitional K2* occurs at Bobonong (Kinahan et al., 1998) 100 km west of Mapungubwe, and it underlies classic *Mapungubwe* at Mapela Hill 90 km north-west (Garlake, 1968), Mtanye 90 km north and Mtetengwe (Robinson, 1958) 70 km to the east. *Transitional K2* also occurs at Mutshilachokwe and Tshobwane (Manyanga, 2007), Skutwater (Van Ewyk, 1987), Weipe 508 and the upper levels of Pont Drift (Hannisch, 1980; Huffman, 2000) in the immediate Mapungubwe region.

Mapungubwe's influence affected the whole of Period III. For example, Z3 pottery from beneath the Great Enclosure incorporates crosshatched triangles (Robinson, 1961b, Fig. 29) that first appear in classic *Mapungubwe*. Robinson called this pottery 'Class 3 influenced by Class 4' (Z3/4) because it also incorporates a graphite burnish characteristic of Period IV pottery. For similar reasons Huffman and Vogel (1991) called it Class 4a. At Montevideo Ranch (Robinson, 1958; Sinclair, 1986) to the west, Z3 underlies *Great Zimbabwe* pottery, dated to the 14th century (Pta 1920). The Z3 assemblage includes triangles as in *Transitional K2* and crosshatching as in *Mapungubwe*, but apparently not graphite. Unfortunately, so few vessels are decorated in any sample that a full definition of Z3 must await further research. It is nevertheless clear that the later Z3 (i.e. Z3/4) is contemporaneous with classic *Mapungubwe* and associated with elite housing.

Social explanations for the ceramic interaction need to consider linguistic relationships. According to Shona linguists (Fortune, 1959 and pers. comm. 1973), Kalanga (Western Shona) versus the Karanga cluster (Karanga, Manyika and Zezuru) is the oldest division within the Shona language family. On archaeological grounds (Huffman, 1974, 2007a) Leopard's Kopje people at K2 and Mapungubwe probably spoke some early form of Kalanga, while people at Great Zimbabwe probably spoke proto Karanga. This close linguistic relationship would have facilitated social interaction.

In southern Africa, marriage is a common means for transferring material culture (e.g. Evers and Hammond-Tooke, 1986). A new bride among Karanga people, for example, must take new items from her area to the home of her husband. Included in these items is a specific pot that represents her fertility (Aschwanden, 1982). This type of interaction among commoners would explain the spread of new ceramic types at places such as Montevideo Ranch.

The appearance of elite housing, on the other hand, requires alliances at a higher level. If solid-daga housing is a material expression of class distinction and elite power, as it probably was at Mapungubwe, then elites from Mapungubwe most likely moved

east to rule over a Karanga area. Such a move would also explain the *Mapungubwe*-derived attributes in Z3/4 pottery. Some particularly fine vessels could have even come from Mapungubwe. In addition to ceramics and elite housing, the stonewalling in Period IVb follows the pattern evolved at Mapungubwe. A Kalanga dynasty at Great Zimbabwe therefore explains some otherwise anomalous data.

We can speculate somewhat about this new dynasty. As an individual, the leader would have probably been a brother, uncle or close in-law of the king at Mapungubwe (following Beach, 1980). A small entourage would have accompanied him, including one of his own brothers to oversee the court and a senior sister to represent the female side of the ruling line (following Huffman, 1996b). Among other political strategies, the new dynasty would have incorporated the traditional leadership in the Great Zimbabwe area through marriage. Ultimately, because of its low numbers, the dynasty would have adopted the Karanga dialect. Similar processes were in operation when a Rozwi dynasty, speaking Kalanga, moved into Venda in the late 17th century. Archaic phrases of Kalanga are preserved today in a special court language only spoken in a chief's settlement (Van Warmelo, 1971).

In addition to more people, Mapungubwe leadership would have wanted a district representative at Great Zimbabwe because of the gold and ivory trade. A brief description of the trade network clarifies this point.

Trade links

In the 9th century, Swahili began to expand south to southern Tanzania. This expansion was connected to the spread of Islam and the development of harbours, ocean sailing vessels and trade with the Islamic world. When al-Masudi visited East Africa in

916 AD (Freeman-Grenville, 1962), ivory was exported to India and indirectly to China. Imported glass beads in several Early Iron Age sites show that the trade network had extended to southern Africa by the 8th and 9th centuries (Wood, 2000). Al-Masudi's 10th century record mentions gold from the land of Sofala. At this time, Sofala probably encompassed the Bazaruto Archipelago where archaeologists have identified early coastal trading stations that supplied glass beads to the interior (Sinclair, 1982). A later Sofala included present-day Beira in central Mozambique (Fig. 1). The distribution of ancient workings (Summers, 1969) shows that visible gold reefs were concentrated on the Zimbabwe plateau in greenstone belts not found in central or southern Mozambique. Thus, gold from the Land of Sofala had to come from its hinterland.

