New AMS dates for the Middle Iron Age in the Mapungubwe landscape

Research in the Limpopo Valley has documented over 500 Middle Iron Age sites (AD 900–1320) relevant to the origins of Mapungubwe – the capital of the first indigenous state in southern Africa. Fifteen new accelerator mass spectrometry (AMS) dates from 11 of these archaeological sites establish the boundaries of the ceramic facies that form the culture-history framework for such diverse topics as land use, ethnic stratification, population dynamics and rainfall fluctuations. Mapungubwe was abandoned at about AD 1320.

Significance:
• Because Mapungubwe developed relatively recently (circa AD 1200), it can clarify the origins of older states.
• Environmental factors such as droughts, along with agriculture and trade, played a role in the abandonment of Mapungubwe.

Mapungubwe was the capital of the first indigenous state in southern Africa, laying the foundations for Great Zimbabwe. Mapungubwe belongs to the Iron Age, a 1500-year long era dominated by Bantu-speaking farmers. By convention, archaeologists divide this era into three arbitrary periods: the Early Iron Age (AD 300–900), the Middle Iron Age (AD 900–1300) and the Late Iron Age (AD 1300–1840). Characteristic ceramic facies form the basis of the culture-history sequence. Although problematic in terms of real cultural groups, it is another convention to apply the facies name to people who produced the style: thus, Mapungubwe people produced the Mapungubwe style.

For the origins of Mapungubwe, the most important period is the Middle Iron Age. Stratigraphic relationships for this period have helped to produce a definitive ceramic sequence (Figure 2): it includes the facies known as Zhizo, Leokwe, K2, Transitional K2 (TK2) and Mapungubwe.

Figure 1: New accelerator mass spectrometry (AMS)-dated sites within the Mapungubwe landscape.

Origins of Mapungubwe Project

Since 1999, foot surveys in the Mapungubwe National Park and surrounding Buffer Zone have recorded some 1150 Iron Age sites. This large number has helped to clarify different land uses, ethnic stratification, population dynamics and droughts. As part of our project, we have processed 15 new accelerator mass spectrometry (AMS) dates from 11 Middle Iron Age sites and other researchers have produced a few more3-5 (Table 1). We report them here by ceramic facies and research topic.

For Table 1, we first calibrated the BP (Before Present) dates using Calib 8.10 and the Southern Hemisphere data set (SHCal20) using Stuiver and Reimer6 and Hogg et al.7 This calibration programme includes the median age for the radiocarbon date, but this often falls outside the 1-sigma range.
Furthermore, the radiocarbon curve fluctuates markedly during the Middle Iron Age, so that one radiocarbon result may have two or more possible calendar dates. To help choose between different calibration spans, we consider the midpoints of the 1-sigma ranges along with the known stratigraphic sequence and then order the possibilities. Thus, a hypothetical date of BP 1000 ± 1 calibrates to AD 1033–1048 for sites with K2 ceramics but to AD 1120–1137 for the TK2 facies.

The Middle Iron Age

According to isotopic analysis, when Zhizo people moved into the Limpopo Valley from southwest Zimbabwe at about AD 900, the climate was similar to that today. This means that Zhizo people would have found farming difficult, and some other reason probably accounts for their presence. Ivory artefacts and imported glass beads at Schroda and the locations of other Zhizo sites indicate that these people may have purposefully moved into the basin to hunt elephants for the ivory trade.

Land use

At about AD 1000, or slightly later, Leopard’s Kopje people established their capital at the site K2 near the Shashe-Limpopo confluence in South Africa. In contrast to the earlier Zhizo phase, Leopard’s Kopje people began to cultivate the margins of the large vlei there (Figure 1).

Models of vlei and riverbed cultivation in Zimbabwe suggest that they planted sorghums in the rich loams along the wet edges and millets on the sandy fluvial terraces. In typical farming homesteads, many grainbin foundations encircle a central cattle kraal (e.g. Liz 197: IT-C-2042; Edmondsberg 157: IT-C-2047). Besides these homesteads, some settlements were cattle posts located on spurs near springs on the escarpment, or otherwise well away from agricultural land (e.g. on Schroda: IT-C-2041). In addition, field camps were located near agricultural land but on small hills and rises in situations unsuitable for settled villages; they have granaries, small stock kraals and middens, but lack permanent housing and cattle kraals. Rainmaking hills are a fourth kind of site.

Ethnic interaction

When K2 people took over the valley, many Zhizo people went west to Botswana to become the Toutswe group. Some Zhizo people, however, stayed behind to live within the K2 interaction sphere. Because their ceramic style has changed somewhat, it is called Leokwe after the hill where it was first recognised. A Leokwe site in the Venetia Reserve, KK110, upstream of the vlei, has been AMS dated (IT-C-2038) to the 10th century, somewhat earlier than most dates. Antonites added three new dates for the Leokwe levels at Schroda, one of which is also early.