The most important port at the beginning of the Swahili trade is thought to have been Mogadishu in southern Somalia. The importance of Kilwa, south of Zanzibar, began to increase in the 12th century, and some 100 years later it was the seat of maritime power. A marked increase in international demand contributed to an upsurge in gold production in the 13th and 14th centuries. As a result, gold from Zimbabwe helped to support a boom at Kilwa. The distribution of Mapungubwe sites, *Mapungubwe* pottery in ancient workings (e.g. Jones, 1939) and Mapungubwe dates (Summers, 1969) from the Aboyne (SR 53, SR 58) and Geelong Mines (SR 143) show that the Mapungubwe state expanded north to control some of the gold fields (Fig. 14).

The international consumers responsible for the gold boom included the Far East. In addition to gold, the Chinese wanted ivory and leopard skins. In return Chinese celadon, a green-glazed stoneware, made its way to Mapungubwe and Great Zimbabwe.

Part of the Indian Ocean trade followed the rhythms of the monsoons. African items were taken from the interior to coastal stations such as Sofala where Swahili transported them up the coast

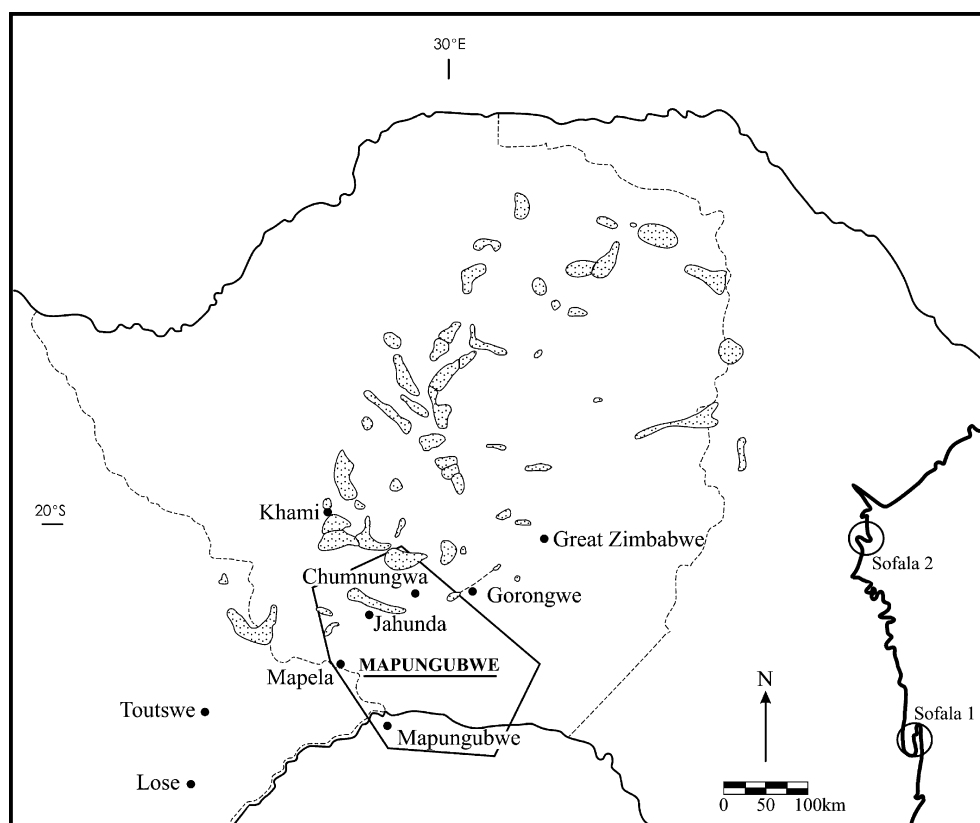


Fig. 14. The Mapungubwe state in relation to gold resources.

in dhows to Kilwa. After taxation, Arab traders sailed on the easterly monsoon to southern Arabia and India. There they exchanged the African items for glass beads, cloth and glazed ceramics. On the reverse monsoon, the sailors returned to Kilwa where they were taxed again, and then Swahili sailed down the coast to Sofala to begin another cycle.

The monsoon currents, however, come to an end slightly north of Kilwa. The remaining link to Sofala requires another cycle, so that in all, the coastal route took almost two years to complete. In contrast, an east/west route across the ocean, from South East Asia to Sofala, could be completed in a few weeks at any time of year. The return took about three months. Some beads in the Mapungubwe area have a South East Asian link (Wood, 2000, 2005). Traders used both the southern and coastal routes, and the Indian Ocean network was complex, involving Indians, Arabs, Swahili and Indonesians before the Portuguese.

It is the surplus wealth from this trade, and its associated multicultural interaction, that presented new opportunities and challenges to people in the Mapungubwe landscape. Glass beads in the Period II deposits show that external trade also encompassed the Great Zimbabwe area. Great Zimbabwe itself was near a minor gold area (Phimister, 1974), it could supply tribute in other important items and it was also closer to the coast. Thus, a Mapungubwe expansion to the east would be advantageous. With hindsight, the Period III leadership, at first subordinate to Mapungubwe, would be ideally positioned to take advantage of any misfortune at the capital.

End of Mapungubwe

At about 1300 AD, Mapungubwe people abandoned the valley. I previously associated this abandonment with the beginning of the Little Ice Age (Huffman, 1996a), but Denbow et al. (2007) challenge this interpretation on the basis of their work at Bosutswe and more recent climatic data from the stalagmite series at Makapansgat (Holmgren et al., 2003). They interpret these data to mean that climatic factors could not have played an important role in the decline of Mapungubwe. The climatic data from Makapansgat, however, still show that temperatures cooled and rainfall decreased. Furthermore, burnt structures at Mutshilachokwe, Mtanye, Toutswe and even Bosutswe mark a drought at about 1300. Bosutswe yielded particularly good evidence because a burnt daga layer there correlates with an arid isotopic reading (Denbow et al., 2007: 475). Thus, the agricultural base at Mapungubwe really would have been in jeopardy.

Several thousand people living in the region were more-or-less dependent on flood plain agriculture, and agricultural production was probably tightly scheduled. Lower rainfall and erratic flooding would therefore make a greater impact at this time than similarly poor conditions would have earlier.

What is more, the agricultural failure probably had serious political consequences. In Venda today, and in the recent past (e.g. Stayt, 1931), Raluvhimbi, that is God, makes Himself known through natural phenomena. Because sacred leaders were supposed to be chosen by God through the ancestors, natural disasters expressed supernatural displeasure in a king's rule. In all, the king would have been blamed for the agricultural problem, and his right to lead would have been challenged. This is a principle of sacred leadership in southern Africa.

This principle still operates today. A Venda informant, with a present-day version of sacred leadership, was recently asked to consider an agricultural failure at Mapungubwe (Murimbika, 2006: 163). From his perspective, the king at Mapungubwe was also a failure. Mapungubwe elders had probably misinterpreted the wishes of the ancestors, and another royal claimant would be

favoured. Typically, this other claimant would be ruling over a district some distance from the capital where conditions were better.

Whatever the outcome, a succession crisis would have made Mapungubwe politically vulnerable. From a strategic viewpoint, leaders at Great Zimbabwe, at the edge of the state, were poised to take over the trade. Furthermore, the locations of some Zimbabwe-type palaces, such as Chumungwa (2029DC1), Gorongwe (2030CC1) and Jahunda (2129AA1), show that by 1350 AD Great Zimbabwe had expanded deep into the southwest gold region. In all probability, then, the Mapungubwe state could not recover because Great Zimbabwe had undermined its economic base.

At least one Mapungubwe dynasty must have moved west into Botswana. Mapungubwe-derived ceramics (called *Lose*) have been found in association with a stonewalled palace in the saddle of Lose Hill (Kiyaga-Mulinda, 1990). The Lose levels date to the 14th century (Beta 24516, Beta 24515). This is the only known Mapungubwe palace contemporaneous with Zimbabwe Period IVb, and I suspect the dynasty moved here to avoid the new Zimbabwe state. Ultimately, they were out-competed.

Some researchers have wondered whether Great Zimbabwe provided stiff competition before the Lose Period and end of Mapungubwe dominance. Sufficient data are available to cast doubt on this proposal. Z3 and Z3/4 pottery, for instance, have limited distributions both in and outside Great Zimbabwe. Great Zimbabwe pottery, on the other hand, covers a broad area. This pottery, that is Class 4b, first appeared in Levels 7, 8 and 9 in Test I, at the same time as the first stonewalling. The overlap of relevant radiocarbon measurements for the walling and pottery dates the beginning of the town to about 1300 AD. On present evidence, *contra* Chipunza (1994: 44, 53), there is no support whatsoever for stonewalling during Period III. Thus, Great Zimbabwe did not become especially important until it took over the trade from Mapungubwe. Both the Pretoria and New Zealand calibration curves suggest that Great Zimbabwe leaders out-competed Mapungubwe within a single generation.

Another point about the walling is worth restating. Instead of independent steps, Zimbabwe walling followed the pattern first developed at Mapungubwe: elite housing on terraced slopes surrounded the hilltop palace; a public court stood at the bottom without an associated cattle kraal; and many commoners lived to the west, mostly outside a west-facing perimeter wall. Even the different styles of walling used for different functions (Whitty, 1961) had precursors at Mapungubwe. The Mapungubwe origin of the first Zimbabwe dynasty probably insured that the layout of the new capital would follow the older pattern.

In addition to the town layout, the Mapungubwe dynasty would have introduced a system of symbols associated with the new ideology. Some of these are preserved in the material record.