![Figure 2: Ceramic sequence for the Middle Iron Age in the Mapungubwe landscape.](image-url)
These dates show that Zhizo ceramics began to change into Leokwe when Leopard’s Kopje people first moved into the valley. This contact represents the first ethnic stratification during the Iron Age in southern Africa. The new dates and ceramic analyses show that this relative status started at the beginning of contact, contra some interpretations. Although under the political authority of K2, Leokwe people maintained their own material-culture signature for several decades. It is common in such situations for earlier people to assume ritual roles: this gives them respect but not political power. Among other tasks, Leokwe people probably supervised the initiation school at Schroda.

Besides ritual specialists, Leokwe people appear to have herded cattle for K2 elite, as several Leokwe settlements have ‘extra’ kraals. A large Leokwe complex (2229AB223/224) inside the National Park yielded a mid- to late-11th century date from the main midden (IT-C-733), placing it in the mid-K2 phase.

Universally, states tend to subsume ethnic differences in favour of a national identity. In this regard, a few Leokwe vessels occur in K2 and TK2 sites (presumably through marriage alliances), but not in Mapungubwe. A national identity thus appears to have replaced ethnic differences by the early-13th century when large-scale centralised authority was established, but before sacred leadership had fully materialised.

Population dynamics

As the state grew, so did populations. For population estimates, we need accurate spans for each facies. Until now, the boundary between K2 and TK2 has been unclear. Carbonised seeds from Den Staat 14C (IT-C-671), along with dates from Liz198 (IT-C-1500, IT-C-2033, IT-C-2034 and IT-C-1498) together show that K2 ceramics transformed into TK2 around AD 1150. TK2 in turn became Mapungubwe about 120 years later, while Mapungubwe pottery lasted for about 50 years.

Using these new time spans, we assign 50 people (half of them adults) to each homestead, based on the Middle Iron Age burials at Kgaswe (Schroda, K2 and Mapungubwe). It is likely, however, that K2 started as a small capital before reaching its maximum extent. We thus present the first accurate spans for each facies. Until now, the boundary between Staat Mixed and Staat Post has been unclear.
Table 2: Population dynamics for the South African portion of the Shashe-Limpopo valley

| Phase          | Homesteads | Time span | General population | Capital | Total  |
|----------------|------------|-----------|--------------------|---------|--------|
| Mapungubwe     | 114        | 50        | 5700               | 5000    | 10 700 |
| AD 1270–1320   |            |           |                    |         |        |
| Transitional   | 143        | 120       | 2979               | 2500    | 5479   |
| AD 1150–1270   |            |           |                    |         |        |
| K2             | 153        | 25        | 2550               | 1275    | 1500   |
| AD 1000–1150   |            |           |                    | 300     | 1575   |
| Leokwe         | 63         | 200       | 787                | none    | 787    |
| AD 1000–1200   |            |           |                    |         |        |
| Zhizo          | 22         | 100       | 550                | 300     | 850    |
| AD 900–1000    |            |           |                    |         |        |

Number of sites ÷ 50 years x 50 people

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Droughts and abandonment

Rainfall affected political stability as well as agricultural production. We know that some farmers burnt their grainbins as a ritual of cleansing related to severe drought (3–5 years in a row). We first used the traditional radiocarbon method to date the burnings and droughts but fluctuations in the calibration curve confounded the results. We later added detailed baobab data (based on the isotopic component of successive growth rings) that eliminate the multiple choices in the calibration curves. These data reveal a few droughts not previously noted (Table 3). One drought (Group IX) in particular contributed to the abandonment of Mapungubwe. The baobab sequence dates this important episode somewhat later than expected, to about AD 1310±5.

Following the principles of sacred leadership, the leader’s right to rule would have been questioned as a result of this drought. With Mapungubwe leadership in turmoil, Great Zimbabwe was able to seize control of the gold belt, the most important source of trade wealth, and Great Zimbabwe became the new centre of power. Thus, the 14th-century drought was an indirect cause of Mapungubwe’s abandonment.

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Table 3: Baobab climatic sequence and severe droughts recognised in the archaeological record

| Group   | Cal AD  | Baobab cal AD |
|---------|---------|---------------|
| XIIIb   | 1660±5  |                |
| XIIIa   | 1650    | 1635±5        |
| XII     | 1530    | 1530±10       |
| XI      | 1440–1450| 1465±5        |
| X       | 1350–1400| 1390±10       |
| IX      | 1300    | 1310±5        |
| VIIIb   | 1285±5  |               |
| VIII    | 1200–1250| 1208, 1226, 1256|
| VIIIa   | 1185±10 |               |
| VII     | 1020–1070|               |
| VI      | 900–1000| (Two episodes)|
Dates from Wepe508 (IT-C-785, BP 650±52; and Pta-9549, BP 630±70) show that Mapungubwe people remained in the valley until about AD 1320 – the same date as the drought.

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Competing interests

We have no competing interests to declare.

Authors’ contributions

T.N.H. directed the field work and S.W. the AMS dating. Both authors prepared the manuscript.

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