Ideological symbols

Throughout the Zimbabwe culture area, crocodiles were metaphorically linked to sacred leadership. The phrase 'the crocodile does not leave its pool', for example, refers to the ritual seclusion of a Venda chief (Van Warmelo, 1971). Other instances of this link occurred among Shona speakers in Zimbabwe (Huffman, 1996b: 28–34), but not Sotho-Tswana or Nguni people. Overall, crocodiles behave like sacred leaders in that they are dangerous, ferocious and fear no enemies. Further, they live both in and out of water, and to a great age. For these reasons, they are linked to rain and wisdom. Equally important, they are mediators, communicating with the ancestral world at the bottom of deep pools.

In Venda court art (Nettleton, 1984), several media express this metaphorical link through geometric designs, such as variations of circle-and-dot motifs, nested diamonds, cross-hatching and multi-

ple pitted designs. Pitted designs in particular represent the bumps and hollows of a crocodile's skin. For this reason, crocodiles in the middle of wooden divination bowls are sometimes covered in pits. The 19th century bowl found near Great Zimbabwe provides a good example (Bent, 1896, opposite title page). On Khami palace walls (1840–1450 AD), the pitted skin of the crocodile was most probably the icon for check designs. Likewise, the ridges on a crocodile's back most likely inspired dentelle designs (Fig. 15) on Zimbabwe palace walls (1450–1300 AD).

Ceramic vessels suggest that similar designs had similar meanings at Mapungubwe. Early investigators (Fouché 1937: 74–75) found two specially well-made vessels on the summit in the royal graveyard. A highly burnished red bowl from Grave 11 bears three panels of raised ridges between long zones of deep punctates (Fig. 16). The raised ridges are similar in design to dentelle decoration on palace walls, while the punctates are similar to the check design representing a crocodile's pitted skin. In the second case, a highly burnished black bowl bears a band of three crosshatched diamonds similar to the representation of crocodiles on Shona divining dice: one diamond for the head, one for the body and one for the tail (Nettleton, 1984).

Because specific designs in specific circumstances most likely had similar meanings for some 600 years (Huffman, 1996b), it is reasonable to interpret the Mapungubwe examples in the same way. If reasonable, the metaphorical link probably began during the Transitional Period, and it was well established by classic Mapungubwe times. The crosshatched triangles in Z3/4 pottery suggest it was present at Great Zimbabwe with the first elite housing.



Fig. 15. Dentelle (crocodile) design in the palace at Great Zimbabwe. Courtesy National Museums and Monuments of Zimbabwe.

Crocodiles were part of a wider set of symbols that included snakes as well as gender divisions. The previous examples were nevertheless sufficient to show that the metaphorical link between crocodiles and sacred leadership probably began at Mapungubwe. Indeed, the ideological uniformity within the Zimbabwe culture was most likely due, at least in part, to its origin and spread from that first centre.

Because of its origins, however, sacred leadership at Great Zimbabwe would have had a problem of legitimacy. Old style rainmaking in Level 13 shows that Zimbabwe society was still based on social ranking while class distinction and sacred leadership were crystallising at Mapungubwe. Because ordinary Zimbabwe people did not participate in this evolution, the original Mapungubwe dynasty must have imposed sacred leadership and class distinction on them. Consequently, once Zimbabwe leaders were no longer backed by the power of Mapungubwe, the new social organisation required legitimacy. To sanctify this alien system, Zimbabwe royalty could not simply glorify themselves; they needed to emphasise the link between their ancestors and God.

The Zimbabwe birds appear to have been one of the measures developed for this purpose. My final topic concerns these remarkable symbols.

By combining a raptor theme with human elements (Garlake, 1973), the soapstone birds were a metaphor in stone for the intercessory role of royal ancestor spirits. One bird, for instance, has lips rather than a beak, and toes, or fingers, rather than talons (Fig. 17). In fact, all have masculine limbs, and most have four or five toes, instead of three talons forward and two back like most raptors.

In the Zimbabwe culture royal ancestor spirits were supposed to be mediators. Indeed, the spirits of former kings were said to travel between earth and heaven, like eagles, interceding with God on behalf of the nation for problems that affected everyone. Rain was the pre-imminent concern.

In Zimbabwe ritual today, each important ancestor must be named separately. Because each carving is different, the stones probably represented individual ancestors (Summers, 1963), both male and female (Huffman, 1996b: 134–136). Although separate ancestors, they may not have commemorated actual leaders who had ruled at Great Zimbabwe. For this purpose, we would expect the birds to have been carved in sequence as each leader passed into the ancestral world. The styles and workmanship, however, suggest that all the stones in the palace were carved at one time (I exclude the one birdstone from the lower valley). It follows that the birdstones probably commemorated Zimbabwe leaders before the rise of Great Zimbabwe. In effect, by glorifying previous leaders, nobles 'back-dated' sacred leadership to make it appear normal, that is, to make new claims appear old.

This process is also the reason why such bird carvings have been found only at Great Zimbabwe. Great Zimbabwe was the capital of a large state for about 150 years, two to three times as long as Mapungubwe. During this time, the Zimbabwe culture spread over an area three to six times larger than Mapungubwe con-

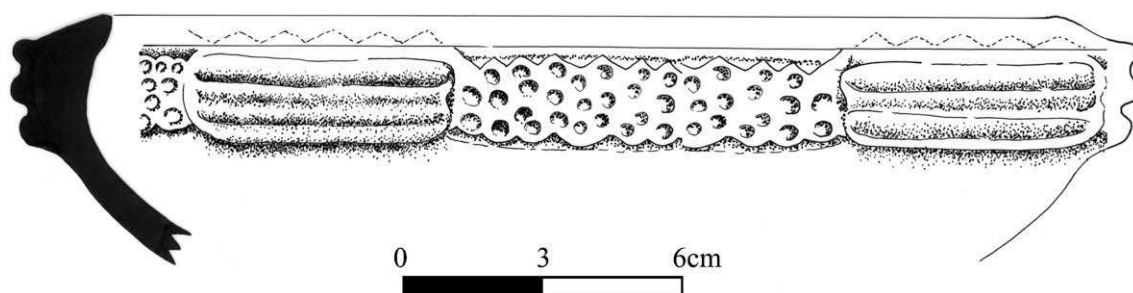


Fig. 16. Ceramic vessel from Mapungubwe with crocodile designs.



Fig. 17. Soapstone bird from Great Zimbabwe. Note lips, toes and masculine legs. Courtesy National Museums and Monuments of Zimbabwe.

trolled, and the royal class expanded accordingly. By the time Great Zimbabwe was abandoned, virtually every ruling dynasty throughout the culture area, both Kalanga and Karanga, was already integrated into an upper class. Because class distinction and sacred leadership were old concepts by then, it was unnecessary to reinvent the link to God at each new capital.

The Zimbabwe birds were therefore specifically involved with the transfer of power from Mapungubwe to Great Zimbabwe. Among other meanings, these symbols were part of the ideology of rainmaking.

Summary

As this discussion shows, the rise of Great Zimbabwe was directly linked to events and processes in the Mapungubwe region. In the beginning, intensive agriculture and surplus trade wealth helped to transform Leopard's Kopje society from a ranked, kin-based system to social classes and sacred leadership. Spatial analyses were particularly useful in documenting this transformation. The first spatial change, the shift of cattle out of the centre of K2, probably represents the beginning of class distinction. The second change, the shift of leadership onto Mapungubwe Hill, probably represents the full materialisation of class distinction and the beginning of sacred leadership. Although old-style rainmakers were still active, they were soon displaced. The third spatial change, placing the stonewalled palace on top of the rainmaking area, represents the crystallisation of sacred leadership. Sacred leaders were now the rainmakers.

At Great Zimbabwe, the lower levels were also the result of old-style rainmaking. Level 13, with the first Z3 pottery, corresponds to the dry episodes at Mapungubwe during the Transitional Period.

Level 12, in contrast, begins the series of solid-daga structures that were contemporaneous with the palace at Mapungubwe. These first elite structures mark the appearance of district leaders from Mapungubwe.

Later, natural disasters in the Mapungubwe region probably contributed to political instability, and leaders at Great Zimbabwe were able to take over local control of the gold and ivory trade. Enormous wealth from this trade supported the development of Great Zimbabwe. Elite housing, ceramic design and the town layout show that the Mapungubwe-derived dynasty had introduced sacred leadership and class distinction. Once free from Mapungubwe hegemony, the new leadership needed to manipulate ideological symbols associated with God and rain to legitimate their authority in the eyes of the commoners.

As this case study shows, Mapungubwe and Great Zimbabwe shared many of the classic characteristics of early states. Among others, sacred leadership validated a bureaucratic upper class. Most importantly, leadership in southern Africa became linked to the supernatural through processes that involved rainmaking.

Acknowledgments

I thank Leon Jacobson, Karim Sadr and Gavin Whitelaw for comments. Wendy Voorvelt prepared the illustrations. The archaeological survey was sponsored by the Indigenous Knowledge Section of the South African National Research Foundation, and made possible by the cooperation of South African National Parks and local landowners. The Mellon Foundation helped to sponsor the ethnoarchaeological project of Murimbika, while the De Beers Trust funded much of Schoeman's research.

References

- Aschwandien, H., 1982. *Symbols of Life*. Mambo Press, Gweru, Zimbabwe.
- Beach, D.N., 1980. *The Shona and Zimbabwe 900–1850*. Mambo Press, Gweru (Zimbabwe).
- Beach, D.N., 1998. Cognitive archaeology and imaginary history at Great Zimbabwe. *Current Anthropology* 39, 47–72.
- Bent, J.T., 1896. *The Ruined Cities of Mashonaland*. Longmans, third edition. Green, London.
- Bourdieu, P., 1977. *Outline of a Theory of Practice*. Cambridge University Press, Cambridge.
- Calabrese, J.A., 2000. Interregional interaction in southern Africa: Zhizo and Leopard's Kopje relations in northern South Africa, southwestern Zimbabwe and eastern Botswana, AD 1000–1200. *African Archaeological Review* 17 (4), 183–210.
- Calabrese, J.A., 2007. The Emergence of Social and Political Complexity in the Shashi–Limpopo Valley of Southern Africa, AD 900–1300. *Ethnicity, Class, and Polity*. (BAR International Series 1617. Cambridge Monographs in African Archaeology 69). Archaeopress, Oxford.
- Caton-Thompson, G., 1931. *The Zimbabwe Culture: Ruins and Reactions*. Clarendon Press, Oxford.
- Chipunza, K.T., 1994. A Diachronic Analysis of the Architecture of the Hill Complex at Great Zimbabwe. (Studies in African Archaeology 8). Societa Archaeologica Upsaliensis, Uppsala.
- Denbow, J.R., Smith, J., Ndobochani, N.M., Atwood, K., Miller, D., 2007. Archaeological excavations at Bosutswe, Botswana: cultural chronology, paleo-ecology and economy. *Journal of Archaeological Science* 35, 459–480.
- Douslin, H.B., 1922. Recent explorations at Zimbabwe. *Proceedings of the Rhodesia Scientific Association* 20, 61.
- Evers, T.M., Hammond-Tooke, D., 1986. The emergence of South African chiefdoms: an archaeological perspective. *African Studies* 45, 37–42.
- Fortune, G., 1959. A Preliminary Survey of the Bantu Languages of the Federation (Rhodes Livingstone Communication 14).
- Fouché, L. (Ed.), 1937. *Mapungubwe: Ancient Bantu Civilization on the Limpopo*. Cambridge University Press, Cambridge.
- Fredriksen, P.D., 2007. Approaching intimacy: interpretations of changes in Moloko household space. *South African Archaeological Bulletin* 62, 126–139.
- Freeman-Grenville, G.S.P., 1962. *The East African Coast: Selected Documents from the First to the Earlier Nineteenth Centuries*. Clarendon Press, Oxford.
- Gardner, G.A., 1963. *Mapungubwe: Volume II*. J.L. Van Schaik, Pretoria.
- Garlake, P.S.G., 1968. Test excavations at Mapela Hill, near the Shashi River, Rhodesia. *Arnoldia (Rhodesia)* 3 (34), 1–29.
- Garlake, P.S.G., 1973. *Great Zimbabwe*. Thames and Hudson, London.
- Giddens, A., 1984. *The Constitution of Society: Outline of a Theory of Structuration*. Polity Press, Cambridge.

- Hall, S.L., 1998. A consideration of gender relations in the Late Iron Age “Sotho” sequence of the Western Highveld, South Africa. In: Kent, S. (Ed.), *Gender in African Prehistory*. AltaMira Press, Walnut Creek, CA, pp. 235–258.
- Hammond-Tooke, W.D., 1986. The aetiology of spirit in southern Africa. *African Studies* 45, 157–170.
- Hanisch, E.O.M., 1980. An Archaeological Interpretation of Certain Iron Age Sites in the Limpopo/Shashi Valley. Masters thesis, University of Pretoria.
- Holmgren, K., Lee-Thorp, J.A., Cooper, G.R., Lundblad, K., Partridge, T.C., Scott, L., Sithaldeen, R., Talma, A.S., Tyson, P.D., 2003. Persistent millennial-scale climatic variability over the past 25,000 years in Southern Africa. *Quaternary Science Reviews* 22, 2311–2326.
- Horton, R., 1967. African traditional thought and Western science. *Africa* 37, 50–71.
- Horton, R., 1975. On the rationality of conversion. *Africa* 45, 373–398.
- Huffman, T.N., 1974. The Leopard's Kopje Tradition. National Museums and Monuments of Rhodesia, Salisbury (Museum Memoir 6).
- Huffman, T.N., 1982. Archaeology and ethnohistory of the African Iron Age. *Annual Review of Anthropology* 11, 133–150.
- Huffman, T.N., 1986. Iron Age settlement patterns and the origins of class distinction in southern Africa. In: Wendorf, F., Close, E. (Eds.), *Advances in World Archaeology* 5. Academic Press, New York, pp. 291–338.
- Huffman, T.N., 1996a. Archaeological evidence for climatic change during the last 2000 years in Southern Africa. *Quaternary International* 33, 55–60.
- Huffman, T.N., 1996b. Snakes & Crocodiles: Power and Symbolism in Ancient Zimbabwe. Witwatersrand University Press, Johannesburg.
- Huffman, T.N., 2000. Mapungubwe and the origins of the Zimbabwe culture. In: Leslie, M., Maggs, T. (Eds.), *African Naissance: The Limpopo Valley 1000 Years Ago*. (South African Archaeological Society Goodwin Series 8), pp. 14–29.
- Huffman, T.N., 2001. The Central Cattle Pattern and interpreting the past. *Southern African Humanities* 13, 19–35.
- Huffman, T.N., 2004. Beyond data: The aim and practice of Archaeology. *South African Archaeological Bulletin* 59, 66–69.
- Huffman, T.N., 2007a. Handbook to the Iron Age: The Archaeology of Pre-colonial Farming Societies in Southern Africa. University of KwaZulu-Natal Press, Pietermaritzburg.
- Huffman, T.N., 2007b. Leokwe and K2: ethnic stratification during the Middle Iron Age in southern Africa. *Journal of African Archaeology* 5 (2), 3–27.
- Huffman, T.N., 2008. Climate change during the Iron Age in the Shashe–Limpopo Basin, southern Africa. *Journal of Archaeological Science* 35, 2032–2047.
- Huffman, T.N., Vogel, J.C., 1991. The chronology of Great Zimbabwe. *South African Archaeological Bulletin* 46, 61–70.
- Jones, N., 1939. A brief account of the finds made on the Macardon Claims, West Nicholson, Gwanda District, Southern Rhodesia. *Proceedings Rhodesia Scientific Association* 37, 57–61.
- Kinahan, J., Kinahan, J.H.A., Van Waarden, C., 1998. The archaeology and symbolic dimensions of a thirteenth century village in eastern Botswana. *Southern African Field Archaeology* 7, 63–71.
- Kiyaga-Mulindwa, D., 1990. Excavations at Lose Enclosure central Botswana. In: Sinclair, J.J., Pwiti, G. (Eds.), *Urban Origins in Eastern Africa: Proceedings of the 1990 Workshop Harare and Great Zimbabwe*. (Project Working Paper No. 6). Swedish Central Board of National Antiquities, Stockholm, pp. 48–59.
- Kopytoff, I., 1989. *The African Frontier: The Reproduction of Traditional African Societies*. Indiana University Press, Bloomington.
- Kloppers, M., in preparation. The Archaeozoology of the Middle Iron Age in the Shashe–Limpopo Basin. Masters thesis, University of the Witwatersrand, Johannesburg.
- Kuper, A., 1982. *Wives for Cattle: Bridewealth and Marriage in Southern Africa*. Routledge and Kegan Paul, London.
- Lane, P., 1998. Engendered spaces and bodily practices in the Iron Age of southern Africa. In: Kent, S. (Ed.), *Gender in African Prehistory*. AltaMira Press, Walnut Creek, CA, pp. 179–203.
- Lane, P., 2005. Barbarous tribes and unrewarding gyrations? The changing role of ethnographic imagination in African archaeology. In: Stahl, A.B. (Ed.), *African archaeology. A Critical Introduction*. Blackwell, Oxford, pp. 24–54.
- Legassick, M., 1969. The Sotho-Tswana peoples before 1800. In: Thompson, L. (Ed.), *African Societies in Southern Africa*. Heinemann, London, pp. 86–125.
- Maggs, T., 1976. Iron Age Communities of the Southern Highveld. Natal Museum, Pietermaritzburg (Occasional Publication 2).
- Manyanga, M., 2007. Resilient Landscapes: Socio-environmental Dynamics in the Shashi-Limpopo Basin, southern Zimbabwe c. AD 800 to the present. (Studies in Global Archaeology 11). Department of Archaeology and Ancient History, Uppsala.
- McCarthy, T., Rubidge, B., 2005. *The Story of Earth & Life: A southern African perspective on a 4.6-Billion-Year Journey*. Struik, Cape Town.
- McCormac, F.G., Hogg, A.G., Blackwell, P.G., Buck, C.E., Higham, T.F.G., Reimer, P.J., 2004. SHCal04 Southern Hemisphere Calibration 0–11.0 cal kyr BP. *Radiocarbon* 46, 1087–1092.
- McGuire, R.H., 1996. Why complexity is too simple. In: Meyer, D.A., Dawson, P.C., Hanna, D.T. (Eds.), *Debating Complexity*. Proceedings of the 26th Annual Chacmool Conference. The Archaeological Association of the University of Calgary, Calgary, pp. 23–29.
- Meyer, A., 1980. 'n Interpretasie van die Greefswald Potwerk. Master's dissertation, University of Pretoria.
- Meyer, A., 1998. *The Archaeological Sites of Greefswald: Stratigraphy and Chronology of the Sites and a History of Investigations*. University of Pretoria, Pretoria.
- Mitchell, P., 2002. *The Archaeology of Southern Africa*. Cambridge University Press, Cambridge.
- Murimbika, M.T., 2006. Sacred Powers and Rituals of Transformation: An Ethnoarchaeological Study of Rainmaking Rituals and Agricultural Productivity During the Evolution of the Mapungubwe State, AD 1000 to AD 1300. Doctoral thesis, University of the Witwatersrand, Johannesburg.
- Nettleton, A.C.E., 1984. *The Traditional Woodcarving of the Venda and Shona*. Doctoral thesis, University of the Witwatersrand, Johannesburg.
- Nienaber, W.C., Hutten, M., 2006. The 2003 Mapungubwe Stabilization Project. University of Pretoria, Pretoria.
- Phimister, I.R., 1974. Ancient mining near Great Zimbabwe. *Journal of the South African Institute of Mining and Metallurgy* 74, 233–237.
- Pikirayi, I., 2000. *The Zimbabwe Culture: Origins and Decline of Southern Zambezi States*. AltaMira Press, Walnut Creek, CA.
- Pwiti, G., 2005. Southern Africa and the East African Coast. In: Stahl, A.B. (Ed.), *African Archaeology: A Critical Introduction*. Blackwell Publishing, Malden, MA, pp. 378–391.
- Robinson, K.R., 1958. Four Rhodesian Iron Age sites: a brief account of stratigraphy and finds. *Occasional Papers National Museum of Southern Rhodesia* 3A (22), 77–119.
- Robinson, K.R., 1961a. Excavations on the Acropolis Hill. *Occasional Papers National Museum of Southern Rhodesia* 3A (23), 159–192.
- Robinson, K.R., 1961b. Zimbabwe Pottery. *Occasional Papers National Museum of Southern Rhodesia* 3A (23), 193–226.
- Schoeman, M.H., 2006a. Clouding Power? Rain Control Space, Landscapes and Ideology in Shashe–Limpopo State Formation. Doctoral thesis, University of the Witwatersrand, Johannesburg.
- Schoeman, M.H., 2006b. Imagining rain-places: rain-control and changing ritual landscapes in the Shashe–Limpopo Confluence Area, South Africa. *South African Archaeological Bulletin* 61, 152–165.
- Sinclair, P., 1982. Chibueni: An early trading site in southern Mozambique. *Paideuma* 28, 150–164.
- Sinclair, P., 1986. Excavations at Montevideo Ranch. Department of Archaeology and Ancient History, Uppsala (Working Papers in African Studies 18).
- Smith, J., 2005. Climate Change and Agropastoral Sustainability in the Shashe–Limpopo River Basin from AD 900. Doctoral thesis, University of the Witwatersrand, Johannesburg.
- Smith, J., Lee-Thorp, J., Hall, S., 2007. Climate change and agropastoralist settlement in the Shashe–Limpopo river basin. *South African Archaeological Bulletin* 62, 115–125.
- Steyn, H.A., 1931. *The Bavenda*. Oxford University Press for the International African Institute, Oxford.
- Summers, R., 1963. *Zimbabwe: A Rhodesian Mystery*. Nelson, Cape Town.
- Summers, R., 1969. Ancient Mining in Rhodesia and Adjacent Areas. National Museums of Rhodesia, Salisbury (Museum Memoir 3).
- Tainter, J.A., 1988. *The Collapse of Complex Societies*. Cambridge University Press, Cambridge.
- Theal, G.M., 1898–1903. *Records of South-Eastern Africa* (9 volumes). Government of the Cape Colony, London.
- Tyson, P.D., Karlen, W., Holmgren, K., Heiss, G., 2000. The Little Ice Age and Medieval Warming in South Africa. *South African Journal of Science* 96, 121–126.
- Van Ewyk, J.F., 1987. *The Prehistory of an Iron Age Site on Skutwater*. Masters Thesis, University of Pretoria, Pretoria.
- Van Warmelo, N.J., 1971. Courts and court speech in Venda. *African Studies* 30, 355–370.
- Vogel, J.C., Talma, A.S., Fuls, A., Fisser, E., Becker, B., 1993. Pretoria calibration curve for short lived samples, 1930–3350 BC. *Radiocarbon* 35, 73–86.
- Vogel, J.C., Calabrese, J.A., 2000. Dating of the Leokwe Hill site and its implications for the regional chronology. In: Leslie, M., Maggs, T.M. (Eds.), *African Naissance: The Limpopo Valley 1000 Years Ago*. (South African Archaeological Society Goodwin Series 8), pp. 47–50.
- Voigt, E.A., 1983. Mapungubwe: An Archaeozoological Interpretation of an Iron Age Community. Transvaal Museum, Pretoria (Museum Monograph 1).
- Whitty, A., 1961. Architectural style at Zimbabwe. *Occasional Papers National Museum of Southern Rhodesia* 3A (23), 289–305.
- Wood, M., 2000. Making connections: relationships between international trade and glass beads from the Shashe–Limpopo area. In: Leslie, M., Maggs, T.M. (Eds.), *African Naissance: The Limpopo Valley 1 000 Years Ago*. (South African Archaeological Society Goodwin Series 8), pp. 78–90.
- Wood, M., 2005. Glass Beads and Pre-European Trade in the Shashe–Limpopo Region. Masters thesis, University of the Witwatersrand, Johannesburg.